



**The Fourth TCU International e-Learning Conference**

# **“Smart Innovations in Education & Lifelong Learning”**

**June 14-15, 2012**

**Hall 9, IMPACT, Muang Thong Thani, Nonthaburi, Thailand**



**Office of the Higher Education Commission,  
Thailand Cyber University Project**

**The Proceedings of  
International e-Learning Conference 2012  
(IEC2012)**

“Smart Innovations in Education and  
Lifelong Learning”

June 14-15, 2012  
IMPACT, Muang Thong Thani, Thailand





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# CONFERENCE OVERVIEW

- **TITLE**
  - International e-Learning Conference 2012
- **SHORT TITLE**
  - IEC2012
- **ORGANIZERS**
  - Thailand Cyber University Project, Office of the Higher Education Commission, Ministry of Education (Thailand)
- **DATE**
  - June 14-15, 2012
- **VENUE**
  - Convention Center, Hall 9, IMPACT, Muang Thong Thani, Thailand
- **CONFERENCE WEBSITE**
  - <http://www.thaicyberu.go.th/iec2012>
- **PARTICIPANTS:**
  - e-Learning decision makers, Government departments/agencies, Higher education institutions, Schools and Businesses in the e-Learning industry, Researchers, Students, and all who are interested in the topics from Thailand and overseas

## CONFERENCE INFORMATION

The Thailand Cyber University Project (TCU), Office of the Higher Education Commission, Ministry of Education (Thailand) has an aim to promote e-Learning by cooperating with national and international educational institutes. The TCU, recognizing the importance of e-Learning knowledge management to create comprehensive knowledge for educational personnel, has organized the **International e-Learning Conference 2012 (IEC2012)** : "Smart Innovations in Education and Lifelong Learning" The conference objective is to assemble knowledge on every aspect of e-Learning from Thai and international experts. Conference topics will include the quality and standard of learning management and evaluation, effective utilization and implementation of new technologies, understanding of new generation learners' behavior, and cost-effective and sustainable learning management.

The TCU will accumulate knowledge from the conference and produce the knowledge asset to be a reference for educators, researchers, faculty and students.

### AIMS

1. To be a stage for exchanging knowledge, innovative practices and experiences on e-Learning among Thai and international educators, researchers, faculty, and students.
2. To assemble knowledge on every aspect of e-Learning from Thai and international educators, researchers, and faculty and to create the e-Learning knowledge asset.
3. To expand e-Learning knowledge to educators, researchers, faculty, and students via website, journal, publication, etc.

### THEME

Smart Innovations in Education and Lifelong Learning



# International e-Learning Conference

June 14<sup>th</sup> -15<sup>th</sup>, 2012

Hall 9, IMPACT, Muang Thong Thani, Thailand

## CONFERENCE PROGRAM

### Thursday 14th June

|               |                                 |  |
|---------------|---------------------------------|--|
| 8.00 - 9.00   |                                 | Registration   |
|               | <i>MC: Mr.Chayawat Yodmanee</i> |  |
| 9.00 - 9.45   | Grand Diamond Ballroom          | <b>Welcome Address</b><br><i>Asst. Prof. Thapanee Thammetar, Ph.D.</i><br>Director, Thailand Cyber University Project, Thailand  |
|               |                                 | <b>Opening Address</b><br><i>Assoc. Prof. Kamjorn Tatiyakavee, M.D.</i><br>Deputy Secretary-General,<br>Office of the Higher Education Commission,<br>Ministry of Education, Thailand  |
| 9.45 - 10.45  | Grand Diamond Ballroom          | <b>Critical Issues in Smart Innovations</b><br><i>Prof. Dae Joon Hwang, Ph.D.</i><br><i>Secretary-General of the Korean Council for University Education</i><br><i>Professor of School of Information and Communication Engineering, Sungkyunkwan University, Republic of Korea</i>        |
| 10.45 - 11.00 |                                 | Refreshment  |
| 11.00 - 12.00 | Grand Diamond Ballroom          | <b>Using Open Education Resources Today : Empowering Your Teaching and Your Students Learning with MERLOT</b><br><i>Gerard L. Hanley, Ph.D.</i><br><i>Senior Director, Academic Technology Services</i><br><i>Executive Director, MERLOT</i><br>California State University, United States |
| 12.00 - 13.30 |                                 | Lunch  |

## Thursday 14th June

| 13.30-14.50       | Venue           |  |
|-------------------|-----------------|--|
| <b>Session A1</b> | Sapphire Room 1 | <b>Chairperson: <i>Mr. Buncha Samruayruen</i></b><br>Pibulsongkram Rajabhat University, Thailand   |
| A1                |                 | <b>The Effectiveness of learning from video clips: Case-Study on Moodle Learning Management System</b><br><i>Phurithat Singhasem</i><br><i>Jeuajan Wattakiecharoen</i><br>Christian University, Thailand<br><i>Prachyanun Nilsook</i><br>King Mongkut's University of Technology North Bangkok, Thailand |
| A2                |                 | <b>Formulate Social Media into Media Information Literacy</b><br><i>Yoshida Masami</i><br>Chiba University, Japan  |
| A3                |                 | <b>Electronic Intelligent Cyber Classroom (e-ICC) using Face Tracking together with Environment Recognition</b><br><i>Khammapun Khantanapoka</i><br>Chandrakasem Rajabhat University, Thailand   |
| A4                |                 | <b>Strategies to Improve Query Processing Time in Searching Membership Queries of Virtual Classroom by Using DBIC</b><br><i>Weahason Weahama</i><br>Prince of Songkhla University, Thailand  |
| <b>Session B</b>  | Sapphire Room 2 | <b>Chairperson: <i>Dr. Anirut Satiman</i></b><br>Silpakorn University, Thailand  |
| B1                |                 | <b>Location Based mobile learning in Singapore Schools</b><br><i>Shawnz Neo</i><br>CodesPorter Ltd, Thailand   |
| B2                |                 | <b>Edmodo: A User-Friendly Social Learning Platform</b><br><i>Chada Kongchan</i><br>King Mongkut's University of Technology Thonburi, Thailand   |
| B3                |                 | <b>Smart e-Learning through Media and Information Literacy</b><br><i>Sara Gabai</i><br><i>Susanne Ornager</i><br>UNESCO, Thailand  |
| B4                |                 | <b>Developing Multiliteracy Skills in e-Learning Environments using Tablet Computers at the Primary Grade Level in Thailand</b><br><i>Willard Van De Bogart</i><br>Bangkok University, Thailand  |

| 13.30-14.50      | Venue           |  |
|------------------|-----------------|--|
| <b>Session C</b> | Sapphire Room 3 | <b>Chairperson: Prof. Howard Combs, Ph.D.</b><br>San Jose State University, United States  |
| C1               |                 | <b>A Platform for Learning Parallel Programming with Graphic Processors</b><br><b>Saber Adavi</b><br>Amirkabir University of Technology (Tehran Polytechnic), Iran<br><b>Parichehr Razmand</b><br>Indiana University Bloomington, USA  |
| C2               |                 | <b>When Science General Education Courses Meet Facebook</b><br><b>Hao-Chang Lo</b><br>National Kaohsiung Normal University, Taiwan<br><b>Chia-Hung Lin</b><br><b>Hsiu-Yu Chen</b><br>National Taichung University of Education, Taiwan |
| C3               |                 | <b>Automatic Link Generation for Search Engine Optimization</b><br><b>Reyner D'souza</b><br><b>Apurva Kulkarni</b><br><b>Imran Ali Mirza</b><br>Don Bosco Institute of Technology, Kurla   |
| C4               |                 | <b>MSN Messenger in Reading Class: How does it Promote Content Schemata and Reading Comprehension?</b><br><b>Zola Chi-Chin Lai</b><br>National Cheng Kung University, Taiwan   |
| <b>Session D</b> | Sapphire Room 4 | <b>Chairperson: Dr. Nammon Ruangrit</b><br>Silpakorn University, Thailand  |
| D1               |                 | <b>Mind Map Based Semantic Web Browser for Tablets</b><br><b>Julthep Nandakwang</b><br><b>Prabhas Chongstitvatana</b><br>Chulalongkorn University, Thailand  |
| D2               |                 | <b>A Development of an e-Learning Competency-based English CourseModule for Chief Flight Attendants</b><br><b>Anothai Dibakanaka</b><br>Chulalongkorn University, Thailand   |
| D3               |                 | <b>Enhanced e-Learning Toward Near Reality Virtual Classroom</b><br><b>Prapai Sridama</b><br>Bansomdejchaopraya Rajabhat University, Thailand<br><b>Witt Khantilert</b><br>Mentorsoft Co., Ltd., Thailand                              |

| 13.30-14.50      | Venue           |  |
|------------------|-----------------|--|
| D4               |                 | <p><b>Implementation of anonymity learning concept in Higher Education e-Learning system: a case study of Suan Sunandha Rajabhat University's Computer Science subject</b></p> <p><i>Phanu Waraporn</i><br/>Suan Sunandha Rajabhat University, Thailand</p>  |
| <b>Session E</b> | Sapphire Room 5 | <p><b>Chairperson: <i>Mr. Vachira Jantarach</i></b><br/>Silpakorn University, Thailand</p>   |
| E1               |                 | <p><b>The Development of Composite Indicators of Success ICT in Teaching and Learning for Promoting ICT Literacy Skills of Secondary School Student</b></p> <p><i>Chorboon Chiranuparp</i><br/>Office of the Educational Council, Thailand</p> <p><i>Praweenya Suwannatthachote</i><br/><i>Nongluck Wiratchai</i><br/>Chulalongkorn University, Thailand</p> |
| E2               |                 | <p><b>An Ecological Approach to Using Ubiquitous Handheld Devices in the Classroom</b></p> <p><i>Dorota Domalewska</i><br/>Stamford International University, Thailand</p>   |
| E3               |                 | <p><b>Promoting Undergraduate Students' Learning Achievement and Self-Regulated Learning Skills in Blended Learning Environments</b></p> <p><i>Nootjaree Boonget</i><br/><i>Praweenya Suwannatthachote</i><br/><i>Sugree Rodpothong</i><br/>Chulalongkorn University, Thailand</p>   |
| E4               |                 | <p><b>Logged on to Learning: Internet and Life Long Learning (LLL)</b></p> <p><i>Kuldeep Nagi</i><br/>Assumption University, Thailand</p>  |
| <b>Session F</b> | Sapphire Room 6 | <p><b>Chairperson: <i>Dr. Theeravadee Thangkabutra</i></b><br/>Chulalongkorn University, Thailand</p>  |
| F1               |                 | <p><b>Development of Pedagogical Blended e-Learning Model with Cognitive Tools to Enhance Knowledge Construction in Higher Education Learners</b></p> <p><i>Jintavee Khlaisang</i><br/>Chulalongkorn University, Thailand</p>  |

| 13.30-14.50      | Venue           |   |
|------------------|-----------------|---|
| F2               |                 | <p><b>Internet and Computer Competency-Based Curriculum for Thai People Under the MICT Certification</b><br/> <b><i>Matuross Chongchaikit</i></b><br/>                     Kasetsart University, Thailand</p>   |
| F3               |                 | <p><b>Agile Project Management for Smart m-learning</b><br/> <b><i>Annop Piyasinchart</i></b><br/> <b><i>Namon Jeerungsuwan</i></b><br/>                     King Mongkut’s University of Technology North Bangkok, Thailand</p>  |
| F4               |                 | <p><b>Assessment Approaches for Online Learning Environments: Lessons learned from blended and online courses</b><br/> <b><i>Praweenya Suwannatthachote</i></b><br/>                     Chulalongkorn University, Thailand<br/> <b><i>Anirut Satiman</i></b><br/>                     Silpakorn University, Thailand</p> |
| 14.50-15.05      | Refreshment     |   |
| 15.05-16.25      | Venue           |   |
| <b>Session A</b> | Sapphire Room 1 |   |
| A5               |                 | <p><b>Compiler on the Web: Remote Laboratory for e-Learning</b><br/> <b><i>Nikorn Manus</i></b><br/>                     Chulalongkorn University, Thailand</p>   |
| A6               |                 | <p><b>A Development Soft K-Library Engine Programming of mathematics Model and physical computation for Create Three-Dimensional in e-Training Simulation</b><br/> <b><i>Khammapun Khantanapoka</i></b><br/>                     Chandrakasem Rajabhat University, Thailand</p>   |
| A7               |                 | <p><b>Innovation of Knowledge-base Hyper-multimedia to Promote a Culture of Using ICT Creatively for Adolescents</b><br/> <b><i>Chutipuk Kemwimuttiwong</i></b><br/>                     Chiang Mai Rajabhat University, Thailand</p>   |
| A8               |                 | <p><b>Transition an e-Teacher Portfolio in Empowering the Role of Lifelong Learning</b><br/> <b><i>Patcharin Kanhkha</i></b><br/>                     Rajamangala University of Technology Srivijaya , Thailand</p>   |



| 15.05-16.25      | Venue           |  |
|------------------|-----------------|--|
| <b>Session B</b> | Sapphire Room 2 |  |
| B5               |                 | <p><b>A Remote Automatic Control Laboratory via a Network</b><br/> <i>Chaiyapon Thongchaisuratkrul</i><br/> <i>Manop Hangpai</i><br/>                     King Mongkut's University of Technology North Bangkok, Thailand</p>  |
| B6               |                 | <p><b>Using Weblog for Innovative Teaching in Higher Education</b><br/> <i>Rossukhon Makaramani</i><br/>                     Suan Sunandha Rajabhat University, Thailand</p>   |
| B7               |                 | <p><b>Blended Discrete Trial Clinical Method to Enhance Performance in eLearning Mathematics Courses</b> <i>Rajasegeran Ramasamy</i><br/>                     Albukhary International University, Malaysia<br/> <i>Hanafi b Atan</i><br/> <i>Omar Majid</i><br/>                     Universiti Sains Malaysia, Malaysia</p> |
| B8               |                 | <p><b>EFL Students' Writing English News Articles on Blogs</b><br/> <i>Patcharee Muangnakin</i><br/> <i>Ampapan Tantinakornkul</i><br/>                     King Mongkut's Institute of Technology Ladkrabang, Thailand</p>  |
| <b>Session C</b> | Sapphire Room 3 |  |
| C5               |                 | <p><b>Interactive Media for Edu-Infotainment: e-Radio for e-Learning</b><br/> <i>Najam Abbas Naqvi</i><br/>                     Northwestern Polytechnical University, China<br/> <i>Rida Batool</i><br/> <i>Muhammad Adeel</i><br/>                     Institute of Space Technology, Pakistan</p>                         |
| C6               |                 | <p><b>Technological Tools to Learn and Teach Mathematics and Statistics</b><br/> <i>Mujo Mesanovic</i><br/>                     American University of Sharjah, United Arab Emirates</p>   |
| C7               |                 | <p><b>The Introduction of Mobile Learning in Mathematics for First Year B.Sc.I.T.) Students : A Case Study. Institute of Distance and Open Learning (IDOL), University of Mumbai</b><br/> <i>Mandar Bhanushe</i><br/>                     University of Mumbai, India</p>  |
| C8               |                 | <p><b>Augmented Learning using Info-graphs in ELT and ESL Environments</b><br/> <i>Premanand Edward Malyakkal</i><br/>                     Calicut University, India</p>   |

| 15.05-16.25      | Venue           |  |
|------------------|-----------------|--|
| <b>Session D</b> | Sapphire Room 4 |  |
| D5               |                 | <p><b>Adaptive web-based cognitive and motivational scaffoldings:<br/>A systematic view of regulation of learning</b><br/><i>Ching-Huei Chen</i><br/><i>I-Chia Wu</i><br/>National Changhua University of Education, Taiwan</p>  |
| D6               |                 | <p><b>Social Network: A Tool for Learning Oral Presentation</b><br/><i>Thulasimani Munohsamy</i><br/>Institut Teknologi Brunei, Brunei</p>   |
| D7               |                 | <p><b>Effects of an online learning Using cooperative activity on achievement<br/>In seminar course, graduate nursing students</b><br/><i>Gunyardar Prachusilpa</i><br/>Chulalongkorn University, Thailand</p>   |
| D8               |                 | <p><b>Critical Thinking Solution via LAMS to Support Research Paper Writing</b><br/><i>Kongkiat Hirankerd</i><br/><i>Jaitip Na-Songkhla</i><br/>Chulalongkorn University, Thailand</p>   |
| <b>Session E</b> | Sapphire Room 5 |  |
| E5               |                 | <p><b>A development Management Information Systems via Online for<br/>Institute for Scientific and Technological Research and Services (ISTRS)<br/>King Mongkut's University of Technology Thonburi</b><br/><i>Chaloemwut Jantopas</i><br/><i>Suwanna Sombunsukho</i><br/><i>Nithi Buranajant</i><br/>King Mongkut's University of Technology Thonburi, Thailand</p> |
| E6               |                 | <p><b>Evolution of Courseware Production at the College of Internet<br/>Distance Education at Assumption University</b><br/><i>Firouz B. Anaraki</i><br/>Assumption University, Thailand</p>   |
| E7               |                 | <p><b>Development of Blended e-Learning Model Using Online Interactive<br/>Reflective Learning Logs to Enhance Faculty of Education Students'<br/>Inquiring Mind and Retention at Chulalongkorn University</b><br/><i>Jintavee Khlaisang</i><br/><i>Prakob Koraneekij</i><br/>Chulalongkorn University, Thailand<br/>Assumption University, Thailand</p>             |

| 15.05-16.25 | Venue           |   |
|-------------|-----------------|---|
| E8          |                 | <p><b>Towards the e-Learning Excellence: Learners' satisfaction of the new e-Learning system at Sripatum University, Thailand</b><br/> <b><i>Vorasuang Duangchinda</i></b><br/> <b><i>Nittha Chamniyont</i></b><br/>                     Sripatum University, Thailand</p>  |
| 15.05-16.45 | Venue           |   |
| Session F   | Sapphire Room 6 |   |
| F5          |                 | <p><b>Development of On-line Instruction Media and Administration System based on Moodle Program on Learning Behaviors of PhD. Students</b><br/> <b><i>Jeuajan Wattakiecharoen</i></b><br/>                     Christian University, Thailand<br/> <b><i>Prachyanun Nilsook</i></b><br/>                     King Mongkut's University of Technology North Bangkok, Thailand</p> |
| F6          |                 | <p><b>The INFINITY Learning Model in Thailand: Its Potential for Developing Countries</b><br/> <b><i>Poonsri Vate-U-Lan</i></b><br/>                     Assumption University, Thailand</p>  |
| F7          |                 | <p><b>The Integration of e – Learning and Application of Moodle program in Graduate Nursing Program</b><br/> <b><i>Nongpimol Nimit - arnun</i></b><br/>                     Christian University, Thailand</p>  |
| F8          |                 | <p><b>Effect of e-Learning Using Collaborative Learning via Social Media on Competency of Using Information and Communication Technology of Undergraduate Educational Students</b><br/> <b><i>Thepphayaphong Setkhumbong</i></b><br/>                     Silpakorn University, Thailand</p>  |
| F9          |                 | <p><b>A Study of Interest using Internet in Learning Activities of Basic Non-formal Education Learners</b><br/> <b><i>Sudarat Intarat</i></b><br/> <b><i>Sumalee Chanchalor</i></b><br/>                     King Mongkut's University of Technology Thonburi, Thailand</p>   |



# International e-Learning Conference

June 14<sup>th</sup> -15<sup>th</sup> , 2012

Hall 9, IMPACT, Muang Thong Thani,Thailand

## CONFERENCE PROGRAM

### Friday 15th June

|                      |  |  |
|----------------------|--|--|
| <b>8.30 - 9.30</b>   |  | <b>Registration</b>  |
|                      | <b>MC:</b> <i>Mr.Chayawat Yodmanee</i> |  |
| <b>9.30-10.20</b>    | Grand Diamond Ballroom                 | <b>Using Smart Innovations to Foster Creativity, Cooperation, and Lifelong Learning</b><br><b>David Roberts</b><br><i>Principal Associate</i><br>Wentworth Jones Associates, United Kingdom  |
| <b>10.20 - 10.35</b> |  | <b>Refreshment</b>   |
| <b>10.35-11.30</b>   | Grand Diamond Ballroom                 | <b>A Cyber Future For Education : Dilemma of Promise and Despair</b><br><b>Tan Sri Dato Emeritus Professor Gajaraj Dhanarajan, Ph.D.</b><br><i>Chairman, Board of Governors,</i><br>Wawasan Open University, Penang, Malaysia                            |
| <b>11.30-12.20</b>   |  | <b>Managing Digital Content Development: An experience from Mexico</b><br><b>Prof. Juan José Contreras Castillo, Ph.D.</b><br><i>Director, Department of Lifelong and Distance Learning in the Autonomous</i><br>University of the Mexican State, Mexico |
| <b>12.20 - 13.30</b> |  | <b>Lunch</b>   |

## Friday 15th June

| 13.30-14.50      | Venue           |   |
|------------------|-----------------|---|
| <b>Session A</b> | Sapphire Room 1 | <p><b>Chairperson: <i>Mr. Buncha Samruayruen</i></b><br/>Pibulsongkram Rajabhat University, Thailand</p>  |
| A1               |                 | <p><b>The Development of Online Instructional Media on Information Technology for Learning</b><br/><i>Pensri Srisawat</i><br/>Institute of Physical Education Suphanburi Campus, Thailand</p>   |
| A2               |                 | <p><b>Blended e-Learning Activities for the Information and Innovation Management Course: Its Outcomes of Graduate Students'</b><br/><b>Bangkok-Thonburi University</b><br/><i>Prachyanun Nilsook</i><br/><i>Panita Wannapiroon</i><br/>King Mongkut's University of Technology North Bangkok, Thailand</p> |
| A3               |                 | <p><b>The development of learning management system in higher education level</b><br/><i>Puvadon Buabangplu</i><br/>Rajamangala University of Technology Tawan-ok, Thailand</p>   |
| A4               |                 | <p><b>The Development of an Electronic Training Program on Research for Learning Development for Science Learning Area Teachers at the Elementary Education Level</b><br/><i>Rabiab Sittichai</i><br/>Sukhothai Tummatirad Open University, Thailand</p>  |
| <b>Session B</b> | Sapphire Room 2 | <p><b>Chairperson: <i>Dr. Pornsook Tantrarungroj</i></b><br/>Chulalongkorn University, Thailand</p>   |
| B1               |                 | <p><b>Learning Management Systems of Mathematics Course by Moodle</b><br/><i>Sunisa Saiuparad</i><br/><i>Yoothaphong Simuang</i><br/>Siam Technology College, Thailand</p>  |
| B2               |                 | <p><b>Developing Science Teachers' Understanding Nature of Science through New York Time's Scientist at Work Science Blogs</b><br/><i>Pongprapan Pongsophon</i><br/>Kasetsart University, Thailand</p>  |
| B3               |                 | <p><b>Web-based Supplementary Learning in Breast Screening</b><br/><i>Kulachai Kultawanich</i><br/>Chulalongkorn University, Thailand</p>   |
| B4               |                 | <p><b>Flexible Learning Materials in e-Learning</b><br/><i>Lilibeth Francisco Taa</i><br/>SEAMEO INNOTECH, Philippines</p>  |

| 13.30-14.50      | Venue           |   |
|------------------|-----------------|---|
| <b>Session C</b> | Sapphire Room 3 | <b>Chairperson: Asst. Prof. Praweenya Suwannatthachote, Ph.D.</b><br>Chulalongkorn University, Thailand   |
| C1               |                 | <b>A Strategy for e-Training in Information Technology Security</b><br><i>Jira Jitsupa</i><br><i>Prachyanun Nilsook</i><br><i>Pallop Piriyasurawong</i><br>King's Mongkut University of Technology North Bangkok, Thailand  |
| C2               |                 | <b>The Effect of Research-Based Blended Learning approach with Peer Assisted Learning Strategy Model on the Scientific Mind of Students: Case Study on Information Technology for Learning Course, Institute of Physical Education Chumphon Campus</b><br><i>Narumon Rodniam</i><br>Institute of Physical Education Chumphon Campus, Thailand |
| C3               |                 | <b>Peer and Teacher Correction Techniques: Using e-Tool to Correct Writing</b><br><i>Songsri Soranastaporn</i><br><i>Thanayus Thanathiti</i><br>Mahidol University, Thailand  |
| C4               |                 | <b>AAS : Algorithm Analysis Service for Computer Science e-Learning</b><br><i>Tanin Krajangthong</i><br><i>Somchai Prasitjutrakul</i><br>Chulalongkorn University, Thailand   |
| <b>Session D</b> | Sapphire Room 4 | <b>Chairperson: Mr. Vorasuang Duangchinda</b><br>Sripatum University, Thailand  |
| D1               |                 | <b>Effects of blended learning in a Web 2.0 Technologies in Digital library and Information for Research</b><br><i>Phisit Suvarnaphaet</i><br><i>Sapsiri Khumthongmak</i><br>Silpakorn University, Thailand<br><i>Bhutharit Vittayaphattananurak Raksasiri</i><br><i>Sarada Jarupan</i><br>Rajamangala Tawan-Ok, Thailand                     |
| D2               |                 | <b>The Relationship between Achievement Goal Orientation and Self-Directed Learning Readiness in e-Learning Environment</b><br><i>Alisa Songsriwittaya</i><br>King Mongkut's University of Technology Thonburi, Thailand  |

| 13.30-14.50      | Venue           |   |
|------------------|-----------------|---|
| D3               |                 | <p><b>A Guideline of Social Media Application for the Collaborative Learning in Higher Education</b><br/> <i>Thanayot Sirichodok</i><br/> <i>Rossukhon Makaramani</i><br/> <i>Wasana Sangpum</i><br/>                     Suan Sunandha Rajabhat University, Thailand</p> |
| D4               |                 | <p><b>Taking Australia’s premium MBA program online through blended learning</b><br/> <i>Pavle Jeric</i><br/>                     Macquarie University, Australia</p>   |
| <b>Session E</b> | Sapphire Room 5 | <p><b>Chairperson: Assoc. Prof. Maturros Chongchaikit, Ph.D.</b><br/>                     Kasetsart University, Thailand</p>  |
| E1               |                 | <p><b>How to Incorporate Content and Academic Vocabulary of Psychology into On-Line and Off-Line Graded Self-Learning Materials Development</b><br/> <i>Helen Hendaria Kamandhari</i><br/>                     The University of Surabaya, Indonesia</p>                  |
| E2               |                 | <p><b>e-Learning Sexual Health Program in Thai Adolescent</b><br/> <i>Usa Tantapong</i><br/> <i>Namfon Domklang</i><br/>                     Christain University, Thailand</p>   |
| E3               |                 | <p><b>Effective Evaluation for “Introduction to Computer Technology” Subject Base on Learning Management System (LMS)</b><br/> <i>Naruemon Saengduangkhae</i><br/>                     Rajamangala University of Technology Srivijaya, Thailand</p>                       |
| E4               |                 | <p><b>Bridging the Gap of ICT adoption in Business</b><br/> <i>Suwimon Vongsingthong</i><br/>                     Krirk University, Thailand</p>  |
| <b>Session F</b> | Sapphire Room 6 | <p><b>Chairperson: Asst. Prof. Jintavee Khlaisang, Ph.D.</b><br/>                     Chulalongkorn University, Thailand</p>  |
| F1               |                 | <p><b>Examining the areas of ICT utilization among school teachers and principals in Malaysia</b><br/> <i>Kazi Hoque</i><br/> <i>Mosa. Zohora</i><br/>                     University of Malaya, Malaysia</p>   |
| F2               |                 | <p><b>Prospect of e-Learning in context of University Laboratories</b><br/> <i>Chandresh Kumar Chhatlani</i><br/>                     JRN Rajasthan Vidyapeeth University, India</p>  |

| 13.30-14.50      | Venue              |   |
|------------------|--------------------|---|
| F3               |                    | <p><b>Comparison of Learning Achievement in Mathematics 2 between Traditional Learning and E-Learning through Online Study</b><br/> <i>Kosum Chansaengkrachang</i><br/>                     Siam Technology College, Thailand</p>   |
| F4               |                    | <p><b>21st Century Skills of Undergraduate Students in Science and Technology : An Information Literacy Assessment</b><br/> <i>Hathairat Kunakornsakul</i><br/> <i>Pichet Pinit</i><br/>                     King Mongkut's University of Technology Thonburi, Thailand</p>   |
| 14.50-15.05      | <b>Refreshment</b> |   |
| 15.05-16.25      | Venue              |   |
| <b>Session A</b> | Sapphire Room 1    |   |
| A5               |                    | <p><b>English Composition Game on the computer using a Natural language Processing through online learning</b><br/> <i>Suriyong Lertkulvanich</i><br/> <i>Parinya Punpongsanon</i><br/>                     King Mongkut's University of Technology Thonburi, Thailand</p>    |
| A6               |                    | <p><b>Realism versus schematic representation</b><br/> <i>Mucahit Camnalbur</i><br/>                     Istanbul Provincial Directorate for National Education, Turkey</p>   |
| A7               |                    | <p><b>The Implementation of Online Tutorial in Abstract Algebra Course and Pre-Service Teachers' Perceptions toward Their Academic Achievement</b><br/> <i>Synta Candyia L.</i><br/>                     Sampoerna School of Education, Indonesia</p>                         |
| A8               |                    | <p><b>The Development of a Learning Model through the Royal Thai Air Force Wide Area Network Using the Constructionism for Aircraft Mechanics</b><br/> <i>Surin Cortong</i><br/> <i>Saroch Sopeerak</i><br/>                     Phranakhon Rajabhat University, Thailand</p> |
| <b>Session B</b> | Sapphire Room 2    |   |
| B5               |                    | <p><b>Development of e-Learning Instructional Materials for the ICNS152 Southeast Asia Ecology Course</b><br/> <i>Ramesh Boonratana</i><br/>                     Mahidol University International College, Thailand</p>   |



| 15.05-16.25 | Venue           |  |
|-------------|-----------------|--|
| B6          |                 | <p><b>e-Learning Courseware Prototype for Information Literacy Competency Development of Undergraduate Students</b><br/> <b><i>Sakda Chanprasert</i></b><br/>                     Khon Kaen University, Thailand</p>   |
| B7          |                 | <p><b>An e-Learning Facilities Developing Framework</b><br/> <b><i>Wanwipa Titthasiri</i></b><br/>                     Rangsit University, Thailand</p>  |
| B8          |                 | <p><b>Multiple Group Structural Equation Modeling Development for Factor Analysis that effects Information Technology Service Management of Higher Educational Academic Institutions</b><br/> <b><i>Sarun Nakthanom</i></b><br/>                     Bangkok Suvarnabhumi College, Thailand<br/> <b><i>Namon Jeerungsuwan</i></b><br/>                     King Mongkut's University of Technology North Bangkok, Thailand</p> |
| Session C   | Sapphire Room 3 |  |
| C5          |                 | <p><b>High Artificial Intelligent in e-Learning for the blind and deaf using Thai Speech Recognition Together with Lip-Hand Language Pattern Synthesis</b><br/> <b><i>Khammapun Khantanapoka</i></b><br/>                     Chandrakasem Rajabhat University, Thailand</p>   |
| C6          |                 | <p><b>Using Online Scenario-Based Learning in Database Design Subject</b><br/> <b><i>Saisunee Jabjone</i></b><br/>                     Nakhonratchasima Rajabhat University, Thailand</p>  |
| C7          |                 | <p><b>e-Learning games: A powerful learning environment – Principles and examples</b><br/> <b><i>David Crookall</i></b><br/>                     University de Nice Sophia Antipolis, France</p>   |
| C8          |                 | <p><b>The Investigation of Remote Advising on Independent Study/Thesis Work for Students in e-Learning Mode: A Case Study of Faculty and Students in Graduate Level e-Learning Programs</b><br/> <b><i>Satha Phongsatha</i></b><br/>                     Assumption University, Thailand</p>   |

| 15.05-16.25      | Venue           |  |
|------------------|-----------------|--|
| <b>Session D</b> | Sapphire Room 4 |  |
| D5               |                 | <p><b>Comparison of Learning Achievement on Circuit Analysis by Mesh Current Method via the Internet between Different Feedbacks</b><br/> <i>Preeyapus Phooljan</i><br/> <i>Sumalee Chanchalor</i><br/>                     King Mongkut’s University of Technology Thonburi, Thailand</p>   |
| D6               |                 | <p><b>Enhance motivation in online knowledge sharing: how to adapt social networking and web applications as scrapbook concept for digital storytelling</b><br/> <i>Piyapot Tantaphalin</i><br/>                     Chulalongkorn University, Thailand</p>  |
| D7               |                 | <p><b>Examining Online EFL Learners Learning Preference: Interaction as an Essential Component</b><br/> <i>Lynn Ann Deocampo</i><br/>                     Mindanao State University-Iligan Institute of Technology, Philippines</p>  |
| D8               |                 | <p><b>Examining Trends of Game-Assisted Learning: Research Purposes and Methods</b><br/> <i>We-Hsiung Wu</i><br/>                     National Kaohsiung University of Applied Sciences, Taiwan<br/> <i>Hao-Yun Kao</i><br/>                     Kaohsiung Medial University, Taiwan<br/> <i>Chung-Hsing Alex Hu</i><br/>                     Meiho University, Taiwan</p> |
| <b>Session E</b> | Sapphire Room 5 |  |
| E5               |                 | <p><b>Usage Demand of the e-Lecture for Reviewing Lessons of MUIC Students</b><br/> <i>Thammachart Kanjanapinyo</i><br/> <i>Chayanon Poonthongb</i><br/> <i>Yubol Boonjaranb</i><br/>                     Mahidol University, Thailand</p>   |
| E6               |                 | <p><b>Students’ Perceptions towards Learning Experiences, Curriculum and Satisfaction of an e-Learning Program: A Case Study of an International e-Learning Program offered in Thai Institution</b><br/> <i>Thanawan Phongsatha</i><br/>                     Assumption University, Thailand</p>   |
| E7               |                 | <p><b>Awareness of Internet Plagiarism among the Secondary School Students of SMK Sungai Pusu, Gombak, Malaysia</b><br/> <i>Rajiah Hasan</i><br/>                     International Islamic University, Malaysia</p>   |

| 15.05-16.25      | Venue           |   |
|------------------|-----------------|---|
| E8               |                 | <p><b>Impact of Web 2.0 Technology on the Scientific Literacy of Animal Sciences and Agricultural Technology Students Concerning Strengthened Greenhouse Effect / Global Climatic Change and Ozone Depletion</b><br/> <i>Phisit Suvarnaphaet</i><br/> <i>Sapsiri Khumthongmak</i><br/>                     Silpakorn University, Thailand</p> |
| <b>Session F</b> | Sapphire Room 6 |   |
| F5               |                 | <p><b>Attention Deficit Hyperactivity Disorder (ADHD) Student Classification Using Genetic Algorithm and Artificial Neural Network</b><br/> <i>Sasikanchana Yenaeng</i><br/> <i>Somkid Saelee</i><br/> <i>Soradech Krootjohn</i><br/>                     King Mongkut's University of Technology North Bangkok, Thailand</p>                 |
| F6               |                 | <p><b>Model of Knowledge Management Processes Learning in a Form e-Learning</b><br/> <i>Inthira Paleenud</i><br/>                     King Mongkut's University of Technology Thonburi, Thailand</p>  |
| F7               |                 | <p><b>Attitudes of Thai EFL Learners toward the Use of Blogs</b><br/> <i>Pongthorn Asawaniwed</i><br/> <i>Atipat Boonmoh</i><br/>                     King Mongkut's University of Technology Thonburi, Thailand</p>  |
| F8               |                 | <p><b>E-learning framework based on Social Network</b><br/> <i>Pagon Gatchalee</i><br/>                     Beihang University, Beijing</p>   |





**IEC2012  
PAPER  
ABSTRACTS**

Keynote Speakers



## Critical Issues of Smart Education

**Dae Joon Hwang, Ph.D.**

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### Abstract

Innovation in smart learning emerged as a new paradigm for sustainable growth in digital knowledge economy in Korea. Now the term '*smart*' has been used to explain substantial differences between traditional approaches and new ones taken to improve or enhance quality of business, manufacturing, administration, education/learning and service.

In this talk, general issues of innovation in smart learning will be discovered based on context and followed by further discussions on specific issues of smart education. Before implementing innovation based on their context we need to thoroughly understand where we are and where to move on. With these in mind we're asked to find what solutions are feasible to implement such a smart innovation and then come to find optimal ones. The process of innovation in smart learning seems to be quite similar to those taken by six sigma approaches in management science. In this regard, smart education can be understood as the process of innovating the context of education from the point of what education is about to what education should be. We also show how to assess the process of innovation from As-Is to To-Be, the goal of innovation.

Practices of smart education within different context will be presented into the slides for helping you understand how smart innovation can be consistently implemented within their own context. We figure out critical issues in smart education which includes digital pedagogy for "Media (or Y) Generation", understanding learner's behavior, harnessing technology, open access to educational resources and their fair use, administration, and educational curriculum. I hope I will give a thought-provoking talk.

## **Using smart innovations to foster creativity, cooperation, and lifelong learning: the case of the Royal Commonwealth Society Jubilee Time Capsule**

**David C Roberts MBA, Dip IoD**

*Principal Wentworth Jones Associates  
Manchester, United Kingdom.*

*Associate lecturer Manchester Business School, Manchester, United Kingdom,  
david@wentworthjones.com*

This key note presentation shares with conference a practical working example from the United Kingdom of how the Royal Commonwealth Society supported by Capsool Ltd have created a shared learning experienced across the globe. The presentation demonstrates an example of e-learning crossing the boundaries of formal, non-formal, and informal learning.

The Royal Commonwealth Society (RCS) is an education charity with a wide portfolio of projects which seek to engage young people in global affairs and develop their skills through a number of different schemes. The RCS has a strong relationship with schools, a branch network across the UK and the world, a Royal Charter, and Her Majesty Queen Elizabeth II as patron.

For over a century, the RCS has communicated with schools, universities and young people to engage them in issues and to develop their skills in leadership, writing, film making, photography, advocacy, public speaking, political literacy, communication and volunteering. The vision of the RCS is to promote international understanding through our membership, educational programs, events and publications, thereby helping to raise the profile and value of the modern Commonwealth.

The Jubilee Time Capsule is an online time capsule that gives people across the globe the chance to create a digital Diamond Jubilee gift for Her Majesty Queen Elizabeth II. People are invited to select a memorable day for them between 6 February 1952 and 6 June 2012 and contribute videos, photos and text to explain why that day is important to them. This ambitious People's History will chart the last 60 years of Her Majesty's reign and Headship of the Commonwealth, creating a unique digital legacy this Diamond Jubilee year.

2012 is an important year for Great Britain and the Commonwealth as we celebrate the Diamond Jubilee of Her Majesty Queen Elizabeth II. The presentation shares the story of the Jubilee Time Capsule project [www.jubileetimecapsule.org](http://www.jubileetimecapsule.org).

The presentation shows how the project has helped enable school children, members of the general public, educational organizations, businesses, and even a Princess to engage in a innovative collaborative learning project, and also how the 'People's History' that is being created can be used as a catalyst for a variety of further learning activities.

### **Major Topics**

CO-CREATION, CO-OPERATION, INNOVATION, LIFE LONG LEARNING.

### **Keywords**

Catalyst, Creativity, E-learning, Europe, Innovation, Jubilee Time Capsule, Lifelong learning.



## **A CYBER FUTURE FOR EDUCATION: PROMISE AND DESPAIR**

**G. Dhanarajan**  
**Wawasan Open University**  
**Penang, Malaysia.**

### **Abstract**

The presentation considers cyber education in the context of the Higher Education milieu especially in the emerging economies of Asia including the two big giant nations in our neighbourhood viz. China and India.

The recognition that higher education is serves multiple purposes in a nations development has meant that investments in higher education has been growing at a phenomenal speed over the last two decades in our neighbourhood. This is not only in the size of the enrollment but also in the diversity of provision. Conventional providers such Universities, Colleges, Polytechnics and Academies have been growing along with parallel non-conventional systems like Open, Electronic, Cyber and Virtual Universities, Colleges and Institutes. While conventional systems have continued to serve the formal age cohort the non-conventional systems have broadened the catchment. At the same time the line between conventional and non-conventional systems has also begun to get thinner and new forms blending both types have begun to emerge.

Despite the extensive provisions and expansion of access there is still a big gap between the demand and supply of higher education on our continent.

Can Cyber education fill this gap effectively and efficiently? Its promise gives hope but the realities of life is such that such hope is also tempered with despair at the uncertainties of adequate knowledge, skills, infrastructure and supportive policy to enable Cyber education to serve its potential to the fullest.





# **IEC2012 FULL PAPER**

Paper Presentation



## **The Effectiveness of learning from video clips: Case-Study on Moodle Learning Management System**

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### **ABSTRACT**

**General Education Department is using Moodle LMS program (Learning Management System) in order to support Fundamental Psychology course activities. In this course, the lecturer designs for students to learn by watching video clips from the Moodle program. Students can learn more from video clips after class in order to enhance the students' understanding of the content. The objective of this research is to study the effectiveness of learning from video clips by using Moodle LMS program of undergrads and the satisfaction of students toward learning from video clips by using Moodle LMS program. There were 286 students registered in Fundamental Psychology in the first semester of the year 2011. The instrument was a questionnaire. The research found that learning from video clips allow students to understand Fundamental Psychology course more, and video clips with audio and animation allow students to remember the content easier. In addition the students have the satisfaction of learning from video clips by using Moodle LMS program at a very good level.**

### **Keywords**

Learning Management System, Moodle e-Learning, psychology e-Learning, video clips.

### **1) Background**

Presently, there are many ways to facilitate and develop students' learning which they can understand and learning can affect their achievement. Especially, in the modern technology er. Technology has been taken and adapted for learning and teaching. Students and lecturers are able to have an interaction easily.

The internet is essential for all levels of education. The internet can catch student's attention to learn more. The internet is like another library that students can access for learning.

Moodle Learning Management System is a computer program to be employed for learning and teaching at Christian University. It has been realized that E-Learning can assist students and lecturers for learning and teaching in every course.

Psychology is a fundamental course for 1<sup>st</sup> year students of the nursing faculty, at Christian University. There are many students registered in this course. It is difficult for the lecturer to monitor individual learning and some students do pay attention or skip class. It can cause them to fail the course.

The Psychology course was designed to decrease students' learning problems and help students who did not pass the test. In addition, it was created to harmonize their learning style with technology in modern life. Students can study from online textbooks in Learning Management System and download them. Moreover, they can learn from video clips that is related to the course. Hence, It is interesting to study the efficacy of video

clips learning and satisfaction of Moodle Learning Management System for develop and improving video clips learning and teaching to obtain the highest efficiency and benefits.

### **Keywords**

Moodle e-Learning, video clips, Learning Management System, Psychology e-Learning

### **2. Purpose**

1. To study the efficacy of video clips learning by using Moodle Learning Management System
2. To study students' satisfaction for video clips learning by using Moodle Learning Management System

### **3) Method**

#### **3.1) Population**

Population in this study is 286 students who study in the first year at a faculty of nursing, Christian University, and register in Foundation of Psychology Course, 1/2012 academic year.

#### **3.2) Samples**

The selected 165 samples were calculated from Krejcie and Morgan, 1970. It is a Purposive Sampling and collects data in the Foundation of Psychology class.

##### **3.2.1 Independent variables:**

- Personnel data
- Behavior of employing computer and Internet Network
- Clips video from Moodle Learning Management system

##### **3.2.2 Dependent variables:**

- Attitude and satisfaction for Clips video learning

### **3.2) Materials**

1. Fundamentals of Psychology Program. There are 10 chapters for this course. Theory, activities and clips video were inserted in every chapter

2. Real events clips video, unreal events clips vide and animations clips video were collected from database or website

#### **3. Instruments**

The Instrument of this research was questionnaires which were created from theory, framework and related researches It was divided for 4 parts;

Part1: Personnel data items.

Part2: Employing computer and Internet behavior.

Part 3 : Attitude for clips video learning by using Moodle Learning Management system

Part 4 : satisfaction for Clips video learning by using Moodle Learning Management system

All questionnaires are Likert's Rating Scale

### **4) Data Collection**

The questionnaires were issued for the samples in the last week of the semester. The students were informed about instruction and purpose of this study. Then all data were collected and checked before analysis.

### **5) Data analysis**

It is a quantitative analysis that is calculated in statistical analysis program, measuring frequency, mean and S.D. Satisfaction scales are divided for 5 levels (Prakong Kannasoot 2538:117)) as a following;

4.50-5.00 is Excellent

3.50-4.49 is Very Good

2.50-3.49 is Good

1.50-2.49 is Fair

1.00-1.49 is Poor

Table 1: The attitude of students towards learning from video clips.

| Attitudes of nursing students  | Mean | S.D. | Level     |
|--|------|------|-----------|
| I am enthusiastic to learn from video clips.   | 3.70 | 0.65 | Very good |
| Instruction from the clips video, gives a better knowledge and understanding.                                | 3.84 | 0.68 | Very good |
| Video clips, media sound, images and animations make it easier for me to remember the content of the course. | 4.31 | 0.72 | Very good |
| I can choose a video clip to learn independently.  | 4.24 | 0.66 | Very good |
| I am enjoying the lessons with video clips.  | 3.95 | 0.59 | Very good |
| The video clips helped me to gain useful experience.   | 4.15 | 0.65 | Very good |
| Total  | 4.03 | 0.41 | Very good |

## 6) RESEARCH FINDINGS

The study findings were presented under the following sections:

### 6.1 Personal information data:

Most students were female (98.8%) per a semester grade point average in the past during 2.51-3.00 (47.9%) Students access the Internet from a notebook (83.6%) Students have experience in using computers and the Internet 7-9 years (40.0%) Students use the Internet on university(49.1) Students used the Internet 3-4 hours a day (55.2%) and the students were not learning experience in E-Learning (53.9%)

### 6.2 Attitudes about learning through video clips from the moodle system.

Table 1 stated that the attitude of students towards learning by using video clips as learning that the sound and motion picture to help students easily remember the content of psychology. The students are independent to choose to watch video clips

and not limited the time, place and can be viewed at any time. The class may be time limited. Some of them are absent and students can return to view video clips again after the class. The students have learned and experienced in the use of the content of the courses to be applied in everyday life consistent with the research of sunate (2011) the study effects of Moodle e-Learning as Supplementary on Learning Behaviors of Undergraduate Students shown that students have good attitudes towards the use of media Supplementary technology on the web via Moodle.

### 6.3 Satisfaction of the students to learn through moodle system.

Table 2 stated that students were satisfied with the review of the theoretical psychology because the student can open a video clip from Moodle LMS at program any time. The students have the satisfaction of learning from video clips by using Moodle LMS program at a very good level consistent with the research of

Table 2: Satisfaction of the students to learning from video clips.

| Satisfaction of the students   | Mean | S.D. | Level     |
|--|------|------|-----------|
| I preferred to learn by myself from the video clips.                   | 3.84 | 0.71 | Very good |
| The review psychology content from video clips supported the learning. | 3.99 | 0.62 | Very good |
| Moodle system as a good tool to facilitate learning.                   | 3.86 | 0.65 | Very good |
| I appreciated learning from video clips through Moodle system.         | 4.54 | 0.63 | Excellent |
| Total  | 4.03 | 0.41 | Very good |

F. Achour (2009) the study Moodle-Generated Course at PSU reported that Moodle had a great acceptance of learners and lecturers should encourage supporting other courses.

## 8) CONCLUSION

Learn from these video clips as a supplementary media that encourages students to understand the theory and content of psychology. It has both audio and video clips that capture the attention of students and their learning from experiences directly. Lecturer in the classroom may feel students were bored. Therefore, it is a combination of classroom activities to suit the application and situation in life.

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## Formulate Social Media into Media Information Literacy

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### ABSTRACT

The dawn of media literacy education was seen in mid-1960's. And, developed curriculums introduced media awareness in schools. Continuously, the Grünwald declaration (1982) was the first to state the need for media education to promote competence of critical awareness.

After dissemination of Internet, information and communication technologies were introduced into media education in the Vienna congress (1999). Then, media literacy and information literacy were intertwined as a media and information literacy (MIL) in the Alexandria proclamation (2005). Besides, the proclamation defined that information literacy and lifelong learning are the precondition of the information society. Featured importance of applied skill is explained by a case of a girl saved 100 people when the tsunami hit in Phuket, 2004. Recently, the ability of international cooperation is added in MIL in UNESCO Paris agenda (2007). Thus, the definition of MIL is frequently up-dated. Last year, we have a giant earthquake with the tsunami hit and nuclear power plant accident: Tohoku region pacific coast earthquake. We observed severe damage even in our well prepared area for natural disaster in terms of social infrastructure, disaster prevention, and communication networks. And now, we could collect enormous volume of records with successful and unsuccessful cases concerning MIL.

Then, this study aims to propose points of MIL for contemporary media literacy,

and persuaded what elements need to be introduced. Through investigational study, the author could extract 'curation literacy' in congested social media environments played strong contribution.

### Keywords

Media Information Literacy, Curation, Congested Media Environment, Social Emergency, Tohoku Region Pacific Coast Earthquake

### 1) INTRODUCTION

For the last 25 years, various experiences in media education have been reported both in schools and out of schools. Here, unexpectedly, we had a case to reconsider our MIL in Japan.

Just after the Tohoku region pacific coast earthquake, immediate measure of pre-prepared monitoring mission by the self-defense force notified the tremendous huge Tsunami hit at the coast of Sendai city. Live audio visual is transmitted to Prime minister's office and TV channels in the world (see Figure 1). The first full-motion views with HDTV brought strong effects on people. In fact, more than 400 km length of coastal area was severely destroyed by Tsunami attack.

On the other hand, inland areas were practically unharmed even after strong earthquake by the effects of proof-construction (see Figure 2). Sometimes, situation of inland was broadcasted, but unfortunately, sympathy and compassion scratched out this ordinary information from people's mind.

In addition, the convergence of urgency notification in costal cities by mass

communication brought misunderstandings by rumor and reputation that the most industrial and commercial firms in Tohoku region had fatal damage. Even a company had limited damage, but it was difficult to notify the reality to concerned clients. In fact, clients tended to take immediate actions to switch their orders to another company located in different area.



*Figure 1: Broadcasted Video of Severe Tsunami Disaster in a Special Program of BBC, the Coastal Area of Sendai City*



*Figure 2: Situation of Sendai City, Immediately after Earthquake, March 11, 2011*

*(Cited from East Japan Earthquake Picture Project, <http://archive.shinsai.yahoo.co.jp>)*

Then, the study in this article argues,

- Competency to implement media communication and send a safe message under disaster and limitation.
- Competency to be widely noticed
- Competency to extract valuable information from much information.
- Competency to find trustworthiness of information and way to correct it.

It looks specific area of media competence in front, but verified competence of risk management in MIL would have

possibility to be more important under expanding MIL.

## 2) HISTORICAL OVERVIEW OF MIL

MIL has been developed through international working sessions for more than 30 years. During period, MIL admits to involve an important element of contemporary culture and can be oriented towards encouraging citizen's active participation in society rather than condemn or commend the power of media.

### 2.1) Iowa Educators Pioneer "Media Now" Curriculum, 1968

As dawn of media literacy in a school, Media Now, a first curriculum to introduce high school students to the media world was developed by Ron Curtis in Red Oak, Iowa (Jensen, 2002). This curriculum was designed as module-based and self-directed learning, and had seven modules. It was focused to educate students to prepare rising influence and the emergence of appeared aesthetic and cultural trends.

- Media hardware: how cameras worked and how to operate projection equipment
- Media production: basic shots, storyboarding, scriptwriting and editing.
- Media genre: characteristics of various genres from film and TV to radio and print.
- Media evaluation: keeping a media log and developing criteria for evaluation
- Media interpretation: analyzing visuals, advertising and propaganda
- Media aesthetics: exploring artistic principles in film, TV and radio
- Media presentation: how to present a media message to an audience.

### 2.2) Grünwald Declaration, 1982

The Grünwald Declaration was the first to state the need for education and political systems to promote a critical understanding

of media effects and awareness among citizens by UNESCO (UNESCO, 1982).

The trend was to seek alternatives to mass communication. The following four guidelines for implementation are proposed.

- Development of comprehensive media education programs at all education levels
- Teacher training and awareness raising of the other stakeholders in the social sphere
- Research and its dissemination networks
- International cooperation in actions

### **2.3) Toulouse Conference, 1990**

Due to de-regulation, private TV channels appeared, the end of the monopoly of public TV channels, and regulatory authorities with participation of citizens were started. Strength of electronic media with first systematic links was formed.

Proposed to systematize approaches and to define more accurately what was needed in this field, and set out the urgent need for digital literacy, not as a luxury but as a right of citizens (Thoman, 1990).

### **2.4) Vienna Conference, 1998**

The arrival of digital media has a huge impact on communication system. Set to bridge between media education and the new information and communication technologies, taking into account of the new information and digital age (Chouit & Nfissi, 2011).

### **2.5) Alexandria Proclamation, 2005**

Defined information literacy and life-long learning as a precondition to the information society and basic human right in a digital world by empowering people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and

educational goals (UNESCO, 2005). Here, information literacy

- comprises competence;
- is crucial to the competitive advantage;
- provides the key to effectiveness, and
- extends beyond current technologies.

### **2.6) UNESCO Paris agenda, 2007**

The Paris agenda is twelve recommendations for Media education in order to promote the practical implementation based on four fundamental categories of Grünwald Declaration. In addition, MIL is placed within the framework of lifelong learning at all stages and will cover all media. It is also important to strengthen links between Media education, cultural diversity and respect for human rights. On the other side, importance of creating networks and exchanging in the organization and making international exchange visible are remarked (UNESCO, 2007).

## **3) AREAS OF MIL**

The recognized curriculum and boundary of MIL have been expanded to 11 related literacy (Cheung, Wilson, Grizzle, Tuazon, & Akyempong, 2011). The last three lines shown below were added after Paris agenda, 2007. Now, most lines have a close relationship with Internet technology and information society. Some, media were selectively oriented.

- Media Literacy
- Information Literacy
- Freedom of Expression, Freedom of Information Literacy
- Library Literacy
- News Literacy
- Computer Literacy
- Internet Literacy
- Digital Literacy
- Cinema Literacy
- Games Literacy
- Television Literacy, and advertising Literacy

However, recent expanding cyberspace encompasses personalized creative activities.

Through review work of disaster reports, the author found the fact that difference of literacy competence was extremely amplified. Therefore, this study focused on users' competence of content strategy.

#### 4) CASE STUDY

After the earthquake, 1,940,000 fixed lines and 28,650 cellular base stations had damage. Besides, increased traffic reached 8 times in fixed lines, 5 times in e-mail, and 9 times in international call (Tanaka, 2011). Then, communication restrictions of disaster areas by congestion control were seen in

- 80-90% of fixed line phone
- 70-95% of cellular phone
- 0-30% of IP communication via mobile phone

(Cited from Shikoku Bureau of Telecommunications, 2011)

As a result, communication via Internet and services in cyberspace were extremely powerful under disaster.

##### 4.1) Case Facts

The following noteworthy attentions of beneficial use of media were reported.

###### 4.1.1 Phone

- Cellular network was fastest in restoration (Tanaka, 2011).

###### 4.1.2 P2P communication

- IP service was beneficial to connect than voice call in cellular network.
- Cloud service and data center were safe.

###### 4.1.3 SNS

- SNS (Twitter, Facebook, and Mixi) accesses were increased, and peak was seen in three days after the earthquake.
- Twitter was used mainly for information collection, and 80-90% of messages were produced by beginners.
- Facebook was used mainly for confirmation of safety (Yoshizawa, 2011).

- Skype could be used even after earthquake

*Table 1: Media Availability in an Emergency under Natural Disaster*

| Media                                     | Accessing network   |
|---|---------------------|
| Fixed line call                           | Negative            |
| Cellular call                             | Negative            |
| Emergency message dial and message board  | Yes                 |
| SMS, e-mail                               | Yes, slow and delay |
| Skype, Twitter, Facebook, Mixi            | Yes, active         |
| Amateur radio (440,000 stations in Japan) | Yes, aggressive     |

###### 4.1.4 Amateur Radio

- Amateur radio network and voluntary people established emergent communication for various rescue activities (The Asahi Shimbun Company, 2011).

###### 4.1.5 Temporary Infrastructure

- Temporary satellite over IP service and 3G mobile router were installed in evacuation centers to provide Internet during early restoration (Takahashi, 2011).

###### 4.1.6 Media Mix

- Governmental agencies sent messages to various media simultaneously.

#### 5) FUTURE MIL

Many review researches of the disaster fostered competence to use possible media by periods. Especially, items in preparation period identified necessity of daily experience to access SNS services as well as knowledge of comprehensive media infrastructure.

Period of immediately after the earthquake, some specific knowledge of infrastructure with rapid installation was indispensable to send a safe message to a concerned person. Next, the disaster increased traffic of network, then, valuing vast information quickly, and designing and posting a notable message was important to bring

urgent assistances. This new competence of ‘curation’ is noted in most recent studies (e.g. Rosenbaum, 2011; Sasaki, 2011) Practically, it needs to manage twofold communication under disaster (see Figure 3).

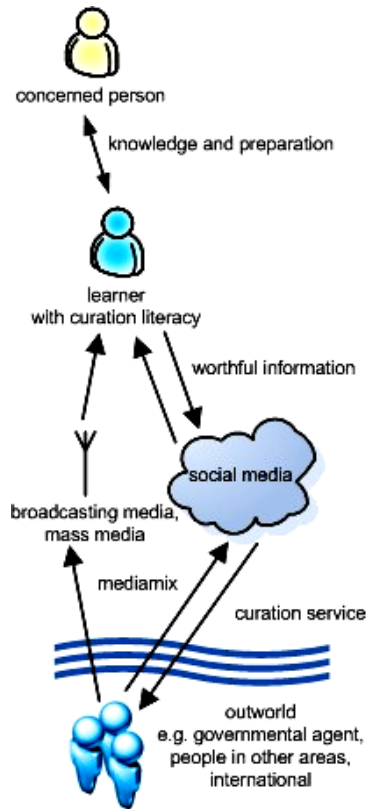


Figure 3: Twofold Urgent Information Communication

## 6) CURATION LITERACY

Sasaki (2011) defined the process of ‘curation’ in terms of competence of users as the following steps.

- Selecting information from massive information based on personally selected criteria
- Implicating information
- Compose a message and share with many people

The emphasis of step would vary depend on the period of disaster (see Table 2). ‘Selection of information’ has great importance in initial period. ‘Implicating information’ to add editorial component and design a message are prominent in early stage also. For implication, this step

requires user’s niche competence in the content area.

In ‘emergent measure period’, target oriented, timely, small sized and qualified messaging strategies are significant to disseminate, such as via Buzztter (Umeki, 2011).

Table 2: Enhancement of Curation Literacy by Period

| Period                              | Accessing network   | Enhancement of Curation Literacy                 |
|-------------------------------------|---|--|
| Preparation                         | A user of cloud service, SNS, Skype, and Twitter                    | -  |
| Immediately after (within few days) | Access SNS and internet service, amateur radio whatever             | especially selecting information                 |
| Emergency Measures (within 3months) | Access daily IP over satellite 3G mobile router to avoid congestion | niche competency, especially composing a message |
| Restoration                         | Access media without congestion                                     | -  |

On the other side, curation service for an organization is becoming indispensable to have successful communication with related people during facing content overload environment (Tanaka, H., 2012). Forry (2009) of content-ment.com highlighted importance of ‘curation’ and explained as applied content strategies.

- Curation involves, in some part, a manual task
- Curation starts with sources to parse
- Content is evaluated individually based on established editorial criteria
- Content is weighted based on context, current events, branding, sentiment, etc.
- Approved content is published on appropriate schedule

Here, automated aggregation of Web2.0 era was advanced methodologically in a manual task. Meanwhile, the process looks more enhancements on quality of service.

## 7) ACKNOWLEDGMENTS

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## **Innovation of Knowledge-based Hyper-multimedia to Promote a Culture of Using ICT Creatively for Adolescents**

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### **ABSTRACT**

The purpose of the present research was to develop an innovative knowledge-based hyper-multimedia to promote a culture of using information and communication Technology (ICT) creatively for adolescents. Their learning processes and attitudes toward such innovation in their community were also examined. Thirty juveniles, 13-18 years of age in each Hangdong and Maerim districts, Chiang Mai province were employed in the study. Data collections were made through questionnaires and interview, testing, group discussion and brainstorming. Analyses and evaluation were carried out with the applications of sufficient economy philosophy, constructivism theory and Torrance's future problem-solving instructional model.

Results showed that the learning innovation of hyper-multimedia presented by the use of animation, video, scene and sound with related action script synchronization was considerably effective. With the application of sufficient economy philosophy, the result indicated that performance efficiency (E1/E2) was 92.22/89.83 and the adolescents learning processes and attitudes were very good. These included purchasing of moderate ICT equipments, information screening for self-immunity and creative using of internet and ICT morally and ethically according to the computer laws. This independent learning system was properly designed for the juveniles with the right to retrieve the data or stop using at anytime. By using Torrance's approach and constructivism theory emphasizing on brainstorming techniques, it was noted that

learning process was very well adopted by the adolescents with high satisfaction. They had good attitudes toward the extension of sufficient ICT cultural using in their community with emphasis on brotherly relationship. Related organizations should educate their parents to instruct the juveniles to use the internet properly and encourage everybody to be aware of ICT business in order to protect social and cultural problems encountered in the future.

### **Keywords**

Adolescents, Animation and video, Constructivism theory, Hyper-multimedia, ICT creative using, Learning innovation, Sufficient economy philosophy, Torrance's model

### **1) INTRODUCTION**

A continuing advancement in globalization ICT (Information and Communication Technology) has much influence on economic, social, culture and human resource. Presently, the use of ICT through internet social network and mobile phone applications has been increasing tremendously worldwide. Asian populations including Thailand, Malaysia, Vietnam and China use the social webs and mobile phone online with an average of 5.2 and 3.1 hours per week per person, respectively (TNS, 2010). Recently, approximately 20 million Thai people are engaged in the online network, 40% of them utilize it for games and entertainment (Tuntawichian, 2010).

Very often, misapplications of ICT were noted and widespread, particularly, among Thai adolescents. They use up much of the

time in the social network with destructive online behavior and create many problems in the society. In order to protect social problems as well as to improve human quality in the future, it is critical important to urge the adolescents to use the ICT creatively.

Hyper-multimedia including animation and video have been utilized successfully for e-Learning and education (Department of Education, 2001; Khammanee, 2002; Songkram, 2010). Thus, to improve and stimulate adolescent learning as well as to fulfill their need in ICT daily lives, the media could be productively incorporated into the learning process. In effect, an appropriate design of hyper-multimedia would influence adolescents to use the ICT properly. The purpose of the present study was to develop an innovation of knowledge-based hyper-multimedia for adolescents to use the ICT creatively. Learning process management and adolescent attitudes toward the innovation in their community were also investigated.

## 2) RESEARCH METHODOLOGY

A learning innovation of knowledge-based hyper-media entitled : Royal Theory for Cultural Use in ICT was developed in Chiang Mai during 2009-2010. The system consisted of hardware processor : Intel® Core i7-2630QM, RAM : DDR3 2GB. For the user : CPU, Pentium 4 2.4 Gh. or higher, RAM : 1 Gb. or more. With an application of sufficient economy philosophy, a trial software involving cartoons, video editing, sound and scene with related action script synchronization was designed for learning. The contents including questionnaires were examined, criticized and recommended by a group meeting of six academic professionals. The system performance was then corrected and improved succeedingly by three technical experts.

Thirty volunteer juveniles, 13-18 years of age in each growing district near Chiang Mai city, Hangdong and Maerim districts were used in the study. The former group was used for the evaluation of innovative learning effectiveness, while the latter was employed for learning process management and adolescent attitudes toward the innovation in their community.

Prior to the actual trial for the innovation effectiveness evaluation, a pilot trial was carried out with three, 13 (male), 15 (female) and 18 (male) years of ages. For the actual trail, the 30 juveniles used for the evaluation were evenly distributed regarding to sex and ages.

Exercises containing in the learning contents consisted of 15 questions relating to the adolescent opinions of sufficient economy using of ICT. After the learning, the juveniles were also inquired to answer 20 more questions for testing regarding to the knowledge of the learning contents. In addition, questionnaires concerning their attitudes toward the use of e-Learning innovation were also included. Performance efficiency ( $E_1/E_2$ ) of the innovation was evaluated from the exercises scores in the learning contents ( $E_1$ ) and in the testing ( $E_2$ ) according to the method used by the Department of Education (2001).

Results obtained from the innovative learning were applied to manage the learning processes for adolescents. Their attitudes toward the innovation in the community were also examined. Analyses and evaluations were carried out with the applications of Torrance's future problem solving instructional model and constructivism theory emphasizing on brain storming techniques (Khoutrakool, 2002; Khammanee, 2008).



### 3) RESULTS AND DISCUSSION

#### 3.1) Performance and effectiveness of the hyper-multimedia learning innovation for cultural use of ICT creatively

Results showed that the learning innovation development of knowledge-based hyper-multimedia concerning the sufficient economic cultural use of ICT was successfully accomplished. The learning process presented by the use of animation, video, scene and sound with related action script synchronization was considerably effective. The process lasted approximately 70 minutes. With the application of social constructivism design theory (Khammanee, 2008), the innovation was presented into 8 sections : 1) Title, 2) Main Menu, 3) Submenu, 4) Contents, 5) Questions, 6) Download Contents, 7) Cartoon IT and 8) End, in which the main menus are presented in Figure 1.



Figure 1: Preview of the main menus.

Table 1 : Performance efficiency ( $E_1/E_2$ ) and effectiveness of innovation evaluated from 30 adolescents.

|                         | $E_1/E_2$   | Average value <sup>1</sup> | Effectiveness |
|-------------------------|-------------|----------------------------|---------------|
| Efficiency (%)          | 92.22/89.83 |                            | Effective     |
| Innovation design       |             | 4.56                       | Very good     |
| Content appropriateness |             | 4.73                       | Very good     |
| Learning benefits       |             | 4.82                       | Very good     |
| Learning satisfaction   |             | 4.67                       | Very good     |

1 : Based on 1-5 rating scale (Likert, 1967)

The innovation performance and effectiveness evaluated from the 30 adolescents were summarized in Table 1. It should be noted that the performance efficiency of the present innovation was considerably effective with the percentage of  $E_1/E_2$  of 92.22/89.83. According to the Department of Education (2001), the reported effective value was in the range of 80/80-90/90. In addition, all evaluated aspects including innovation design, contents, adolescent benefit and satisfaction were in very good level (Table 1). The knowledge gained from the learning process included moderate ICT equipment purchasing, information screening for self-immunity and creative using of internet and ICT morally and ethically according to the computer laws. Furthermore, the learning system could be operated independently with the right to retrieve the data or stop using at anytime.

#### 3.2) Learning process management and adolescent attitudes toward creative using of ICT in their community

Besides the accomplishment of the learning innovation for adolescents, it is important to manage and promote the ICT using creatively in their own community. With the applications of Torrance's future problem solving instructional model and

constructivism theory emphasizing on brain storming techniques, the learning process could be managed successfully. Adolescents had good attitudes toward the extension of sufficient ICT in their community with emphasis on brotherly relationship. Related local organizations should educate their parents to teach the juveniles to use the ICT properly. It is everybody responsibility to be aware of ICT business in order to protect social and cultural problems encountered in the future. Results obtained from the present study were similar to those reported by Adiwutanasit (2002) and Preetiprasong (2008).

#### 4) CONCLUSIONS

With the applications of sufficient economic philosophy, Torrance's approach and constructivism theory, a learning innovation of knowledge-based hyper-multimedia for adolescents was developed successfully in the present research. The adolescents had good attitudes toward the cultural using of sufficient ICT in their own community with emphasis on brotherly relationship. Everybody should be aware of ICT business in order to protect social and cultural problems encountered in the future.

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## Transitioning an E-teacher Portfolio in Empowering the Role of Lifelong Learning

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### ABSTRACT

As a response to the ongoing development of educational reforming in Thailand underlying National Education Act B.E. 2542 (1999) and Amendments (Second National Education Act B.E. 2545 (2002) which call for the implementation of more innovative technology-assisted method of teaching and it relates to the ultimate goal of universal education which puts its focus on a path of lifelong learning, this pilot project report aims to summarize of activities and findings of using an e-teacher portfolio, which is a non-traditional tool and it is used as a part of reflecting teaching English for Edutainment course (01-014-013) at Rajamangala University of Technology Srivijaya, Songkhla Thailand, in empowering the role of lifelong learning. It explores how the teacher makes use of an e-teacher portfolio to support her professional teaching development more effectively. In addition, the combination of an e-teacher portfolio and a lesson plan decoding was considered as a practical tool in this study. Results of the study reveal that e-teacher portfolio strongly induces the teacher to become a lifelong learner/educator because it is portable and accessible in everywhere to reflect what she had done in her classes by decoding her lesson plans. By doing this, it helps the teacher raise her awareness in preparing more authentic lessons as the unlimited on-lined multimedia sources are highly motivated her in looking back what happened in her classes and make her classrooms to be more alive. Apart from that, a blog provided in e-teacher portfolio is a value contact channel for her students

keeping on connection both inside and outside classrooms. Many students always share their outside classroom activities, especially the students who are from the unrested problem areas and they try to communicate with their authentic languages (Malayo and on-lined utterances). Meanwhile the teacher found that it can lead her in designing an authentic assessment.

### Keywords

electronic teacher portfolio (e-teacher portfolio), a lesson plan decoding, lifelong learning

### 1) INTRODUCTION

**In the 21<sup>st</sup> century**, which is generally accepted to be the age of globalization, the information society and knowledge-based economy have had a big impact on educational reform so that the key theme of education is lifelong learning. Thus, the idea of learning-to-learn skills was widely adopted in educational policy all over the world. Consequently, the modes of teaching and learning changed from traditional ways e.g. materialism or consumerism, to anti-authoritarian ideas. This turned into the learner-centered approach in which lends originally itself in promoting autonomous learning skill and approaches learners involving in lifelong learning mode. Most language teachers and researchers bear in mind both the ideas and practice of autonomous learning. Three main rationales underpin promoting autonomy in ELT. *Firstly*, learning is a lifelong process. It is clear that the teacher

cannot teach learners everything that they would like to learn; the teacher, therefore, can best serve them by equipping them with ways to teach themselves to learn. At the same time, the speed of technological development in today's world had made it necessary for changes to guide the learners' learning outside the classroom. Consequently, fostering learner autonomy in our classes can best prepare learners to pass through to the real world where they can explore their strategic competence to learn what they need to know through their own experience. *Secondly*, promoting learner autonomy is a priority because a huge number of English sources which can be used as learning inputs are provided throughout the world. The learners can access many channels of information to equip themselves with tools and strategies which will empower them to benefit from the opportunities in extending classrooms. The last reason is to do with the nature of learning. The most effective learning has an underlying personal learning process. This takes place when learners feel their wants and exercise their will to learn. Teachers can encourage them to be actively involved through positive learning activities and a positive environment. It is not meant that teachers take all the responsibility in the learning and teaching process. The students are enabled to take responsibility by making decisions on their needs, goals and assessment. This leads them to shape their fundamental learner independence.

**As a teacher in 21<sup>st</sup> century**, we cannot deny that an online education;- computer based aids in teaching and learning process which involves computer enhanced learning information and studying materials that primary gains from computers and internet connection, now plays more a significant role in our career. This is widely used to all educational levels and both of teachers and learners now can possibly earn their entire studies through online with the aids of computers.

For instance, it comforts and supports teacher and learner in managing their time. They can work on their study any available time e.g. revising, reviewing, and preparing in advance. Furthermore, through this online education, it helps the individual improve their career development in which they can get more professional opportunities e.g. a better wages, higher rank promotion and more effective working skill. Therefore, electronic literacy (mastery of basic technology skills) has become a prerequisite for both teachers and learners in this era. Without necessary electronic competence, we will find ourselves at a disadvantage educationally and opportunistically.

### **Portfolio and Electronic Portfolio**

Basically an electronic teacher portfolio means a portable and accessible. However, many e-teacher portfolio experts define that a digital storage processes have largely replaced the more traditional paper type as the need to present not just information, but sound, motion, and color has become the standard. Some claims that the definition of portfolio is depending on the purpose of using. At their simplest, **portfolios** are collections of documents, whereas; **e-portfolios** are collections of documents, often in multiple media, relating to the achievements of individuals. In education, they usually take the form of individually tailored online spaces, where they can assemble collections of their individual and collaborative work. It's becoming more and more common for e-portfolios to draw in material from other [web](#) services like [social sharing](#) sites (Lopez and Fernandez, 2006). An e-portfolio is a purposeful collection of work and information that:

\*represents an individual's efforts, progress and achievements over time

\*is goal-driven, performance-based and indicates evidence of the attainment of knowledge, skills and attitudes including self-reflection  
\*is a tool for facilitating life-long learning and career development

## 2) BACKGROUND

### 2.1 Edutainment course

English for Edutainment course (01-014-013) is a non-compulsory course provided for RMUTSV undergraduates in every semester, the topic designed in this course consisted of songs, movies, games, plays and poems. These lend themselves to make use any kinds of electronic innovative technology assisted method of teaching and learning like VDOs, CDs, DVDs and so on and of course the social network learning modes play more a significant roles in today world learning. They were adopted in this course lesson planning. Each lesson is always designed as a power point presentation including suggested web page to further study.

### 2.2 E-teacher Portfolio

The e-teacher portfolio was generated wholly by teacher herself. It was free form and structure but when the students visited this page, they had to answer the first survey question "What do you expect to see in my e-teacher portfolio?" and when they would leave this page there was a question "Which part do you like most in my e-teacher portfolio? The data from these two questions were evaluated and then adapted or applied more towards the requested information. That's why the researcher provided the free form of her e-teacher portfolio. It could be said that it was usually regularly modified and updated during the period of teaching course on English for Edutainment (01-014-013). It often incorporate some interactivity between teachers and students, or between students and their peers.

Therefore, there are four main reasons in my e-teacher portfolio:-

To record what I did and will do in my classes each semester.

To reflect and decode what / why I have done that in my classes.

To store all documents in digital format and

of course, to improve my professional career.

Furthermore, this electronic teacher portfolio is to make use of modern technologies to create and publish a digital document into various types (e.g. audio, video, graphics, and text) that my students and interested persons can access and read through the computer. Also, through these electronic technologies, my students can contact me all the time. The data obtained from this page would be reflected and analyzed in views of teacher development planning and lifelong learning modes.

### 2.3 Lesson Plan Decoding

The lesson plan of English for Edutainment course (01-014-013) was designed daily, weekly and monthly to be an outlined in teaching each time. This included seven elements:-*name of the lesson, objectives (specific skills/information that will be learned), information (given or demonstrated necessary information), verification (steps of check understanding), activity (describe the independent activities to reinforce the lesson), summary (both view of teacher and student guide) and material needed:- other resources (web sites, journals or books) and additional note.* The obtained data from lesson plan would be decoded and analyzed in terms of teacher development planning and lifelong learning areas.

### 3) METHODOLOGY

#### 3.1 Participant

In this study, I would describe myself as an e-teacher portfolio learner, teacher and researcher. I am especially interested in e-teacher portfolios for reflection and personal development planning in teaching on the English for Edutainment course (01-014-013) and summarize of activities and findings of using an e-teacher portfolio effectively to support and evidence these areas. I was introduced to e-teacher portfolio on teaching the Computer Engineering students at Rajamanagala University of Technology in 2011/2. Then, e-teacher portfolio was used to support a reflective practitioner module I took.

#### 3.2 E-teacher Portfolio and A Lesson Plan Decoding Analysis

Even the e-teacher portfolio did not put the focus on the form or structure, the overview of e-teacher portfolio and lesson plan English for Edutainment course (01-014-013) were the main of being reflected and daily and weekly, monthly and final reflection. This would be described in procedure.

#### 3.3 Procedures

As the lesson plan of English for Edutainment course (01-014-013) was designed throughout the course. Firstly, each lesson plan posted in e-teacher portfolio in weekly was read, and reflected daily before and after class. Secondly, it was read and reflected again weekly and monthly. Lastly, the final reflection was summarized after course ending.

#### 3.4 Data Analysis

To analyze the data, the researcher first, recalled from her memory a process of conducting the e-teacher portfolio of English for Edutainment course (01-014-013). Therefore, the e-teacher portfolio and lesson plan decoding analysis was interpreted and reported as the reflection described in what ways that the e-teacher portfolio and lesson plan decoding empowers the lifelong learning.

### 4) FINDINGS AND DISCUSSION

With step-by-step processes, non-technical language, and helpful tips in preparing teaching through e-teacher portfolio of English for Edutainment course (01-014-013) in this study, Three phases were discussed;- increasing self-understanding of professional competence, empowering the role of lifelong learning, and raising awareness of language learning.

#### 4.1 Increasing self-understanding of professional competence

During writing my reflection throughout a semester, I felt that a strong need to learn more because it was increased my self-understanding of professional competence in terms of the subject-matter and pedagogical expertise. Firstly, the subject matter expertise:- by doing e-teacher portfolio and reflecting it daily, weekly and finally, I found that the knowledge of subject matter taught was ready delivered any time and place.

*Daily reflection (9 December 2011)*

*"I didn't hesitate to start the class earlier at 8.30 on Friday because a half of my students have to pray at the mosque (all muslim students) Friday afternoon ....they negotiated with me before class only 10 minutes and today I got...impromptu class fluently and I got positive feedback from my ....."*

This is because the e-teacher portfolio motivated teacher to follow up her class before and after class regularly then she became the subject matter expertise. Undoubtedly, she felt fluently and confidently delivery her classes.

Secondly, pedagogical expertise:- I learnt and raised awareness of individual differences. This happened during doing e-teacher portfolio (lesson planning). The nature of each group came to my mind when designing the learning activities posted on my page. Moreover, I imagined the responses of each student.

*Weekly reflection (17 December 2011)*

*“I should follow Mr...X... response and tell him to visit more on these websites :- <http://www.youtube.com/watch?v=gkBvu hBBhvA> and <http://www.youtube.com/watch?v=oHgV myEDcmk> like I did for Mr. ...Y... ohh....I should do it now”*

It was obvious seen that I intend to follow up each class and individual from their interests and needs. This is because my e-teacher portfolio accessibly at all time. It comforts me to hold my students' hand when he needs help.

It could be said that becoming expertise in subject-matter and pedagogy was a priority for professional development and this lends itself to play an important role in lifelong learning.

#### **4.2 Empowering the role of lifelong learning**

The curiosity of learning and following up the student individually brings about empowering the lifelong learning. Apart from the contents, teaching and learning aids and resources were accessible and portable which serves and motivate both teacher and students learn more when they have available time. The space provided called “blog” in e-teacher portfolio was a practical contact channel among teacher and students, students and their friends. Through this blog, the students and teacher always used it in chatting, negotiating and sharing their daily life both inside and outside the classroom. This authentic talk helps creating a positive atmosphere.

*Daily reflection through blog (9 December 2011)*

*Student X : “Ajarn (teacher), Are you free on Friday morning?”*

*Teacher : “Nothing much ....Anything I can help you guy?”*

*Student X : “ Shall we start our class in the morning at 8.30 am. I and my friends (15 muslim students) have to go praying at Bann Bon Mosque”*

*Teacher : “Emm ...ok but last Friday I could wait your group for 20 minutes late”*

*Student X: “That’s ok... but the topic this Friday on “Songs” sounded interested me”*

*Teacher : “Really????? ...ok then...pls tell your friends ”*

*Student X : “Thanksssssss Cool!!!!”*

This showed the flexibility and ready to delivery class depending on the students' need with reasonable support. Furthermore, the students could acquire the knowledge of subject-matter more when they felt to learn and this also would direct them to further study outside classroom. The lifelong learning mode is then gradually shaped up.

#### **4.3 Raising awareness of language learning**

It also helps both teacher and students to monitor their learning language towards increasingly self-directed, negotiated language learning and self-assessment. This involves knowledge about learning strategies. At a higher level of abstraction, the meta-cognitive knowledge of learning helps students to improve their ways of planning and monitoring their learning processes (Kohonen 200b; 2001a).

*Final reflection (29 January 2012)*

*“It is not only me as a teacher and provider the value source through this blog but I learnt that my students are the best resources guider.....”*

*From blog (18 January 2012)*

*Student Y :*

*“Ajarn (Teacher), I would like to suggest this website*

*<http://www.vcharkarn.com/vblog/51081/I> it might work...ajarn...”*

*Student Y :*

*“But I love these <http://www.agendaweb.org/> and*

*<http://www.agendaweb.org/songs/best-songs-A-C.html> it’s inter....you can choose you favorite singer here..hahaha”*

**Student Z:**

“ ....for me this help me a lot to understand the meaning of English song <http://lyricstranslate.com/en/artist>”

This was about sharing a valuable source in learning language. It could be implied that the students spent their free time outside classroom to further study and they felt to share the other especially teacher. Language learning is meta-process since they tried to search more about the topic learnt and their need in learning.

## 7) IMPLICATION AND SUGGESTION

General implication and suggestions through daily, weekly and finally reflection, about using e-teacher portfolios effectively for teacher development and lifelong learner, including;- form and features, context , ensuring quality and enhancing awareness and access.

### Forms and Features

Through sharing information about the practices of recognition of non-formal and informal learning, the teacher as the e-portfolio designer has identified some common themes and issues that establish or enhance the learners for the recognition of what the focus topics prompted in teaching period weekly or monthly. Then the teacher has to remain that features as a certain period of time e.g. purpose of each unit, it is important that the purposes are clearly identified. Therefore it is recommended that form and structures whilst developing or reviewing such preparing teaching channel.

### Context

This context may affect what is possible and will dictate the areas that resources must be directed to. For this reason, this report does not suggest one model.

### Ensuring quality

It is essential that quality assurance is built into any system for the recognition of non-formal and informal learning. This can be achieved in many ways, including the setting of national standards and guidelines,

self assessment by providers of recognition services and monitoring for consistency and transparency. The goals of quality assurance may vary from maintaining a minimum benchmark to the promotion of continual improvement.

### Enhancing awareness and access

Individuals are aware of them, consider them to be of value and are able to access them without unnecessary restriction. This means that consideration needs to be given to appropriate mechanisms for raising awareness of recognition systems and their potential value to individuals and to society.

## 8) CONCLUSION

An e-teacher portfolio has strongly potential and beneficial to encourage and support lifelong language learning, but it needs how the designer/teacher maximize its potential to drag an individual development through continuum of learning from a young generation through to ongoing lifelong learning mode. However, the powerful form and structures of an e-teacher portfolio technology e.g. the social networking and the ability to create different views and control access to through views affect control and motivation would be a potential at the beginning stage.

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## Edmodo: A User-Friendly Social Learning Platform

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### ABSTRACT

**This study aims to investigate how a non-digital native teacher can make use of Edmodo to set up an online classroom community for her students to work online concurrently with their physical classes. The study also shows the teacher's and students' perceptions towards using Edmodo. The subjects of this study were a 57-year-old teacher of English and 81 freshmen at King Mongkut's University of Technology Thonburi, Thailand. The three research instruments used were a diary, a questionnaire, and Edmodo. A diary was kept to find out how the teacher used Edmodo and her perceptions towards using it, while a questionnaire was employed to investigate students' opinions and suggestions towards using Edmodo. The data automatically recorded by Edmodo were also collected to examine the use of Edmodo. The crucial result of this study reveals that Edmodo is a wonderful and user-friendly social learning platform that enables even a non-digital native teacher to take charge of her own exploring and making use of the site to set up her online classes. Students also strongly agreed that they liked and enjoyed working on an online class via Edmodo.**

### Keywords

Edmodo, digital native learners, non-digital native teachers

### 1) INTRODUCTION

Today's students are becoming the first new generation or *Digital Natives* whose entire lives are linked to computers and other digital activities on the Internet.

Accordingly, they are seen as "native speakers" of the digital language of computers, video games, and the Internet (Prensky, 2001). In addition, the research conducted by the British Council in 2007 revealed that 69% of learners around the world said that they learned most effectively when socializing informally. The result of this research also showed that students with strong social networks performed well academically. Therefore, if teachers want to remain relevant to their students and be effective teachers, they need to use 'learning technologies' to help students reach the world outside the classroom. Accordingly, teachers should become network administrators to find out what social networking sites students like to use and introduce free learning opportunities through helpful sites for them (Dalton, 2009). Unfortunately, a large number of teachers were not born at the same period as their students and grew up before these technologies emerged; therefore, they may make use of computers and the Internet in different ways. While young learners like socializing with friends and other people via Facebook, Twitter, or Blog, as well as accessing, searching for, or downloading information really fast, many teachers sometimes struggle to learn these skills. They may also hate socializing with other people online because of many reasons ranging from eyesight problems to the time-consuming nature of this activity. Besides, some teachers might not be ready to use those technologies. Lipsett (2008) reveals an important finding of the research conducted by the National Foundation for Educational Research (NFER), the UK's largest independent provider of research for education, that a third of 1,000 teachers struggled to use the technology which schools were equipped

with because they lacked necessary skills to make the best use of the technology available to them. Therefore, it is a challenging idea to think of a suitable way to encourage non-digital native teachers to be able to start communicating online with these students happily and successfully.

## 2) LITERATURE REVIEW

### 2.1) Social Networks and Education

The rise of the Internet and online communication technologies has changed the way people work, communicate, socialize and learn as a 'network society' (Castells, 1996:21). Online communities provide an increased choice for people to choose to contact with anyone, especially those with common interests, values, beliefs or passions (Baym, 2002). On-line social networks are also an excellent communication tool for knowledge construction based on social relations, conversation, collaboration, and shared work. Therefore, the networks can be used as an extension of a physical classroom to help students stay in touch with their teachers, while the teachers can also consult other teachers and educational institutions to update their knowledge and learning methodologies as well as developing collaborative working (Arroyo, 2011). Miller (2011) explains one of the benefits of virtual communities that these communities can compensate for the lack of community in the real world. So, students who are shy and do not participate in class can communicate with their teachers and classmates in the Internet-based communities.

### 2.2) What is Edmodo?

Edmodo is a free and secure learning platform designed by Jeff O'Hara and Nick Borg in 2008 for teachers, students, parents, schools, and districts, and is available at [www.edmodo.com](http://www.edmodo.com). This

website looks similar to Facebook, but is much more private and safe because it allows only teachers to create and manage accounts and only their students, who receive a group code and register in the group, can access and join the group; no one else can participate or spy on the group. The site provides a simple way for teachers and students in a virtual class to connect and collaborate. For example, teachers can send out quizzes and assignments, give feedback, receive completed assignments, assign grades, store and share content in the form of both files and links, maintain a class calendar, and conduct polls, as well as send notes, and text (SMS) alerts to individual students or the entire class. Students can also share content, submit homework, assignments, and quizzes, receive their teacher's feedback, notes, and alerts, as well as voting on polls (Jarc, 2010). Hence, Witherspoon (2011) concludes that Edmodo can be seen as a Learning Management System (LMS) which can facilitate teachers to set up and manage their online classes easily. Moreover, Edmodo was recognized by the American Association of School Librarians in 2011 as one of the top 25 websites that fosters the qualities of innovation, creativity, active participation, and collaboration (Habley, 2011) in the category entitled '*Social Networking and Communication*'.

## 3) PURPOSES OF THE STUDY

This study aims to investigate how a non-digital native teacher can make use of Edmodo to set up an online classroom community for her students to work online concurrently with their physical classes of LNG 102: English Skills and Strategies in one semester, during December 1, 2011-May 8, 2012. It also aims at examining the teacher's and students' perceptions towards using Edmodo.



## **4) RESEARCH METHODOLOGY**

### **4.1) Subjects**

The 57-year-old teacher subject was a non-digital native teacher of English at King Mongkut's University of Technology Thonburi. The 81 student subjects were the three groups of freshmen who were, at that time, studying LNG 102: English Skills and Strategies with the teacher. The first group included 27 adult learners (officials of The State Railway of Thailand) of the Department of Civil Technology Education. Their average age was 30 years; however, there were 5 students whose ages were 43-51 years. The other two groups were 27 students of the Department of Production Engineering and 27 students of the School of Information Technology. Their average age was 19 years. Over half of the students (69%) indicated that their computer skills were neutral, and almost all the students (97.53%) used Facebook to communicate with their friends in L1. Neither the teacher nor the students had ever used Edmodo before this study.

### **4.2) Research Procedures and Instruments**

The teacher set up 3 online classes via Edmodo for her student subjects. Then, the students were asked to register and join each online class to submit their work to the teacher, get feedback, correct their work, and post their completed work to the class.

Three research instruments were employed in the study: a diary, a questionnaire, and Edmodo. The teacher had kept a diary from July 2011-May 2012 to investigate how she learned and used Edmodo, including her perceptions towards using it. The questionnaire, with a five-point Likert-type scale asking for opinions towards using Edmodo and two open-ended questions asking about problems and suggestions, was given to all the students

at the end of the course. The data recorded automatically by Edmodo were also collected to examine the use of Edmodo.

### **4.3) Data Analysis**

The data from the teacher's diary was analyzed and grouped into three groups: dates, activities on Edmodo, and reasons/opinions. Then, the researcher further categorized the information by dividing it again into two groups: how the teacher learned to use Edmodo, and her perceptions towards using it. The data from the five-point Likert-type scale were analyzed by using a rating guide as follows: 4.21-5= strongly agree, 3.41-4.2= agree, 2.61-3.4 = neutral, 1.81-2.6= disagree, 1-1.8= strongly disagree, while the data from the open-ended questions were grouped to see salient points of problems and suggestions. Finally, the data collected from Edmodo were analyzed and grouped in terms of activities the teacher did during the semester.

## **5) RESULTS AND DISCUSSION**

### **5.1) Making Use of Edmodo**

#### *5.1.1 Functions Used*

The data from Edmodo ([www.edmodo.com/chada](http://www.edmodo.com/chada)) reveal that the teacher used only some functions related to the physical classes she taught. As shown in Table 1 below, we can see that the function that she used most (127 times) is 'Note' which was used for receiving students' work, checking and giving feedback, and sending it back as an attached file to her students. However, the teacher also sent 'Alert', 'Reply', 'Quiz' as well as 'Poll' to her students.

Table 1: Activities via Edmodo

| Activities via Edmodo   | Times |
|---|-------|
| 1. Sending 'Note' + attached file<br>- giving feedback                  | 127   |
| 2. Sending 'Reply'<br>- students' messages<br>- asking about work, etc. | 15    |
| 3. Sending 'Alert'<br>- reminding about quiz, exam,<br>and work         | 10    |
| 4. Designing and posting 'Quiz'   | 3     |
| 5. Setting 'Poll'   | 1     |

### 5.1.2 Learning How to Use Edmodo

The data analyzed from the teacher's diary, shown in Table 2 below, indicates 3 periods of studying Edmodo. We can see that the teacher did not study how to use the entire functions of Edmodo before using it (July-November 2011), but only necessary functions like 'Register', 'Set group', and 'Note'. While working with the students on online classes (December 2011- May 2012), interesting functions like 'Alert', 'Poll', and 'Quiz' inspired her to study and make use of them. In addition, problems that the teacher and the students faced during using Edmodo encouraged her to learn how to use other functions of Edmodo to solve the problems. After the course was over, the teacher kept on learning a new function, a discussion mode, by asking her students to share their ideas about animals in a passage of the third quiz.

Table 2: Studying about Edmodo

| Time                         | Functions  | Items |
|------------------------------|--|-------|
| Before using<br>Jul.-Nov.11  | 1. Need: Register,<br>Set groups, and Note   | 3     |
| While using<br>Dec.11-May12  | 2. Interest: Alert, Poll,<br>and Quiz  | 3     |
|                              | 3. Problem-solving<br>- Delete post<br>- Edit post<br>- Sending a quiz<br>to individual<br>student, etc. | 15    |
| After using<br>May 9, 12-... | 4. New function<br>- discussion  | 1     |

The pattern of studying how to use Edmodo above shows the limitation of digital skills the non-digital native teacher has, so it takes a lot of her time to explore

and learn it herself. Therefore, the teacher chose to focus on only necessary and really interesting functions and functions that helped her solve the problems occurring while using the website. However, continuing to learn a new function shows that the teacher intends to study and use other useful functions of Edmodo.

The extracts from her diary below also show that, apart from lacking digital skills, being afraid of taking a risk is another reason preventing her from studying and using all the functions of Edmodo:

*"During the registration, some students sent messages to say hello to me and the group. This inspires me to think of chatting via a 'blog' in Edmodo, but I don't study how it can be used because I have planned to use Edmodo as a platform for checking students' work. I don't want students to do something else; otherwise, they may not finish their required tasks which are 35% of the total marks of the course."* (January 9, 2012)

*"Today one team did not get my feedback via Edmodo because the leader of their team, who submitted the work and got my feedback, did not come to class. So, I start sending feedback to all members of each team. I think of using a 'create small group' function, but I can't do it now because I don't know what will happen to the organization of the whole class. I can't do anything that I am not sure about it."* (April 10, 2012)

## 5.2) Teacher's Perceptions

### 5.2.1 Positive Attitudes towards Edmodo

The extracts from the teacher's diary below reveal that the teacher likes Edmodo very much owing to its simple and user-friendly functions, the private nature of its community, and its teaching and learning support.

*"I am very happy that I can design my first quiz, set a due date and time for the quiz and assign students to do it. All steps are very easy like a DIY process. Adding a link to a quiz is excellent because I don't have to write a passage for the reading quiz myself."* (February 16, 2012)

*"I have just found out that each student can submit his/her work directly to me by clicking my name*

and then click 'send', so other students cannot see it." (February 21, 2012)

### 5.2.2 Overestimation of Using Edmodo

We can see that the teacher overestimated her students' digital skills as shown in the extracts from her diary below:

*"One adult student sent a message asking how to submit a completed work to his class. I didn't demonstrate how to post a message and attach a file because I thought students should have done these things without any problems, but my expectation was wrong."* (February 27, 2012)

*"One IT student told me that she didn't finish her quiz because she was cooking while doing the quiz without noticing the quiz time. This problem is not my expectation."* (March 4, 2012)

The researcher thinks that over-expectations may lead to negative attitudes toward using Edmodo. So, the teacher should avoid overestimation of students' digital skills and spend some time in her physical classes demonstrating important functions that are necessary for students. It might be better than solving the problems later.

## 5.3) Students' Perceptions

### 5.3.1 Convenience of Using Edmodo

Table 3: Convenience of using Edmodo

| Items                          | $\bar{X}$ | SD   | Level          |
|--------------------------------|-----------|------|----------------|
| 1. log in and log out quickly  | 4.36      | 0.65 | Strongly agree |
| 2. register easily             | 4.28      | 0.72 |                |
| 3. easy steps of doing a quiz  | 4.28      | 0.76 |                |
| 4. load any page quickly       | 4.31      | 0.68 |                |
| 5. never fail                  | 4.42      | 0.66 |                |
| 6. attach a file easily        | 4.36      | 0.65 |                |
| 7. submit/post easily          | 4.38      | 0.71 |                |
| 8. post messages/files quickly | 4.30      | 0.67 |                |
| 9. vote easily                 | 4.14      | 0.77 | agree          |
| 10. download quickly           | 4.16      | 0.64 |                |

Note: 4.21-5= strongly agree, 3.41-4.2= agree, 2.61-3.4 = neutral, 1.81-2.6= disagree, 1-1.8= strongly disagree

The data from the questionnaire shown in Table 3 indicate that the students strongly

agreed that they could use 7 functions of Edmodo quickly and easily. They also strongly agreed that the website never failed. Moreover, they agreed that they could vote and download files easily and quickly, respectively.

### 5.3.2 Opinions towards Using Edmodo

Table 4: Opinions towards Using Edmodo

| Items  | $\bar{X}$ | SD   | Level          |
|--|-----------|------|----------------|
| 1. like using Edmodo                             | 4.46      | 0.63 | Strongly agree |
| 2. enjoy using Edmodo                            | 4.35      | 0.70 |                |
| 3. pleased with doing the quizzes                | 4.35      | 0.74 |                |
| 4. like submitting work and get feedback         | 4.30      | 0.66 |                |
| 5. like reviewing lessons posted by the teacher  | 4.33      | 0.67 | Strongly agree |
| 6. pleased with posting their work to class      | 4.33      | 0.68 |                |
| 7. pleased with studying the work of other teams | 4.23      | 0.69 |                |
| 8. enjoy voting                                  | 4.33      | 0.70 | agree          |
| 9. happy with consulting the teacher personally  | 4.20      | 0.82 |                |
| 10. like having an online class via Edmodo       | 3.94      | 0.82 |                |

Note: 4.21-5= strongly agree, 3.41-4.2= agree, 2.61-3.4 = neutral, 1.81-2.6= disagree, 1-1.8= strongly disagree

Table 4 shows that the students strongly agreed that they liked and enjoyed using Edmodo; they were pleased with doing quizzes; they liked submitting their work, getting feedback from the teacher, and reviewing the lessons posted by the teacher; they were pleased with posting their work to class, and studying the work posted by other teams; and they also enjoyed voting for the best work of their classmates. Moreover, they agreed that they were happy with consulting the teacher personally, and having an online class via Edmodo.

It is also important to point out that there is a small distribution of the data, according to the SD (Standard Deviation) in Table 3 and 4. Therefore, it can be seen that the perceptions on technical and learning aspects towards an online class through Edmodo of the three groups of students (1

young engineering group, 1 young IT group, and a group of adult education learners) were not much different. Consequently, the researcher believes that teachers can try using Edmodo as an online learning platform with other types of students.

### 5.3.3 Problems and Suggestions

According to the answers to the open-ended questions of the questionnaire, the students revealed two crucial problems: no training, and no function for students to send a message, file, or link to their individual classmates. For the former problem, it resulted from the teacher's over-expectation about students' digital skills. Since all her students were technology education, engineering, and information technology students and 97.53% of them including the adult learners used Facebook, she believed that they were able to learn how to deal with the website themselves. For the latter problem, the researcher thinks that Edmodo will modify this function later. The students also suggested an excellent idea of expanding the use of Edmodo to other English courses and adding more quizzes for practicing English outside class.

## 6) CONCLUSION

The most important finding of the study is that Edmodo is a wonderful social learning platform which is so simple that even a non-digital native teacher can use it happily and successfully without any need for help or support from a computer technician. Though she learned how to use most functions in a problem-solving style, she could overcome those problems easily since the website provided a 'help' mode, a webinar, and an FAQ, including a mode for asking questions which users can reach at [support@edmodo.com](mailto:support@edmodo.com). Moreover, the very positive perceptions of both the teacher and her students motivate the researcher to believe that Edmodo can be used as an additional online classroom

community for other types of learners. However, a brief demonstration and training on Edmodo may still be needed.

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## Smart e-Learning Through Media and Information Literacy

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### ABSTRACT

In the past decade, Thailand has been one of the pioneers to stipulate national Information Communication Technology (ICT) policy frameworks for the investment, development and implementation of ICT. The goal is to lead the country toward a knowledge-based economy and society. In this paper Strategy 6 of the ICT 2020 Policy Framework is addressed and questions are asked on whether providing ICT infrastructures in education is enough to achieve social equality, quality lifelong learning and create fair economic, social and cultural opportunities in Thailand. The paper also engages with the debates that rise when merging technology and education. A transmission model of learning, one based merely on traditional paper-based culture is juxtaposed with a Smart e-Learning model of learning where students and teachers interact transversally with technology and engage with internet and media culture.

When discussing the relationship between technology, education and development one must not fall into technological determinism. Bringing ICT to the classrooms is not a synonym for quality lifelong learning. We believe that a Smart learning plan of action must integrate Media and Information Literacy (MIL) skills with e-Learning and ICT because it is not enough only to teach the technical skills. One must also research the relationship between technology and user and teach about the role of ICT in transforming society, knowledge, culture and literacy. The OneTablet per Child project that became effective this year in

Thailand will be used as a case study to follow the changes and transformations in learners' literacy skills and competencies.

In attempting to explain frameworks such as ICT, e-Learning and MIL, it is believed that an integrated approach that engages learning as a 3-phase journey can be utilized where ICT is envisioned as the departure point, e-Learning as the journey itself and MIL as the destination to be reached. The goal is to empower learners with the new literacy skills that will enable them to evaluate the quality of information, understand the functions of media, critically engage media content and effectively use ICT for self-expression.

### Keywords

e-Learning, ICT 2020 Policy Framework, Information Communication Technology (ICT), Media and Information Literacy (MIL), OneTablet per Child, Smart learning

### 1) Introduction

With the formulation of the *ICT 2020 Policy Framework* and the recent *OneTablet per Child* project, Thailand has shown much interest in Information Communication Technology (ICT) and its potential to lead the country toward a knowledge-based economy and society. However, there are still ongoing debates on which strategies to adopt in order to implement ICT in Thailand and ensure that it will be used to create a lifelong learning networked society. In particular, this paper zooms on *Strategy 6* of the ICT 2020 Policy Framework (ICT to enhance social equality). The aims of this strategy are to

secure people's rights to access and make use of telecommunications services and information in order to create fair economic, social and cultural opportunities in Thailand.

The recurring debates on merging technology and education are also addressed. Many educators and parents take a protectionist stance (Kellner, 2007) when it comes to e- Learning and bringing technologies within the classroom. This stance exalts traditional print culture over digital and media culture and presumes learners to be incapable of negotiating media messages. Media manipulation and addiction are stressed more than learners' capacities to re- invent media culture and provide alternative or oppositional readings. In telling his experience of tablets use within the classroom, Chalermchai Boonyaleepun, president of Srinakharinwirot University clearly shows his protectionist stance. He declared, "Tablets used in our pilot project in Grade 1 are not accessible to the Internet. The students learn only content provided by the school. Schools (with students using tablets) do not need to have Internet access and there should be no concern that the tablets will be used for wrong purposes" (In Wilson, 2012). This protectionist approach to tablets does not make the technology different from the books (print culture) that schools have used until this day. The fear of the Internet denies the potential of the latter to become an interactive learning space. Not connecting tablets, thus, denying Internet use to children, will not solve the problems Thai people are facing in education, nor will diminish the fears and risks that exist when using new technologies. Giving tablets to children and preventing them from access to the Internet and media culture will annihilate the empowering potential of ICT in education and reiterate the highly contested transmission model of learning.

In the digital age it is unthinkable to maintain the same paradigm in

education that has worked for the past generations. Children actively engage with media culture; therefore, the latter must be inserted within school curriculum and teachers must be trained to teach popular culture via the tablet. As Carmen Luke (1999) maintains,

The media texts of popular culture that people are exposed daily, are the very texts that help shape their understandings of social inequalities and equalities, differently valued cultural resources and identities, and differential access to various forms of social power. Everyday media texts are therefore eminently suitable for teaching about social justice in contemporary cultural contexts. (p. 624)

A transmission model of learning that relies merely on "book culture" is unsuitable with the new generation of learners mostly because it does not teach them the skills and knowledge they will need in the world outside of the classroom. As an adjunct voice to the debates on e- Learning and ICT in education occurring in Thailand and in the world, this paper suggests Media and Information Literacy as a set of guiding skills for teachers and learners who engage new technologies and media culture in the classroom.

## **2) Integrating New Approaches in the Learning Environment**

Strategy 6 of the ICT 2020 Policy Framework advocates for *smart learning* to achieve its goals but nor defines the meaning of the latter or provides skills and a plan of action to promote it in Thai society. Professor Dae- joon Hwang (2010) explains that "Smart" learning should be "a flexible learning intensifying competence of learners on the basis of changes in behaviour through leveraging Open Educational Resource, smart IT, and

international standards". In this paper we argue that in order to fulfill some of the objectives of Strategy 6, an interdisciplinary Smart learning plan of action must be promoted.

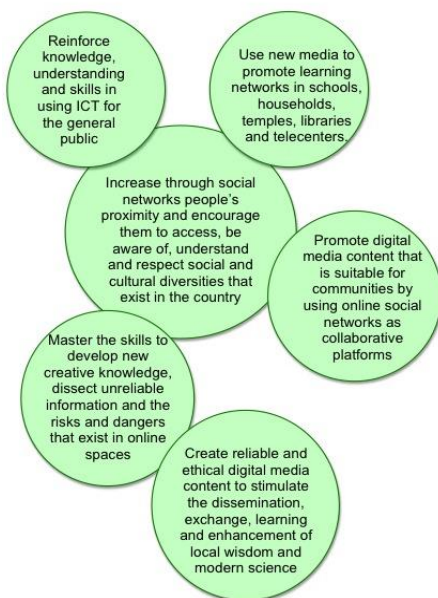


Figure 1: Objectives of ICT 2020 Strategy 6

Simply providing ICT will not teach learners the skills to cope with the convergent world they live in. One must also teach about the mediating role of ICT and its impact in transforming society, knowledge, culture and literacy. Moreover, the relationship between technology and user must be investigated, as well as the new ways one thinks, teaches, learns and connects with others. To reach the objectives outlined in Strategy 6, a Smart learning plan of action that integrates Media and Information Literacy with ICT and e-Learning must be endorsed.

### 2.1) The OneTablet per Child Project and the Need for New Literacies

The OneTablet per Child Project that became effective this year in Thailand aims at fulfilling some of the objectives mentioned in Strategy 6 of the ICT 2020 Policy Framework. Great attention was

given in first place to the technological medium (the tablets). As a consequence, the unpreparedness of teachers and the lack of skills to make the best use of ICT in education gave rise to divergent and disparate opinions concerning the pros and cons of bringing tablets within the classroom. Some have argued that giving tablets to young students is an imperative for those who are growing up digital and will become the new workforce of the country. However, many academics are still skeptic about the role that tablets will take in supplementing education. Maitree Inprasitaha, dean of education at Khon Kaen University brought up issues concerning the lack of e- books, software for learning and training programs for teachers. Other voices made it clear that before bringing tablets within classrooms, the 1.6 billion baht education budget must have been spent on curriculum development (In Khaopa and Saengpassa, 2011). Sompong Jitradab, a lecturer at Chulalongkorn University's Faculty of Education and member of the education policy reform, expressed his concern for young people using tablets to play games, with only a minority using them for learning.

Other concerns have been addressed in the study led by Lim and Soon (2010) on Chinese and Korean mothers' standpoint in relation to the adoption of ICT in the household. Chinese and Korean parents are very involved and committed to their children's education and academic achievement; success is strongly related to family status. This study has shown that in the digital era, parents are facing dilemmas when it comes to supervising school -work and setting rules and restrictions for ICT use in the household. Mothers acknowledged the educational value of new media, they were aware that ICT is critical for one's advancement in society and were attentive not to isolate their children from their peers and from popular culture. However, both parents and academics rarely acknowledge

that learning also occurs when children play, experiment and create with new media.

In the twenty-first century mediated world, it is faulty to understand literacy as the mere ability to read and write. The concept of literacy has been expanded to embrace those social and cultural skills that people need when they engage with new media in the participatory culture. Henry Jenkins explains (2006) that these new skills (play, performance, simulation, appropriation, multitasking, distributed cognition, collective intelligence, judgment, transmedia navigation, networking, negotiation) do not suddenly sprout out from nowhere; rather, they find their roots in traditional literacy, research skills, technical skills, and critical analysis skills taught in the classroom. Indeed, they are the result of convergence and remediation. In addition, David Barton and Mary Hamilton (1998) maintain:

[Literacy] is primarily something people do; it is an activity, located in the space between thought and text. Literacy does not just reside in people's heads as a set of skills to be learned, and it does not just reside on paper, captured as texts to be analyzed. Like all human activity, literacy is essentially social, and it is located in the interaction between people. (p. 3)

As such, it is anachronistic in the digital era and now that tablets have been given to students to limit teaching to traditional literacy skills, book culture and the classroom. Smart e-Learning through play, social interactions, experience, dialogue, participation and sharing must be embedded in school curriculum.

### 3) Understanding Frameworks

Embracing smart e-Learning presupposes a shift in people's traditional view of technology to an understanding of

the democratic potential of ICT in education. Despite the fact that no universal and fixed definition of ICT, e-Learning and MIL exists, this paper acknowledges that explaining the three frameworks and their integration is an important step to make the shift happen. To better understand the necessity for integrating MIL with ICT and e-Learning, we will refer to Anderson's (2010) vision of e-Learning as a three-phase journey. While ICT provide the vehicle to embark for the journey, e-Learning is the moment where learners and teachers interact with each other and with culture and through MIL skills engage problem-solving as teamwork. Finally as the destination to be reached, learners are encouraged to bring into the world the skills acquired during the e-Learning process and collaboratively create, innovate and invent. For smart e-Learning to occur, the three frameworks must be integrated.

#### 3.1) *Information Communication Technology (ICT)*

Hamelink (1997) envisions ICT as the ensemble of communication technologies that can:

Process different kinds of information (voice, video, audio, text, data) and facilitate different forms of communications among human agents, among humans and information systems, and among information systems. These technologies can be further subdivided into capturing, storing, processing, sharing, displaying, protecting, and managing technologies. (cit. in Chowdhury, 2000, p. 6)

This framework is particularly useful in that it displays the ways in which ICT (as facilitators) are the departure point of Anderson's vision of learning as journey. When discussing the relationship between

technology, education and development one must not fall into technological determinism and assume that bringing technology to the classroom will annihilate the existing digital divides and social and economic disparities. ICT have indeed revolutionized the ways in which people gather, process, exchange and display information; however, without the integration of skills and practices that critically scrutinize the social relationships that bring these technologies into existence and without fostering a deeper understanding on the politics of meaning, how knowledge is produced and transmitted, by whom, for which interests and to which audiences, the potential of ICT to fulfill quality lifelong learning and social equality will be used only partially.

### 3.2) *e-Learning*

E-Learning is envisioned by Anderson as a journey; the moment where through ICT, training and horizontal interactions learners may become familiar with the skills that will allow them to become critical cultural readers and producers of culture. Elliott Massie explains:

E-Learning means more than digital on-line transmission of knowledge, or computer-based training through the Web. The “e” in e-Learning refers to two essential components: the experience of learning as well as the electronic technology. The meaning of e-Learning includes both the technology and the type of learning.

This definition reinforces the importance of the relationship between medium and user, communication infrastructures and content, and of valuing the experiential and participatory dimensions of learning. Professor Rob Koper (2004) perceives e-Learning as the organization of learning

networks for lifelong learning where learners are connected both technologically and socially to other human beings and to the information that they exchange. However, having the technologies that allow to access resources and engaging in on-line interactions is not enough. As Yam San Chee maintains, “simply enabling ready access to pertinent information, even instructional information, need *not* necessarily entail learning or education. Overcoming the difficulty of access via technology only solves the easy part of the education problem. Achieving learning is a harder challenge” (cit. in Shih, 2004, p. 296). Media and Information Literacy trainings must be brought within the classroom because using ICT to teach is just one aspect of the e-Learning process. Skills are needed to teach about the ways ICT shape and change the knowledge that we produce, the new social relationships that spring out from e-Learning, new identity formations, and the changes in language and literacy practices brought by new media.

### 3.3) *Media and Information Literacy (MIL)*

UNESCO (2011) uses the term *Media and Information Literacy* to recognize the importance of locating and evaluating the quality of information, understanding the functions of media, critically engaging media content and effectively using information communication technology for self-expression.

The following figure maps out the skills of Media and Information Literacy and the outcome of their merging:

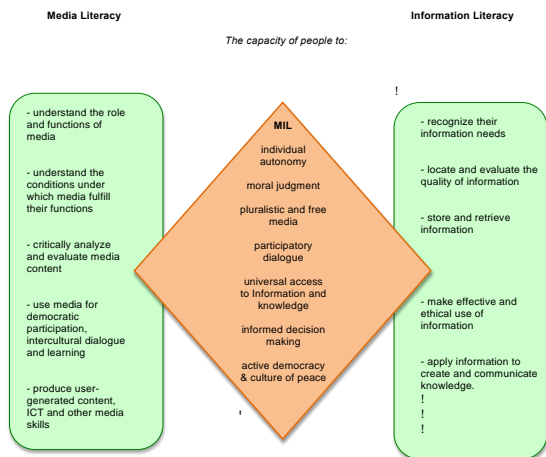


Figure 2: Media and Information Literacy Framework

The importance of including Media and Information Literacy skills within the discourse of e-Learning and ICT development and implementation is due to the fact that “we are moving away from a world in which some produce and many consume media, toward one in which everyone has a more active stake in the culture that is produced” (Jenkins, 2006, p.10). Therefore, the widely stressed importance of learning the technical skills on how to use ICT must be equated to the importance of teaching how through those technologies learners may become critical consumers of media and information and responsible cultural producers. MIL is not only part of Anderson’s journey, but also the destination to be reached. The goal is to encourage people to fully be aware of their rights of free expression, defend their access to information, critically evaluate content, participate in decision- making processes and make their voices be heard. The “e” –learning process must require learners to engage with the new literacies available to them in the digital culture and expand their critical consciousness to take action within the world.

#### 4) Why do We Need Media and Information Literacy?

One of the promises and intentions for bringing ICT within the classroom and

establishing e-Learning programs is to diminish the digital divisions that exist both between and within countries. The Organization for Economic Co- operation and Development (OECD) defines digital divide as “ the gap between individuals, households, businesses and geographic areas at different socio- economic levels with regard to their opportunities to access information and communication technologies and to their use of the Internet for a wide variety of activities” (2001, p.5). This definition draws attention to two related aspects of digital divisions –*access* and *use*. Strategy 6 of the ICT 2020 Policy Framework proposes to provide and distribute equitably information infrastructures across the country as one solution to deal with the issue of digital divide. In line with the framework, Thailand has launched the OneTablet per Child project equipping schools and primary school Thai students with tablet PC’s and free WiFi. This is indeed an important initiative for the country; however, one must not ignore the fact that more than 2000 schools without adequate facilities and electricity and whose teachers are unable to make use of these technologies are still part of the digital divide and were not eligible for the OneTablet per Child project. Monitoring the project closely and ensuring that tablets will be brought to every strata of the population is a priority for Thailand. Not of lesser importance, children equipped with the technology must be trained with the necessary skills that will allow them to participate fully in public, community and economic life.

As it was argued by the International ICT panel (2007), “the digital divide should no longer be defined only in terms of limited access to hardware, software, and networks, but rather, one that is also driven by limited literacy levels and a lack of the cognitive skills needed to make effective use of these technologies”. Indeed, one can no longer limit the discussion to issues of access. This paper

suggests that Media and Information Literacy trainings must be adopted by the ICT 2020 policy framework as a strategy to face the issue of digital divide understood as limited literacy levels and lack of skills in how to effectively use new media and ICT. Merely paying attention to people's access to basic ICT services will not reduce socio-economic inequalities. A Media and Information Literacy framework that connects the social relations and exchanges occurring in virtual communities and the economic, political, social and cultural dimensions of real life will be key in building a united yet heterogeneous active and informed citizenry.

### 5) Conclusion

As it is outlined in the ICT 2020 Policy Framework, Thailand is increasingly opening its doors to implement ICT to foster a stronger economy, social equality, smart learning and environmental friendly practices. Strategy 6 of the framework emphasizes the importance of reaching social equality and decreasing through ICT in education and e-Learning the strong digital divides that exist in Thai society. This paper argues that providing information communication technology infrastructures is just the first step to reach the framework's goals. During the e-Learning journey, teachers must provide learners with Media and Information Literacy skills that will enable them to engage with knowledge in an interdisciplinary way. Using moral judgment when engaging new media, being critical about information, scrutinizing the systems that bring knowledge into existence and participating in collaborative learning networks will both prepare learners to enter the workplace and respond to the demands of the economy, and allow them to become informed decisions' makers and builders of an active democracy and culture of peace.

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## **Developing Multi-literacy Skills in e-Learning Environments using Tablet Computers at the Primary Grade Level in Thailand**

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### **ABSTRACT**

The scope of this paper integrates two major elements which are becoming increasingly apparent and necessary to consider with the deployment of tablet computers at the primary grade level throughout Thailand. First and foremost is the educational impact of introducing the tablet computer into the classroom and secondly the multiple literacy skills and behavior patterns that are being learned by students when they access information using tablet computers. The rapid growth of mobile digital assistants, including not only tablet computers but also iPADS, IPODS, IPHONES and even newer hybrid tablet computers, which have laptop functionality, are drastically changing student behaviors in how they interact, relate and access information. When students are first exposed to these digital assistants they immediately develop new literacy skills and behavior patterns resulting from accessing and manipulating information. These new literacy skills and multi-tasking capabilities emerging within these new e-Learning environments will require a familiarity by the teacher on how these digital assistants are impacting the learning process on both young and adult learners alike. This paper will indicate what these new literary skills are and why it is necessary for the teacher to monitor how students are using the tablet computer to achieve the learning objectives set out in the curricula. The phenomenon of acquiring multiple literacy skills as well as multi-tasking behaviors stems from the use of tablet computers and will necessitate a re-evaluation by educators on how young

learners are interacting with information. Consequently, the way in which these interactions relate to learning objectives will need to be looked at more closely by both teachers and curriculum planners alike to leverage and apply the students newly acquired literary skills to the learning process.

**Keywords:** Digital literacy, e-learning, learning behavior, Multi-literacy skills, Tablet computers, Teacher training, Digital pedagogy

### **1) INTRODUCTION**

Classrooms throughout the world are undergoing radical changes in how students go about learning the content of subjects which were traditionally taught using learning theories based on models which stemmed from text based instruction methods. Students today are able to seek out information independently from their teachers and see a world presented to them as never before possible from a traditional text based classroom. There is no question that the personal computer introduced for the masses in the early 1980's started an educational revolution which few educators were prepared for. Today, in the early part of the 21<sup>st</sup> century, the escalation of innovation in information technologies has surpassed even the best forecasts as to what would be possible with computing technologies. All the innovation in the last thirty years has brought to our world today a handheld device capable of communicating with every library, every institution of learning and anyone who has an email address. The world is now connected by a vast network of fiber optic cables bringing to anyone, almost instantly, information

about any subject developed by the human mind. Coupled with the speed which innovation is advancing a more staggering amount of research and knowledge about how our world works eclipses the best planned computer storage technology to house our collective insights and inventions. To be literate today means to understand how to manipulate the digital pathways which support human cognition. The knowledge revolution requires a re-thinking on the part of educators to understand how students in a classroom setting access this digital landscape. Students have before them a data highway that can provide a new way to become aware and also implement that awareness into useful and sustainable activities. Consequently, 21st century digital literacy is the area that this paper will explore where an ongoing technological revolution is advancing each day demanding diligence and scrutiny as to what learning is all about.

## **2) LITERATURE REVIEW**

The primary focus of this paper is to explain the changes that are taking place with how students learn with tablet computers. This includes digital literacy skills as well as multiple literacy skills. The other focus is the change being brought about in classroom management and how teachers are working with students using tablet computers so they can learn the lessons specified in the curricula. So, the two issues are; Digital literacy skills and Classroom management using tablet computers. These concerns also exist within all educational institutions worldwide and are being dealt with in unique and creative ways. At Cornell University they ask the question on how to create curricula to engage students in what they know, with the information resources and communication tools that they commonly use, and translate those skills into critical abilities for exploring, interpreting, and participating in an increasingly complex globalized community (Carlacio, and Heidig, 2009). The question is always what digital literacy is and how different it is from

traditional literacy skills gained from reading and writing. Gunther Kress in his work *Literacy in the New Media Age* says that digital literacy must include communication across media to include screen, image, and page (Kress, 2003). What this means is that text today incorporates sound, image, video and many different forms of written texts which is located in different areas requiring a new definition of literacy to encompass multiple literacy whereby these different media are being accessed to formulate an idea or an opinion.

Essentially what we have in Thailand is the implementation of tablet computer technology into the early grade levels without an adequate teacher training program which allows a teacher to help a student scaffold his/her experiences in preparation for the next level in cognitive development. This area is known as pedagogy and developing a “digital pedagogy” with the use of tablet computers is an entirely new discipline that educators need to become aware of (Valstad, 2010). Ultimately the goal in digital pedagogy is to have the student gain the skills and knowledge to read and interpret the text of the world and to successfully navigate and negotiate its challenges, conflicts and crises (Kellner, 2012). However, the teacher has to be closely involved in these new multiple literacy’s which students today find easier to negotiate than do their older counterparts i.e. the teachers. The dialogue that is now being expanded with regard to digital literacy or information literacy is how teachers can be more effective in supporting student transfer of traditional literary skills within the new e-Learning environments that will soon be populated with tablet computers. What lessons can a teacher implement in the early grades using a tablet computer which will develop those necessary transfer skills that enable a student to make overt connections with information or show how links can be made to related information (Perkin and Solomon, 1992)?

The other issue to be taken into consideration is incorporating a learning theory that can be integrated into digital pedagogy. This paper does not have the space to explain how digital pedagogy is implemented with a lesson plan. However, an example of how apps can be integrated into the lesson plan will be briefly discussed below. Tablet computers although they operate similarly to a laptop computer and desktop computer do not employ the type and click interface to access information. The tablet computer uses a touch and swipe interface to access information and engage in apps designed specifically for the tablet computer. What this means is that the stages of cognitive development using a tablet computer incorporates many different feedback conditions with the use of the app; applications that are resident on the tablet computer. When a learner, in the early stages of their cognitive development, has a way to use images or sounds to define the world they are experiencing then that world is quite different from a picture on a static page that is not animated or capable of having music or speech associated with it. The difference is one in which the learner is immediately rewarded with a new picture or a new sound, which is being called Learning in Action (Barnett, McPherson and Sandieson, 2012). This Learning in Action theory is called Connectivism which helps develop new connections (neural, social or academic) more than remembering facts, ideas or concepts. According to Barnett et al. (2012) networks (whether human or electronic) are the basis of knowledge. How these connections between picture and sound are used to help a student learn is the basis for digital literacy.

What is 21<sup>st</sup> Century education, and is it necessary to dramatically re-examine the foundations by which learning theories have thus far been implemented? 21<sup>st</sup> century skills have been divided into seven survival categories (Wagner, 2008) to address a student's exposure to a highly connected world which includes:

- \* Critical thinking and problem solving
- \* Collaboration across networks
- \* Agility and adaptability
- \* Initiative
- \* Effective oral and written communication
- \* Accessing and analyzing information
- \* Curiosity and imagination

These are broad categories to be sure. A lengthy paper which would explain these 21<sup>st</sup> Century survival skills and how they are used in tandem with teaching is not possible at this point. What follows is an example of how a teacher can become aware of how to effectively use the tablet computer in the classroom without fear of thinking it is beyond his/her grasp. To date there are many support groups and examples on how to achieve a successful e-Learning environment. Hopefully the areas covered will help a teacher and ultimately the student as they embark on a new road using digital assistants.

## **2.1) Learning with a tablet computer**

### *2.1.1 Web2Thai Foundation*

The Web2Thai Foundation, [www.web2thai.org](http://www.web2thai.org), an independently funded effort in Thailand, supplied iPADs to primary school children in rural areas in Si Saket province in 2011 resulting in an evaluation report on the experiences of both students and teachers in adopting tablet computers in an e-Learning environment (Sprogoe, 2012). The goal of the Web2Thai Foundation was to strengthen the abilities of children to study, read, solve tasks on their own and progress quickly in English. The findings support the thesis of this paper which states that classroom management and digital literacy skills are the two most important aspects to consider when adopting tablet computers in the early grades. Student satisfaction with using the tablet computer was indicated in several key areas;

- a. The tablet computer made the kids pay more attention in the classroom because it increased their concentration.

- b. The tablet computer prevented boredom with learning and improved the student's skills in either playing games or solving simple problems.
- c. It helped the students become familiar with new technology which encouraged creativity.

However, the use of the tablet computer in the classroom did cause some concern with the teachers. These concerns focused around the following areas;

- a. Teachers could not readily see the benefits of the application on the tablet computer.
- b. Teachers had problems learning what was on the tablet computer.
- c. Teachers had problems using the apps in the classroom because they had insufficient time to try out how the apps work.
- d. The tablet computer was not part of a structured lesson plan so teachers did not know how to integrate it into their lessons.
- e. Teachers did not know how to find the appropriate app for their lessons.

From these comments on the use of the tablet computer in rural areas where little exposure to technology is available it can be seen that a short introduction to apps is essential and further explanations are needed on how these apps can be successfully incorporated into a lesson plan.

### *2.1.2 John D. and Catherine T. MacArthur Foundation*

This American based foundation launched the digital media and learning initiative in 2006

to explore how digital media are changing the way young people learn, socialize, communicate and play (MacArthur Foundation, 2009). It is recognized that there is an ongoing shift in the way children learn. Digital media allows a style of learning that is less about consuming knowledge and more about interaction and participation. The majority of administrators

of educational institutions who participated in the MacArthur Foundation's workshops claim that tablet computers and all mobile learning devices are beneficial for increasing student engagement in school and in learning.

### *2.1.3 Centre for Research in Education and Educational Technology - Open University, UK*

The key issue all educators are faced with is coming to some agreement as to what digital literacy is and how digital technologies should be introduced into the classroom so the students are actually benefiting from the technology and the learning process is enhanced. At the Open University in the UK (Kucirkova, 2011) is exploring the potential of iPADS to enhance young children's early literacy learning. Also being studied is what opportunities iPADS offer for early literacy development in a digital age, and whether there are any advantages in using touch sensitive screens with young children.

### **3) Digital Literacy**

The most important consideration when starting a child's education with digital assistants and specifically the tablet computer is to recognize that the child will adapt immediately to the functionality of the tablet computer independent from what the teacher knows about it. The child will explore all the functionality of the tablet by passing their fingers over the surface of the tablet screen. At this early level of education the question must be asked as to what is the basis for learning using a digital tool. According to (Markless and Streatfield, 2011) combining a constructivist approach to learning, linked with the experiential learning cycle, was found to be the most productive approach. The question is how you structure those findings into the classroom and in particular structures suitable for primary school teachers so the research findings can be used effectively with the students. This "how" aspect of using tablet computers in primary education

is a question on all teachers' minds. How do we do it? How do we introduce apps at an early grade level which will usher in the beginning stages for a child to learn digital literacy techniques that can be scaffolded throughout their learning cycle in the primary grade levels? At the very early stages of learning with a digital assistant the way in which tasks are completed on the tablet computer has an inherent effect on how a child will learn what is possible and what isn't possible when they are performing an activity. The child is immediately learning skills which can be transferred later to other activities (Perkins and Salomon, 1992). Not only is scaffolding important, introducing more complex assignments which build on what the child has learned, but also introducing links to another activity that has similar problem solving requirements. Puzzle apps are very good examples of transferring the skill gained from matching and manipulating shapes to matching shapes in a puzzle to create pictures such as those in the app called *PuzzlePlanet*. The picture puzzle can be solved easier by transferring the matching skill gained from the previous app called *Injini* which has many shape matching activities. Literacy skills using the tablet computer have profound implications for developing more complex symbol manipulation. Transferring one skill from one app activity to another app activity allows the student to make associations in areas outside of their familiar play area. These basic activities help develop cognitive frameworks to help ask critical questions based on seeing how to solve a problem or even make hunches (guesses) which are dependent on intuitive judgments and the ability to make inferences when solving problems with newer apps..

### *3.1.1 Cognitive development*

In Jean Piaget's cognitive development theory for children, from the ages of 2-11, there are two major cognitive stages of development. These stages are called the preoperational and the concrete operational.

It is in the preoperational stage that language, memory and imagination are developed, and in the concrete operational stage a logical and systematic manipulation of symbols related to concrete objects is developed (Wood, Smith, and Grossniklaus, 2012). This short introduction on cognitive development coupled with the necessity for teachers to be trained on tablet computers are two essential steps to effectively teach children using a tablet computer. The teacher needs to be an effective coach to help develop digital literacy skills for the young students when the table computers are introduced throughout Thailand's primary school system. The first task in this new e-Learning classroom is to provide the apps which will encourage the child to want to be curious and get involved in an activity which will set up cognitive behavior patterns, which can then be built upon by the teacher to bring the child into the next stage of higher order symbol systems.

Let's assume an appropriate learning methodology has been selected to be used in a child's early stage of learning. This could be an Active Learning application (Van de Bogart, 2009), Vygotsky's Zone of Proximal Intervention (Chaiklin, 2003), or even following Piaget's Stages of Child Development Wood et al. (2012). The ultimate goal is to enable a child to experience a progression of skill levels in order to learn higher order logic and symbolic manipulation that is inherent in language learning as well as in mathematics. Cognitive development at a very early age is being able to help the child gain agility and dexterity in making associations in the experiential world using apps on the tablet computer. I am not excluding the use of non-tablet school materials. I am only focusing on the initial interface of a child using a tablet computer.

### *3.1.2 Selecting appropriate apps for the children*

From the results of the Web2Thai evaluation study it was shown that the teacher had a

problem integrating apps into the lesson plan. One difficulty is in selecting an app that will satisfy the particular learning stage the child is currently at. The selection of apps can either be done beforehand by the teacher or the teacher can use online support such as the apps found at [www.forum.ikidapps.com](http://www.forum.ikidapps.com), [www.lear.org](http://www.lear.org), <http://momswithapps.com> or [www.appshopper.com](http://www.appshopper.com). We have to keep in mind what the teachers said in the Web2Thai report, which was that they did not have enough time to become familiar with the apps. So we have a twofold problem in not only selecting an app that a teacher can use but also whether it can be used to help the student learn what it is the teacher has incorporated in the lesson plan. One solution is to find the appropriate app and then show it to the students and see how the students use it.

As an example let's say we select the app called "Injini" mentioned earlier located at [www.injini.net](http://www.injini.net). Project Injini is a unique collaboration of professional game developers and early childhood development specialists. The app comes with a set of activities the child can play with. One of the activities is "pattern recognition" designed on a very basic level and another activity is called "tracing" that allows the child to see the relationship of shapes to things in the real world. The app is extremely simple to understand but putting yourself in a child's position the app may appear entirely different. What is happening, however, is the child is learning how to move their fingers on the tablet surface to trace shapes and see patterns by selecting the right color or shape to match a sequence of pictures.



Figure 1: Tablet math app (Web2Thai)

This activity supports the ideas of basic cognitive development using a tablet computer. After exercises in cognitive games have been experienced by the child the next level or the next information literacy scaffolding exercise is to complete a task mirroring the cognitive exercises the child completed in the games they played. It's at this point in the learning process with using a tablet computer that a child will begin to see how their actions result in rewards for completing either a word game or simple math game. Figure 1, is an example of a math app. The student is writing numbers on the tablet screen. When the correct amount is written a reward bell will be sounded and the student will know they have done the exercise correctly. Figure 2, shows a student writing a Thai letter on the tablet. The dexterity and agility that is gained in early years can be scaffolded up to more sophisticated apps whereby the student can use the tablet to learn how to use more complex symbols and manipulate features designed into apps more easily.



Figure 2: Tablet writing app (Khaopa, 2012)

### 3.1.3 Selecting apps for a lesson plan

The next activity concerns both the teacher and the student. How does a teacher incorporate apps into a lesson plan? This is where it is very useful to have organized in a tablet folder all the apps for various activities. This is a very time consuming activity for the teacher because of the number of apps currently available. The number of apps for children is increasing in the order of 100 new apps per day so it is essential for teachers to rely on parental focus groups and other agencies that make it

a point to review all the apps that are being developed.

KinderTown is an educational app store that selects the best educational apps for children. Each app is tested and reviewed by educators and parents as well as children. KinderTown takes many factors into account when it selects apps such as ease of use, engagement value, design features, artwork, cost and shelf life (KinderTown, 2012).

#### 4) Conclusion

The areas covered in this paper briefly outline what takes place in an e-Learning environment at the primary grade level using a tablet computer. Before the teacher comes to class there should already be some understanding of the differences inherent in traditional based learning and learning with a tablet computer. This has been pointed out as the difference between traditional literacy

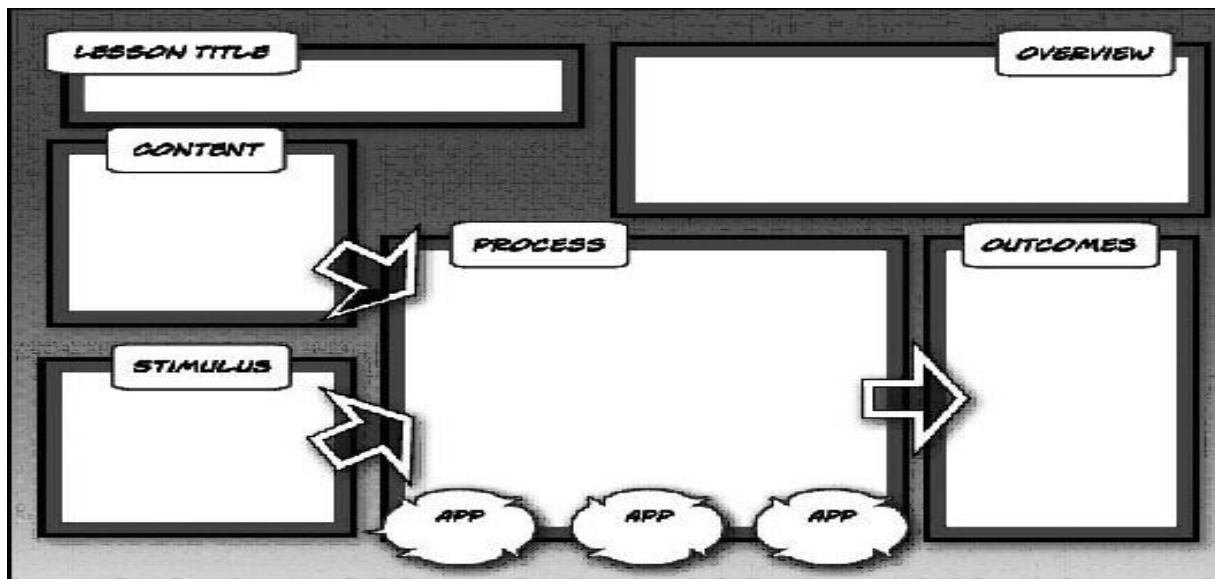


Figure 3: Lesson plan incorporating apps (Larkin, 2011)

Figure 3 is an example of a lesson plan which incorporates a place where apps can be inserted and the teacher can build a lesson plan around the app. The teacher pre-selects the app and then lets the student create with the app in which ever manner the student wants to. The teacher also decides before the app is used what outcomes are desired. The lesson plan acts like a mind map where areas are developed in which the teacher wants to have the student accomplish when using the app. The key consideration for the teacher is to allow the student to explore the content of the app freely. As the student progresses through the lesson using the app the teacher is actively reviewing apps which can be used to build on what the student has already learned.

skills based on reading and writing and digital literacy skills based on making multiple associations with the content seen on the tablet screen. Once there is some understanding of what researchers have discovered about how children learn with tablet computers the next consideration for the teacher is a learning methodology the teacher can rely on to help the child progress through the lesson plans. Each step in this process can be aided by understanding how digital pedagogy is being implemented by other schools faced with exactly the same problem, which is how to effectively use the tablet computer for learning.

I do not think there is a great deal of awareness about these issues of digital literacy with the teachers in the primary school system of Thailand. For that reason not only is it important to provide the teacher with a manual for how each app works but to also indicate there is a dramatic

difference in the way the child is approaching the learning experience with the use of the tablet computer. As the ASEAN Community becomes a reality in 2015 these issues will become even more important for consideration as other ASEAN nations have already had many years in developing a digital infrastructure for their educational systems. A digitally literate student is a by product of the 21<sup>st</sup> Century and it is necessary for 19<sup>th</sup> and 20<sup>th</sup> century models of education to be re-evaluated and re-examined. If these issues surrounding digital literacy are not met with imagination and enthusiasm an entire generation of young students will have missed an opportunity that many other nations are already implementing.

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## A Remote Automatic Control Laboratory via a Network

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### Abstract

This paper presents the experimentation of an automatic control via a local area network for control engineering classes. The DC motor is setup and used for the experiment. The techniques for design and analysis to access the remote laboratory are described. The LabVIEW program is used for communication between the experimental setup and the web server which can be directly accessed the HTML files. The remote experiment is defined two parts as the user and the server. The communication between user and server is described and the experimental results are compared between the direct control and the network control. The results are presented as the time responses which can be used for design and develop the web-based laboratories which can be used for the others remote control system.

### Keywords

Automatic control, local area network, remote laboratory, remote experiment.

### 1) INTRODUCTION

The internet is widely used and popular for the study and re such as online learning or e-Learning. For the control engineering classes, the students will learn both theory and practice. The practical techniques have several forms such as real experiment, visual experiment, and remote experiment. The visual and remote experiments are interesting and developed continuously [1], [2], [3], [4], [5],[6], [7], [8], [9],[10].

The real experimental setup for control system learning in each class may be

not enough for all students due to the cost is expensive. Therefore, the experiment should be accessed by many students at the same time. The remote control experiment is difference from the real experiment because it cannot touch. It is only real image from the real system and uses the real parameter value.

This paper presents the remote control experiment to support the control engineering classes. The experiment is operated via the computer network (a local area network: LAN) between wire and wireless. The LabVIEW program is used for designing the experiment as the server for user accesses and controls laboratory. The DC motor speed control laboratory is used for testing the time response.

The paper is organized as follows: Section 2 describes the remote automatic control including basic control system, computer network, experiment setup, and experiment accessed. Section 3 presents experiment results including the direct control, control via a wire network and control via a wireless network. Section 4 presents the conclusions.

### 2) A remote automatic control

#### 2.1) Basic control system

The primary goal of control system is to apply knowledge about how to control a process so that the resulting control system will reliably and safely achieve high-performance operation[11].

The basic control system is shown in Figure 1 which is the closed-loop control system. The reference input is  $r(t)$  which is the desired speed, the input of the process

(or plant) is  $u(t)$  which is the object to be controlled and the output is  $y(t)$  which is the motor speed, and the error is  $e(t)$  which is difference between reference input and output [11].

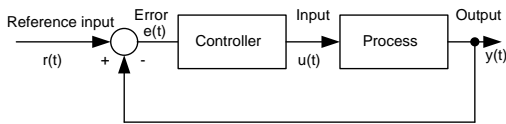


Figure 1: Control system architecture.

## 2.2) Computer network

Figure 2 shows the structure of computer network—the local area network (LAN) that connects computers and devices in a limited geographical area. This paper is used the peer-to-peer network which PC1, PC2, and PC3 are used and the laboratory PC is server.

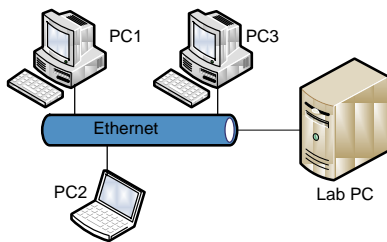


Figure 2: Structure of the network system.

Figure 3 shows the scheme of the experiment which consists of two software tools that are web browser and LabVIEW program. The communication separates two parts that are the user and server. The user uses the client computer and the server is the links between the web page and LabVIEW program through a connection via the HTTP server (a part of internet Toolkit in LabVIEW). The LabVIEW program controls the plant by using an interface DAQ[12] card when a user request the access to control the plant relies on internet browser to connect to the web server(VI server) for view the web page. The TCP/IP is used the connecting between user and server [1].

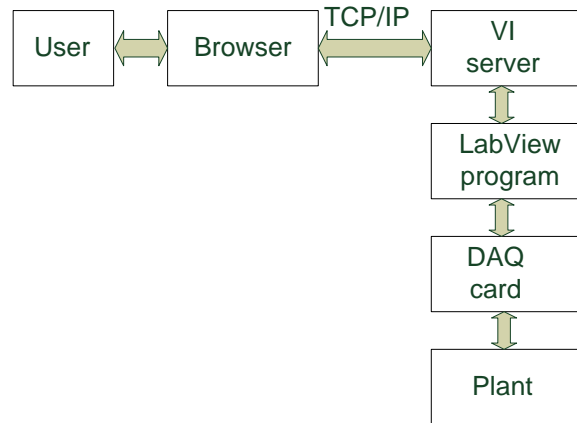


Figure 3: Scheme of the experiment approach

## 2.3) Experiment setup

Figure 4 shows the scheme of the experimental setup which consists of the DC motor setup, interface card, camera, LabVIEW server, wireless router, and PC. Figure 4 shows a wire and a wireless network by using wireless router which supports the NIC and Wifi. The baud rate of the NIC and the Wifi is 100 Mbps and 54 Mbps respectively. The LabVIEW HTTP server is the PC which is installed the LabVIEW program along with internet Toolkit. It can be connected between web page and front of VI panel. The camera is behavior monitor of the DC motor setup and an interface card (NI USB 6009)[12,13] is the data transmission between the LabVIEW and DC motor setup for speed control.

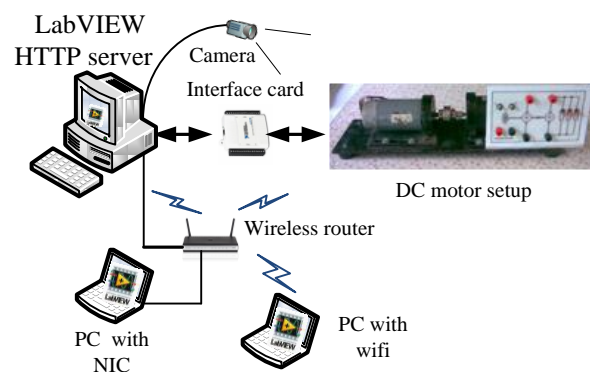


Figure 4: Scheme of the experiment setup.

## 2.4) Access to the experiment

The connection between user and server is connected to the HTTP server such as (<http://192.168.0.2:8000/DCmotor.html>). The user and the server connected to the same network. The PC (user) is installed either LabVIEW program and run time engine LabVIEW. The server is always open the VI file because it has to link between the web page and VI panel.

## 3) Experiment results

For an experiment of this paper, it is the remote control of DC motor via a small network. The time response of the system is studied. The experiments are separated by three models—direct control, control via wire network, and control via wireless network. Figure 5 shows the server of experimental setup.



Figure 5: The experimental setup in laboratory

Figure 6 shows the web page to publish from the LabVIEW. The user can request from the server by standard internet browser. The control button, the graph, and the video for the behavior monitor are shown. The user can control from this web page by use the command a request control of VI. The speed of motor is defined at 1800 rpm.

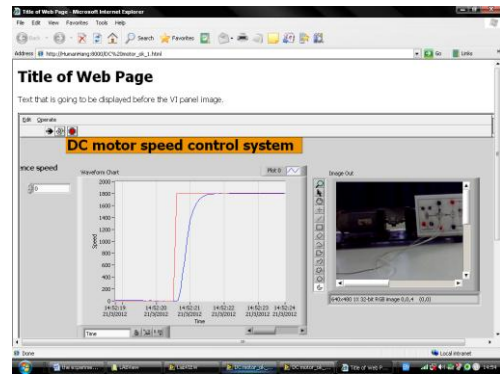


Figure 6: The web page of an experiment.

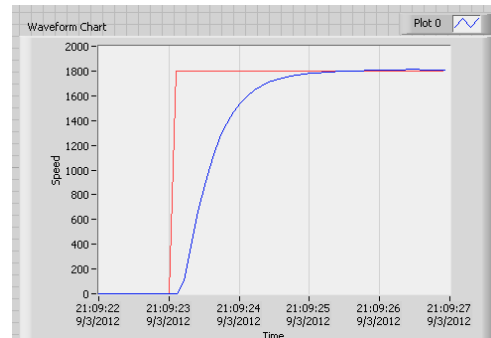


Figure 7: Direct control of the LabVIEW sever

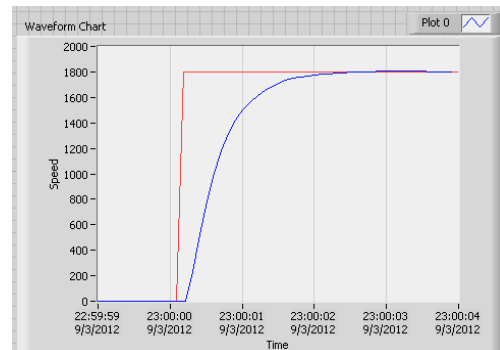


Figure 8: Control via a wire network.

Figure 7 shows the time response of the speed motor which is controlled from the server and the time response to the reference value about 2 sec. Figure 8 and Figure 9 show the time response from the user which control via a wire and a wireless network respectively. Both users have the response time to the reference value about 2 sec but the connection response time between user and server is delay about 100 msec and 370 msec respectively.

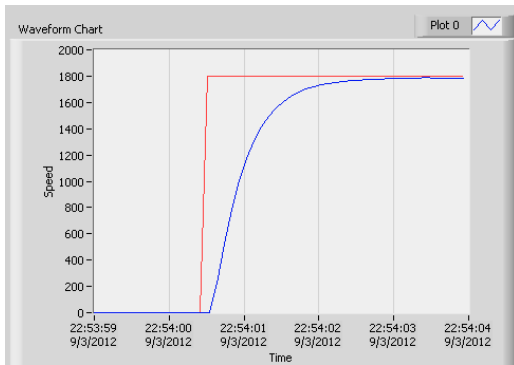


Figure 9: Control via a wireless network.

Table 1: Time responses

| Type of control                | Tm(sec) | Delay time(msec) |
|--------------------------------|---------|------------------|
| Direct control                 | 2       |                  |
| Control via a wire network     | 2       | 100              |
| Control via a wireless network | 2       | 370              |

#### 4) Conclusion

This paper presents a DC motor speed control via a small local area network which was defined as user PC and server PC. The experimental setup is to compare the response times to control the experiment setup of three models that are direct control, control via wire, and control via wireless. All three of the control gave the time response a hardly difference but gave the difference connection time because of the difference connection models. Therefore, the remote control via a network has to be considered for the security and efficiency of the system. It may appropriate for the systems that isn't require the high time response. However, it can be applied for instruction in the control engineering classes to study the behavior of the systems and the applications of the remote control.

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## Using Weblog for Innovative Teaching in Higher Education

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### ABSTRACT

**In light of knowledge management, weblogs have been used as one of viable tools in learning society. Bloggers emerges everywhere in the world. Teachers and students have utilized weblogs to enhance their teaching and learning experiences. This paper presented 1) an overview and reviewed literature related using weblogs for instructional purposes, 2) methods of utilizing weblogs in higher-education classrooms, 3) selected cases of teaching and learning management via weblog in the Faculty of Education, Suan Sunandha Rajabhat University (FoE-SSRU), and 4) achievements and obstacles.**

### Keywords

blog, higher education, innovative teaching, weblog

### 1) INTRODUCTION

A weblog (or blog) is an easily editable webpage with posts or entries organized in reverse chronological order so the most recent post appears first. Usually, a blog is the work of a single individual. The emergence of blogs in the late 1990s coincides with the advent of [web publishing tools](#) that facilitate the posting of content by non-technical users. Blogs can be hosted by dedicated blog hosting services, or on regular web hosting services, or run by blog software.

There are many different formats of blogs (Mortensen, 2008). The features depend on both the blogger and the tools provided by the blog host. Most blogs are free of charge. Nowadays, the emerging blog hosts that are popular among Thai students includes hi5, facebook, twitter, blogger, blogspot,

blogspot, multiply, exteen, etc. In 2011, the Nielsen company reported over 156 million public blogs in existence.

A typical blog combines text, images, and links to other blogs, web pages, and other media related to its topic. Most blogs are primarily textual. The personal blog, an ongoing diary or commentary by an individual, is the most common blog. Personal bloggers usually take pride in their blog posts. Blogs often become a way to reflect on life, or works of art. Blogging can have a sentimental quality.

Quality blogs are interactive, allowing visitors/readers to leave comments and bloggers to response. Thus, bloggers do not only produce content to post on their blogs but also build relationship with their readers and other bloggers. In that sense, blogging can be seen as a form of social networks.

### 2) WEBLOGS FOR INSTRUCTIONAL PURPOSES

Weblogs allow greater collaboration and sharing of resources among a community of learners. There is a wide range of externally blog hosted services to help deliver teaching materials and learning opportunities. They are ready to use after a self-registration procedure. Many of them are free of charge, either without added paid-for facilities, or with advertisements being displayed as part of their pages.

For instructional purposes, using a weblog has several advantages such as learning can be independent of time and place, instruction becomes demand oriented and participant centered, encouraging active learners, improving learners' writing and communication competencies, capturing learners' changes in thinking and ideas,

inviting collaboration, making instruction more informal, involving external people, facilitating the use of images, and reducing costs (Carlberg, 2008; Kallstrom, 2009.)

Suggestions to use weblogs in teaching include: write a description of a specific teaching unit, post class-related information such as homework assignments and other pertinent class information, post assignments based on literature readings and have students respond on their own weblogs, have students create a kind of portfolio of their work, provide examples of class works and activities, provide online readings for students to read and react, post photos and comment on class activities, publish examples of good student product, link to additional information, link with another class somewhere else in the world, etc. (Richardson, 2006; ). Moreover, weblogs have been applied in teaching of higher-order thinking skills (Chittleborough, Jobling, Hubber, & Calnin, n.d.; Zawilinski, 2009; Makaramani, 2011).

### 3) USING WEBLOGS IN HIGHER EDUCATION

Teachers in higher education use weblogs in their teaching (Arvan, 2010; Makaramani, 2011; Segesten, 2011; Sparacio & Witonsky, 2006). Blogs are used in higher education for a variety of purposes (Davis, 2007; Frankin & Harmelen, 2007; Linnard, 2011) as follows.

- *News and announcements.* This covers a variety of uses: departmental news, class news, service updates, events or the latest information on a specific topic
- *Learning journals.* Students can use blogs to support and develop their learning. They can share with a teacher or completely public. Also, the blog can be a course requirement.
- *Teaching journals.* Teachers can use blogs to reflect on their teaching experiences, keep a log of teacher-training experiences, write a description of a specific teaching unit, describe what worked or didn't work in the classroom,

provide some teaching tips/ideas for other teachers, and explore important teaching and learning issues.

- *Learning communities.* This could be a group blog for a course involving teachers and/or students using it to share information and discuss the course. Blogs provide a space for sharing opinions and learning in order to grow communities of discourse and knowledge.
- *Commentary and expert analysis.* Blogs are an ideal tool for disseminating regular commentary and opinion. Multi-author blogs in particular can provide an opportunity for improving professional communication and expanding impact.
- *Resource sharing.* Teachers and students develop blogs specifically to share resources with their community.
- *Collaborative authoring.* Blogs can be used for developing a publication. The commenting functionality allows readers and collaborators to comment on each other's text.
- *Supporting Research Projects.* A website is a common requirement for research projects. Blogs make an ideal tool for university teachers and students to record the process and disseminate outputs.
- *Personal homepage.* Blogs can be used by university staff and students as an alternative to a traditional homepage.

### 4) INNOVATIVE TEACHING & LEARNING VIA WEBLOGS AT FOE-SSRU

A major aim in universities is to produce independent learners. They are self-directed learners who are able to set their own learning goals; develop strategies and plan how to achieve those goals; work towards the goals, either on their own or with others; and reflect on their learning processes and outcomes. However, the FoE-SSRU expects attributes of both independence and group work among students. The use of weblog is another method to achieve the expectation.



At the FoE-SSRU, weblog is primarily used as an educational tool that teachers introduce to their students, then both teachers and students use it as a means of promoting learning. Weblogs have been used for teaching since 2006, mostly in courses relating to educational technology program. However, starting from 2009, all students in the FoE-SSRU are assigned to be bloggers. Before graduation, each student has signed up at least one blog for his/her learning management in a particular course. The site 'learners.in.th', providing free blogs for students and teachers, is commonly used.

The FoE-SSRU believes that educational blogging helps the student find a personal 'voice' and develop individual interests. Many individuals find that blog-writing changes their lives in a significant way by allowing them to express their ideas in a medium that appears to have life and longevity. It is also believed that blogging has a unique ability to create enthusiasm for writing and the communication of ideas as well as to empower students in conversation and learning. There are many innovative uses of blogs in teaching and learning at the FoE-SSRU as follows.

#### 4.1) Teacher's Class Blog

The teacher posts class-related information such as homework assignments, other pertinent class information, prompts for writing, online readings for students to read and react to, photos and comment on class activities, discussion topics, links to instructional media and resources, and assignments for students to carry out project-based learning tasks.

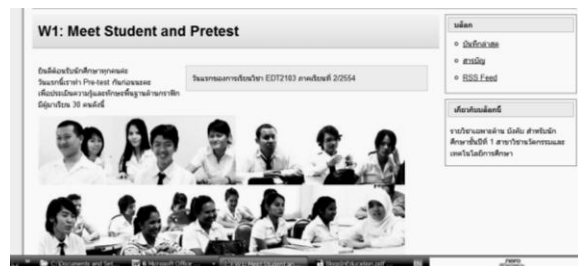


Figure 1: Teacher's Class Blog

#### 4.2) Student's Class Blog

##### 4.2.1 Class Assignment Blog.

The student is assigned to create a blog for a particular course or a particular subject or topic, then post assignments by writing reports and providing evidences in his/her blog.



Figure 2: Course Assignment Blog

##### 4.2.2 Portfolio Blog

The student writes about his/her ongoing experience in class or learning activities with sample images of his/her work and

written reflection, or showcase products of project-based learning.

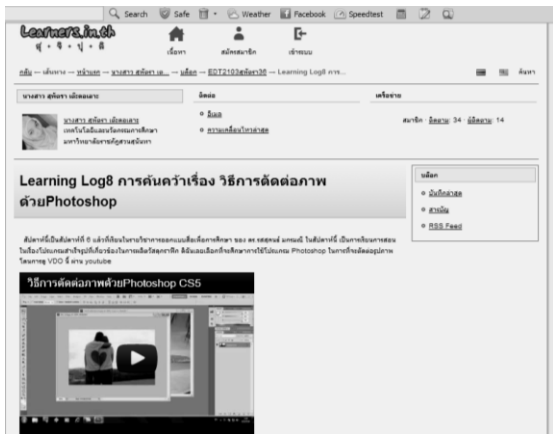


Figure 3: Portfolio Blog

#### 4.2.3 Internship Journal Blog

The student is assigned to create a blog for daily writing of experiences acquired during his/her attendance of professional internship. The blog is easily accessed by teachers and supervisors for comments and suggestion.

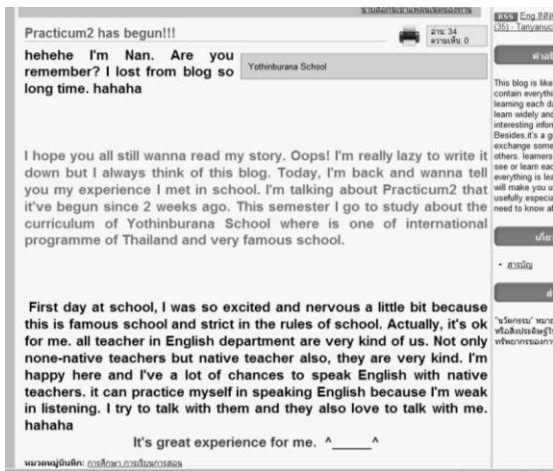


Figure 4: Internship Journal Blog

#### 4.3) Class Community Blog

The teacher creates a group blog of a particular course for easily access to individual student's blog in order to share information and discussion among class members. Also, the student creates a group blog of his/her assigned team members for communication in group working.

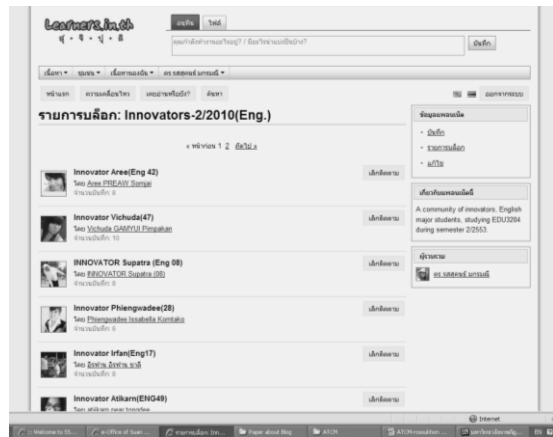


Figure 5: Class Community Blog

#### 4.4) Share Resources Blog

The students are assigned, as a group work, to develop a blog specifically to share educational resources on a selected topic of their interest to community. The students create related database system of the topic and provide linkages.



Figure 6: Share Resources Blog

Weblog is a tool for enhancing learning. Therefore, the effective use of weblog depends on systematic instructional design. The FoE-SSRU has been incorporating learning theories, especially constructivism, in management of teaching and learning via weblogs.

### 5) ACHIEVEMENTS AND OBSTACLES

After five years of using weblog in teaching of several courses in the FoE-SSRU, there are some distinctive achievements and obstacles revealed.

### 5.1) Achievements

The opportunity for collective and collaborative learning is enormous. Students have the opportunity to read their classmates' blog and those of others. The archive feature of blogging records ongoing learning that facilitates reflection. Blogging provides the opportunity for FoE-SSRU students to learn to write for life-long learning.

Weblogs provide an opportunity to teach about responsible journalism because students who are posting blogs reach an audience with their posts. The students have the opportunity in blogging to learn about the power of the published word and how proper language is crucial. They can be taught that the consequences of these kinds of remarks in the new world of the read/write web can be serious and long-lasting.

### 5.2) Obstacles

*Unequal opportunity in computer and internet access still exists among students. Misspelling and unsuitable language usage can be regularly found. Plagiarism can be detected in some student works. However, it affords to teach students about the responsibilities involved with public writing.*

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## **Blended Discrete Trial Clinical Method to Enhance Performance in e-Learning Mathematics Courses**

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### **ABSTRACT**

**In mathematics courses conducted through e-learning, a common approach in teaching and learning process is provided to all the students. Each individual has different level of fundamental mathematical knowledge or skills and this can be advantage and disadvantage to some students. Due to the nature of e-learning delivery methods where the non-existence of or minimum face-to-face contact with the learners, e-learning teaching and learning process will not be able to address this problem. In mathematics education, lack of basic skills will be a hindrance to the achievement of learning outcomes of the course. This paper will introduced a blended approach which modified the Discrete Clinical trial method. This method is used by medical personnel to teach autistic children basic skills before pursuing to main skills. The model will decompose the main skill into various sub-skills. This approach or method comprises few levels. Assessment is done through each level with the objectives to provide guidance to those who has weak grasp of fundamental skills and at the same time provides fast pace track to those who have acquired required fundamental knowledge earlier. In this model, student will be able to learn the intended skill in their own pace and according to their capabilities. E-learning will be a perfect platform to utilize this model since in conventional teaching,**

**time and variability of student capabilities will be the obstacles. This model acknowledges the capabilities of each individual and thus need to be addressed properly to enhance the learning and teaching process.**

### **Keywords**

Individual capability, Discrete Clinical Trials, Fundamental skill.

### **1) INTRODUCTION**

E-learning is the latest mode of learning and teaching today. The usage of e-learning platform such as Moodle, Blackboard does not limited to open and distant learning university, even conventional universities are using them widely. The usages of such learning platforms are more flexible in terms of accessibility to the learning material from any parts of the world and any time of the date. [5] The question raised here, are the educators or material designer are taking full advantage of this environment.[3]

The teaching and learning Mathematical courses in open and distant learning environment is a big challenge to educators.[4] The diversity of students in respect of age, working experience, fundamental knowledge and readiness to learn contribute to the challenges faced by educator. The ability of these students to absorb mathematical concepts varies greatly. [4] A traditional approach of learning and teaching mathematics might not optimize the learning of these students.

But an e-learning material can be design to accommodate students with different prior knowledge, level of fundamental mathematics concept and evaluate each individual accomplishment of learning outcomes of respective sub skills. Discrete Trial Clinical Method which is used by medical personal in teaching autisms children can be modified and blended together with the Personalised System of Instruction (CAPSI) method. CAPSI is a web based learning method. Students' performance was significantly higher for the CAPSI taught material than the traditionally taught material. [4]

In this paper, I am presenting an e-learning learning and teaching module to accommodate students with various prior knowledge and emphasis on their accomplishment of learning outcomes of each sub skills to optimize their learning capabilities. The proposed module will be a self-paced teaching and learning material.

## 2) FRAMEWORK OF THE MODULE

The proposed teaching and learning material will be divided to few sections depending on the main skills and sub-skills in the chosen topic. Each section of sub-skill will have a simple common structure as in Figure 1. The proposed structure in Figure 1 is straight forward and is a common structure. Each component of the structure will be elaborated in the next paragraph.

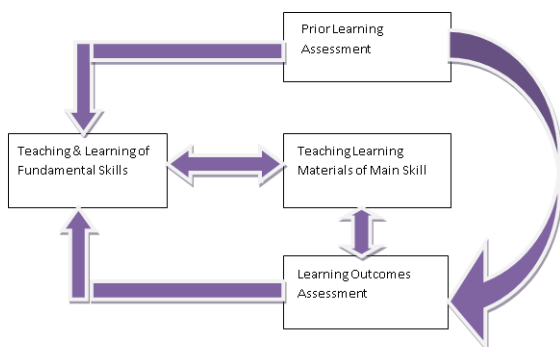


Figure 1: Main Framework of the method

### 2.1) Prior Learning Assessment

Every individual who enrolled in any courses will have a different kind or level of prior knowledge. This situation is quite obvious in ODL environment compared to conventional universities. In an ODL institution where student comes from various age groups, professions, various level of education etc.

In this component, random question will be generated from a question bank to assess the level of prior knowledge one have in that particular skill. The assessment will focus on the required fundamental skills to learn the intended skills. For example, if the main skill is Integration of partial fraction (Calculus), the assessment will focus on basic fundamental skills in various stages. The focus can be on basic arithmetic of fractions, basic knowledge on factorization of quadratic and cubic functions, integration of basic functions etc.

Student work will be auto-evaluated immediately and student will be able to see their own result. Student will be diverted to three path depends on the earlier assessment.

#### Path 1

Students who achieve 100 % in the prior knowledge assessment will be asked to take the learning outcomes assessment which will be elaborated later.

#### Path 2

Student with satisfactory level will be directed to the teaching and learning component.

#### Path 3

Student with unsatisfactory level will be directed to respective teaching and learning material of fundamental skills based on the assessment. Student will only have to undergo the fundamental skill they failed to answer in the assessment and not all the skills.

## 2.2) Teaching and Learning of Fundamental Skills

The component comprises of essential fundamental skills required to learn the main skills and these skills are also in the prior learning assessment. In each fundamental skill, tutorial will be provided in the form of teaching and learning material with learning object where applicable, working examples, videos etc. The student will go through another assessment on the fundamental skill to gauge the achievement of learning outcome of the fundamental skill. If they achieve the learning outcomes of the respective fundamental skill, they will be directed to next level of fundamental skill if required. (Based on the prior learning assessment). If not they will be directed to the teaching and learning material of the main skill.

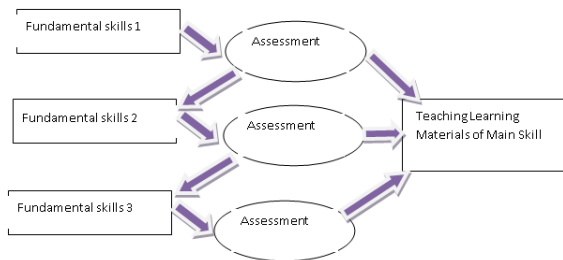


Figure 2: Fundamental Level Structure

## 2.3) Teaching and Learning Material

In this component, the teaching and learning material will be provided. The main material will be in the explanatory notes follows by examples and activities. This material will be supported by power point presentation slides, videos etc wherever applicable. The main material will be intensive where various working example will be provided. Student will be able to view more examples if they require. After a series of examples, they have to complete the respective activity. Each activity comes with a rubric. Student can compare their work with the rubric and identify their weakness. If the student error

related to fundamental skill, student will be directed to component in 2.2. If the error is relevant to the main skill, student will be directed to attempt another similar activity. Once student felt he or she had understood and able to complete the activity in the particular subsection, the student can continue to evaluate the achievement of learning outcomes of the section.

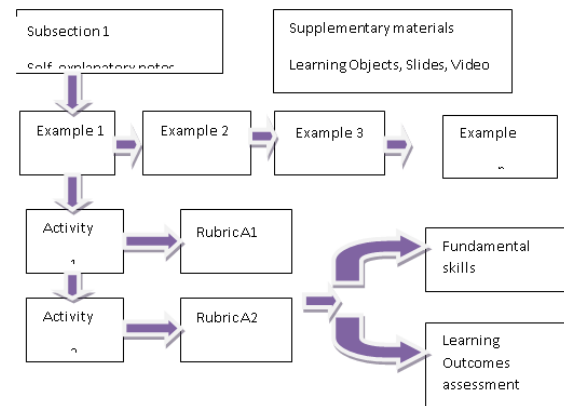


Figure 3: Structure of Main Skill Level

## 2.4) Learning Outcomes Assessment

In this component, assessment will be conducted to gauge the learning outcome of the subsection. A learning outcome is the specification of what a student should learn as the result of a period of specified and supported study. Learning outcomes are concerned with the achievements of the learner rather than the intentions of the teacher (expressed in the aims of a module or course). [2]. There will two type of student who will assess here. The first group are those achieved excellent level in the prior learning assessment. This group will be evaluated if they can achieve the learning outcomes of the section without going through the other component. The second group will be those students who went through the component 2.2 and 2.3.

If the student unable to achieve the learning outcomes of the section, they will be directed to go through the component 2.3 again. If a student is able to achieve all the learning outcomes of the section, then

he or she will be directed to continue to next section.

## 2.5) Conclusion

The proposed model will self-pace and student centred learning material. The model will optimize the prior knowledge of student in the particular skill. Student will be able to move to the next steps without repeating the known content. Student will be able to self-evaluation on most of the stages. The learning objectives of fundamental skills are being evaluated at that stage itself. At the end of the section, student will able to gauge whether they have achieve the learning objective of the section. This model also provides an opportunity to students who have relevant prior knowledge to move to next steps. This aspect is very valuable to accommodate student with better qualification than main stream students.

The model is not yet to be tested or developed as it is still in the theoretical concept and can be improved further.

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**EFL Students' Writing of English News Articles in Blogs  
(IEC2012)**

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**ABSTRACT**

Due to its ease of use and versatile capabilities, blog has become a popular tool for language learning. It allows writers to electronically publish their entries about the topics of their interests and share the information and ideas with the audience worldwide on the Internet. Therefore, the present research was intended to examine the benefits of blogs for Thai university students in the English-major when they utilized blogs to practice writing news articles in the course "English in Newspapers". Thirty-two students in the third-year worked in groups of four or five people in the class. Each group established its online news web site using free blog services from <http://edublogs.org/>. The students then assumed a new role performing like journalists at work. Each student published his or her news articles on the group's blog on a regular basis and continued blogging for a semester. At the end of the course, questionnaires were employed to survey their opinions. Descriptive statistics reported that the students generally had positive opinions about their blogging experiences. When compared with writing news on the paper, the students' news articles on blogs had a wider group of world audience. This experiential news-writing activity on blogs encouraged the students to engage in writing and publishing their news articles like the professional journalists do at work. A qualitative study of content in the students' blogs showed that the students intended to write to the audience in the real world, their news postings covered a variety of

interesting topics, and they attempted to apply the techniques of news writing. Thanks to the benefits of blogs, these English-major students had worthwhile and practical learning experiences which helped to heighten their sense of professional practices in the English course.

**Keywords**

Blog, English as a Foreign Language, e-Learning, English News Writing

**INTRODUCTION**

The curriculum of the English-Major in the Bachelor of Arts Program at the Applied Arts Department, the Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang aims at producing graduates who can apply and use their English skills in careers, research, and communication to preserve Thailand's national culture, promote ethical and moral values, and enhance human relations in the society. Therefore, a range of English courses, such as English for Business, Business Correspondence, English of Hotel and Tourism, English for the Mass Media, and English in Newspapers, have been offered to provide the English-Major students with opportunities to study English in various areas. Nevertheless, the depth and breadth of these courses are not at the same levels of those which specifically train university students for professions, such as business administrators, hotel personnel, and news reporters. Moreover, the Department of Applied Arts often lacks professional experts to train students for future careers.



Therefore, the current curriculum needs to integrate language learning activities and tasks that could, to some extent, support the students to develop specific professional skills and experiences in the English courses. Experiential language learning and practical training for professional development can help the English-Major students to familiarize themselves with professional practices that they may need for the future careers that they want to pursue.

The current research was exploratory seeking to examine the advantages of blogs as an intrinsically valuable learning tool for EFL students to practice news writing in the course “English in Newspapers”. The curriculum was intended to bridge the gap between academic studies and career preparation by creating opportunities for the English-Major students to regularly practice news writing for the audience in the real world. Blogs were used for the students to electronically publish their news articles to inform the community and public. The task mimicked the practices of the professional journalists at work as it encouraged the students to develop and apply their news writing skills. This experiential learning could foster the students’ journalistic skills development and heighten their sense of professional practices in the English curriculum. This inventive pedagogy and creative learning activities would help add pedagogical values to the curriculum and create more employment opportunities for the English-Major graduates. In essence, the current research has opened up an avenue for further studies to implement blogs, a form of online media, to invent innovative pedagogies for EFL instruction.

## **RELATED LITERATURE AND RESEARCH**

The theoretical framework employed to support the current study was based on the social constructivism and “citizen journalism”. The students performed the

role of the amateur news reporters. To practice the norms of journalism and acquire the discourse competence, they rehearsed by writing news in blogs to inform and communicate with the audience in the community who was invited to socialize in the discourse (Barrs, 1994; Bizzel, 1992; Warschauer, & Grimes, 2007). The instructor acted as a coach who provided support for the students to achieve their learning goals and discourse competence.

### **Blogging in ESL and EFL Education**

Even though in the recent years blogs have gained popularity in educational contexts as a powerful device for supporting teaching and learning, research on students’ uses of personal blogs in ESL overseas and EFL in Thai context is still very limited. Oladi (2005) implemented a blogging project in FEL instruction in Tehran and reported that the activity helped the students develop strong authorship in their writing. Bloch (2007) utilized blogging to support critical literacy and academic writing of ES students in a composition class. The study suggested that blogging could promote academic writing and help student writers to contribute information on the Internet. Dujsik and Cai (2011) integrated a blog project in low-intermediate writing classes for ESL students in the U.S.A. to publish their written works. The students in their study generally thought that blogging was useful for them to develop their writing, reading, technology, and networking skills. The researchers reported that technology tended to promote positive attitude toward learning and encourage students to write, communicate, and share ideas with their peers. In a recent work, Muangnakin and Tuntinakhongul (2012) employed blog assignment in an EFL reading course for the English-Major students at a university in Thailand. The study reported that blogs was an educational device that could foster practical and useful language learning for the students; in addition, blog assignment

could help the teacher to create a supportive learning environment. Generally, the students considered the blogging assignment beneficial for practicing writing in English and sharing their comments related to the readings. Blogging also promoted the students' ownership of their blogs. Nevertheless, literature and research on using blogs as a venture for training journalism skills for EFL students in Thai context is nonexistent. Thus, the current research was initial and exploratory.

### **Blogs and Online Journalism**

The Internet has become an important channel for local and global communications. Thanks to the new publishing technology, weblogs or blogs have emerged as a new mode of citizen communication. Weblogs or blogs is a form of online writing which can integrate hyperlinks. The inexpensive and free software enables users to build and update pages with minimum technical knowledge. Users utilize the available templates to easily log on to their blogs and add texts, hyperlinks, images, audio files, etc. The pages are chronologically organized in an inverse order, down from the most update entries. As blogs can encourage interaction among a variety of readers and writers, they can proliferate to establish a "blogosphere," a social network consisting of bloggers and readers; bloggers publish and interconnect their posts to related online sources and readers contribute their comments on blogs (Rich, 2010; Stauffer, 2002).

Since blogs have become popular, it has been predicted that the future audiences for news, including public relation information, tend to be part of the blogging generation (Rich, 2010). Blogs have already become a popular and prominent emerging form of online journalism developed in the context of the World Wide Web (Matheson, 2004). Nowadays, blogs appear to be everywhere in and related to journalism as they offer

opportunities for journalists to disseminate news and information. News organizations rely on blogs as complementary sources to provide information, individual journalists maintain personal blogs, and a number of individuals in the public have taken up blogs similar to news journalism (Domingo, & Heinonen, 2008). Media organizations have explored the potential of blogs as a journalistic genre. Features, such as "comments" beneath blogs, increase interactivity and they encourage readers to visit the web sites regularly (Domingo, & Heinonen, 2008). They provide insight into what readers are concerned about related to news events. In addition, a lot of professional journalists keep their news-related blogs, in which they claim for immediacy, instant critics, authenticity, and depths and thoroughness of reports (Matheson, 2004). These values enhance the essential qualities of journalism.

A number of blogs often started with personal journals for friends and people who share similar interests; however, they can become valuable sources for journalists as eyewitnesses of important events such as tragedies and natural disasters. The phenomena when readers and viewers of mainstream media get involved in reporting and disseminating news are called "citizen journalism," "participatory journalism," "public journalism," or "civic journalism". "Citizen blogs" refer to journalistic blogs written by the public outside the media. They have been regarded as the efforts of the citizens who care about their community and the news coverage in the mainstream media in the society (Rich, 2010). It is also believed that every citizen is a reporter who can report important issues all over the world. The news contributors are often called "citizen journalists" or "citizen reporters". In some important way, citizen blogs may perform social functions, norms, and values about their practices similar to those of institutionalized media when they have a

clear purpose to gather information, analyze, and interpret or comment on current events and problems to broad audiences (Domingo, & Heinonen, 2008; Lowrey, 2006). Bloggers sometimes scrutinize and criticize institutional journalism for lacking variety and diversity of coverage, and depth of coverage (Regan, 2003; Mitchell, 2003; Reynolds, 2003 see in Lowrey, 2006).

The potential role of blogs, as a new media venture to provide the opportunities for the English-Major students to practice news writing and develop journalistic skills, was focused in this research. "Citizen blogs" could encourage EFL students to practice news writing and promote their publishing of public-interest information. The students were encouraged to adopt the traditional values of journalism to contribute to reliable news and information source for the public; these include perceived honesty, accuracy, fairness, objectivity, and transparency of information (Domingo, & Heinonen, 2008; International Federation of Journalists, 1986; Society of Professional Journalism, 1996 see in Lowrey, 2006). To increase the reliability of their posts and ensure accountability, student bloggers can use hyperlinks to websites and online sources referred to in the text (Domingo, & Heinonen, 2008). Ultimately, it was hoped that the skills and experiences that the students developed in the course could promote meaningful literacy practices in English, as well as participation in open, intelligent, and productive public discussions.

## **RESEARCH METHODOLOGY**

### **Participants**

The participants were 32 third-year students enrolled in the course "English in Newspapers" in the English-Major of the Applied Arts Program, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand in the academic year 2011. There were 5 male students and 27

female students. The students' English proficiency level was identified as intermediate. These students did not have previous experience in blogging in English before participating in this course.

### **The Course and Data Collection**

One of the researchers taught the course "English in Newspapers" and provided feedback on the students' blogs. The class met once a week for three hours and this one-semester course lasted for 14 weeks. The instructional framework and content were based on the textbook *Writing and Reported News: A Coaching Method* written by Carole Rich (2010). The lessons focused on the qualities of news, elements of news stories, story ideas, sources, and news gathering. The class also read a variety of news articles from *the Bangkok Post*, such as national, political, social and international news. These also included business, education, crime, editorial, and interview articles and features.

According to the curriculum, the students were required to practice writing news articles. Thus, they learnt to write news headlines, leads, and details to support news stories, including how to use photos and graphics to support news articles. They were assigned to work in a small group of 3 to 4 people to establish their group's news blog. The group subscribed for a free blog service at <http://www.edublogs.org>. The group members took their role of amateur journalists; they searched interesting and newsworthy stories, gathered news, ensured accuracy, wrote news entries, and posted them in their group's blog regularly. Their news blogs focused on providing useful news and information for the community and general public. Each member was required to write 10 news articles and help manage the group's news blog by taking turn editing the posts of other members. The instructor provided comments on their posts for grammar correction and content editing. The class was encouraged to read and respond to the

classmates' news blogs located at <https://patchareemuangnakin.wordpress.com/2012/01/27/english-in-newspapers/>. At the end of the course the students were asked to complete the questionnaire to provide information about their news blogging experiences.

### Research Instrument

The questionnaire was used to survey the students' opinions on their experiences of blogging news for this course. It consisted of three main parts: 1) students' personal information, 2) students' opinions on their news blogging experiences, and 3) open-ended questions. Part 2 consisted 21 items and the respondents rated their opinions on a four-point Likert-scale. The score of 1 was assigned to Strongly Disagree, 2 to Disagree, 3 to Agree, and 4 to Strongly Agree. Part 3 contained three open-ended questions asking the students to describe the benefits of news blogging and related problems and to provide suggestions for improving news blogging assignment.

### Data Analysis

The data from the questionnaire were analyzed using SPSS statistical package. The findings were reported in terms of descriptive statistics: means and standard deviations. Then, students' responses to the open-ended questions in the questionnaires concerning the benefits of news blogging, problems and suggestions for news blogging assignment were investigated thoroughly in order to identify the categories of data. The data were coded and relevant qualitative findings were reported. After that, the topics of the students' news blogs were categorized.

## RESULTS AND DISCUSSION

Although blogging is not a brand new technology, it was quite a new experience for the EFL Thai students in the current study to use it. However, both quantitative and qualitative findings show that the majority of students experienced the usefulness of practicing news writing in

blogs. The majority of the students found that it was useful to use blogs as a medium to learn and practice English. Especially, they could apply knowledge from the course to write and publish their news articles on the Internet. Nevertheless, some concerns related to technical problems and language difficulties were raised, and useful ideas were proposed to improve blog assignment based on the problems the students encountered.

### Quantitative Findings

The findings in Table 1 indicate that the majority of the students who answered the questionnaire were female (26 out of 31), and the average age was 21.

Table 1 : General information of the participants (n = 31)

| Details      |        | Number    | Percentage   |
|--------------|--------|-----------|--------------|
| 1. Gender    | Male   | 5         | 16.1         |
|              | Female | 26        | 83.9         |
| 2. Age       | 20     | 7         | 22.6         |
|              | 21     | 20        | 64.5         |
|              | 22     | 3         | 9.7          |
|              | 23     | 1         | 3.2          |
| <b>Total</b> |        | <b>31</b> | <b>100.0</b> |

Table 2 represents the students' opinions on their news blogging experiences. It shows that the majority of the students tended to agree that writing news in blogs was useful for them to learn English (2.90). News blogging made the students pay more attention to the situations, news and social problems around them (3.23), engage in current news and situations around them more often than earlier (3.13), and broaden their viewpoints on the current news issues (3.10). Also, when writing news they needed to apply critical thinking skills (3.19) as well as vocabulary learnt from the class much more than before (3.19). Moreover, the students were proud to present their works on the Internet (3.00) and they had the impression that they were working like journalists who write and report news (3.00). The students also agreed that their news

blogging experience can be useful for future careers as they could apply

knowledge, skills and experience to work (3.00).

Table 2 : Students' opinions on their news blogging experience (n = 31)

| Item sequence in the questionnaire | Students' opinions on news blogging experience  | Mean          | S.D.          | Rank  |
|------------------------------------|---|---------------|---------------|-------|
| 13.                                | Practicing news writing draws my attention to news, current situations, social activities and social problems around me.  | 3.23          | .497          | 1     |
| 4.                                 | I have used the vocabulary in the news context which I have learned in the class to compose news in my blog.  | 3.19          | .654          | 2(2)  |
| 14.                                | Practicing news writing allows me to apply critical skills more than before.  | 3.19          | .543          | 2 (2) |
| 15.                                | Practicing news writing makes me feel more interested in current situations and news around me.   | 3.13          | .428          | 3     |
| 16.                                | Practicing news writing has broadened my points of view on current news and activities in the society.  | 3.10          | .301          | 4     |
| 10.                                | I am proud of presenting useful news or information in my news blog.  | 3.00          | .516          | 5(3)  |
| 12.                                | Practicing news writing in blogs for this class made me feel that I was practicing and working as a real news reporter.   | 3.00          | .775          | 5(3)  |
| 18.                                | Practicing news writing in my blog gives me knowledge, skills and experience that I can apply for my work in the future.  | 3.00          | .516          | 5(3)  |
| 3.                                 | I have applied techniques of news writing learned in the class to compose news in my blog.  | 2.97          | .482          | 6(2)  |
| 9.                                 | My blog always reports up-to-date and important news which I think they are very useful for my audience.  | 2.97          | .547          | 6(2)  |
| 8.                                 | I am happy to know my news blog has received comments from the audience.  | 2.90          | .790          | 7(3)  |
| 11.                                | I think in the future, blogging should be used as a medium to encourage EFL students to practice writing news.  | 2.90          | .597          | 7(3)  |
| 20.                                | Practicing news writing in blog encourages me to bring all knowledge, skills and experience from class to help or volunteer to work either in the public relations office of my university or government agencies or private organizations. | 2.90          | .597          | 7(3)  |
| 2.                                 | Writing English news in my blog helps improve my news writing skill.  | 2.87          | .670          | 8(2)  |
| 7.                                 | I am happy to know my news in the blog has been read.   | 2.87          | .619          | 8(2)  |
| 17.                                | Practicing writing news has made me gain more confidence in composing English news.   | 2.74          | .682          | 9     |
| 5.                                 | Using blog motivates me to write English news more than before.   | 2.48          | .724          | 10(2) |
| 21.                                | After completing my study in this course, I have more attention in the career of news writer.   | 2.48          | .769          | 10(2) |
| 1.                                 | I love writing English news more than before.   | 2.45          | .568          | 11    |
| 19.                                | I will use blog to continue writing news and other interesting information after completing this course.  | 2.42          | .720          | 12    |
| 6.                                 | My news blog interested the audience so that they kept reading the news in my blog.   | 2.19          | .654          | 13    |
|                                    |   | <b>2.9032</b> | <b>.45484</b> |       |

The results of the present research support the findings and claims of the previous studies which advocate blogs for education and communication, such as the studies of Oladi (2005), Bloch (2007), Dujsik and Cai (2011), and Muangnakin and Tuntinakhongul (2012). Nonetheless, the students appeared to think that their news blogs could attract a very

limited number of audiences. The present study, thus, suggests that students' news blogs should be promoted more actively on the campus and in the community in order to connect the authors with the audiences. Generally, the students in this study seemed to be more satisfied with the benefits of news blogging for practicing and improving their English skills, such as

practicing writing regularly, applying knowledge of news writing, and using new vocabulary than with an opportunity for career development in journalism. It could be explained that generally the students enrolled in the Applied Arts program have not yet determined to pursue a specific career path until it is near the time they will graduate or after that, so this course which allowed them to survey the experience of news writing merely for a semester could not make a tremendous impact on their career choice. Moreover, as news writing is a challenging and difficult task, the students' perception about their own limited English writing proficiency may have affected their opinions on news blogging in some way. Therefore, future research may need to investigate this relationship.

However, the current study has advanced a step in reporting the effects of applying blogs, an electronic device on the Internet, for educational goals. The study attempted to make the best use of the electronic tool to accomplish the pedagogical goals of EFL instruction. The innovative pedagogy proposed in the study provided the students with the opportunities to practice a new form of literacy and authorship in their EFL class allowing the students to develop the important electronic literacy skills.

### **Qualitative Findings**

Qualitative findings can confirm the quantitative results that blogs offer a lot of benefits for learning English as a foreign language, especially practicing news writing. The students covered various news topics in their news blogs. Nonetheless, some problems were raised and the suggestions related to the selection of blog provider, the organization of time, and the types of support needed should be taken into account for further improvement.

#### ***The topics of news coverage***

The popular news topics posted in blogs were about the events on the campus such as curricular activities, exhibitions,

academic seminars, students' voluntary activities in the community, students' awards, plays, singing contest, sports days, the hazing ceremony, a farewell party for senior students, the institute's affairs, faculty members' research, etc. Other intriguing news postings were about interviews with interesting people, local businesses, local people, social events, celebrities, entertainment, politics, education, and the environment. These findings show that news blogging encouraged the students to generate their interest in many things around them.

#### ***The benefits of news blogging***

From the responses to the open-ended questions in the questionnaire, the qualitative findings could confirm the benefits gained from news blogging reported earlier in the quantitative findings. Three types of the advantages of news blogging were found; news blogging supported language learning, enhanced social and cognitive skills, and fostered technology skills. Firstly, the opportunities to practice writing in English could be prioritized as the most important benefit. 8 students agreed that they had more opportunities to practice English. 7 students focused on improving their news writing skills while 5 students said that it helped improve their writing skills in general. 4 students believed that they were more cautious about language use. The other benefits included learning new words. Secondly, social skills and critical thinking skills could be enhanced by blogging experiences. 7 students felt they were more engaged in and cared more about current situations, including news and social activities around them. 3 students thought news blogging encouraged them to think critically. 3 students thought that blog was a space to let others share ideas with them and it was a medium to help them connect to the world. The other benefits included gaining more confidence and patience. Thirdly, blogging allowed the students to build communication skills using

electronic technology on the World Wide Web. 4 students said that they could learn how to use blog more effectively. 2 students agreed that blogging helped them to develop computer and technology skills. 2 students said that blogging made news more interesting and easily accessible.

### ***The problems of news blogging***

The students reported 2 main types of problems. The first group was related to technology and the latter concerned language difficulties. In terms of technology, more than half of the participants blamed the defects as a result of technical problems such as spam, system break-down, slow connection, and uncontrolled conditions of the blog provider. Concerning the problems related to language use, 8 students thought their grammar was poor. 4 students said they had insufficient vocabulary. 3 students could not use the correct sentence structures. 2 students said they could not organize ideas well.

Other miscellaneous problems came from various factors. 2 students said they had no idea about what to write and they could not find something interesting to write about. The problem concerning time constraints was also raised as some students felt they had loads of homework and assignments to deal with in other subjects. They thought writing news in blog took time longer than they expected. So, they could not manage their time for doing other things effectively. The students said they needed more guidance and correction to help them gain more confidence in using English to express their ideas and write news articles more effectively.

### ***Suggestions for improving news blogging assignment***

There were 2 main aspects of suggestions from the students related with the problems mentioned above: blog technology and language difficulties. 6 students were not satisfied with the blog technology; they need the blog which is

well-designed, has fewer problems, and allows the user to create more categories of news. In terms of language barriers, 5 students suggested that news writing should be done more regularly. 2 students preferred practicing writing on the paper for the instructor to correct mistakes before they post on the Internet. 2 students said that reading more news articles from newspapers would help them to write more effectively. The students also expressed their needs for more guidance and advice from the instructor to help them use correct grammar and sentence structures. In addition, some students said that they needed more time to finish each news entry.

### **Implications for EFL Instruction**

For instructional implications in EFL courses, the findings from the current study should be cautiously applied because students' news blogging should also essentially focus on careful and unbiased news reporting. In addition, other codes of journalism practices related to accuracy, privacy, discrimination, confidential sources, witnesses, children, and victims of crime should be rigorously observed and strictly adopted when students practice reporting news.

Nevertheless, when blog assignment is carefully designed and supervised, the technology can provide a lot of benefits for learning. After the ASEAN community has been launched, Thailand will need to cooperate with its neighboring countries more than it did in the past, and we will see the flow of workforces from the member countries in the country. Inevitably, Thai people will be pressed by the needs for international transactions and communications at home and overseas. Therefore, Thai citizens have to embrace such changes and prepare themselves for international cooperation and competitions. As EFL educators, we need to assist Thai students to improve their English skills and encourage them to use English in daily life.

To promote life-long learning and sustainable literacy practices in English, students should be urged to use English to communicate and share information about their local communities and affairs with foreigners who reside in the Kingdom and with other Thai people. Therefore, academic institutes need to boost students' enthusiasm for serving the community. Blogging in English can help promote important local activities which are important for the residents. In essence, instead of being merely information consumers, students should be encouraged to create and disseminate information by authoring multimedia documents in order to help construct a knowledge-based society. Then, the audience members in the community should be invited to participate by reading and sharing opinions in such public discourses.

Besides disseminating news and information, blogs can be effectively employed as a tool to promote local culture, businesses, tourism, and many other essential entities of a local community. It is hoped that students who participate in blogging projects will be able to utilize their electronic literacy skills and the experiences to initiate or participate in civic activities to serve their communities.

## CONCLUSION

This present study examined the opinions of the English-Major students on their news blogging experiences and it reported the potential benefits of blogs for EFL education. Generally, the students agreed that blogging provided them with useful and practical learning experiences, enhanced their social and cognitive skills, and fostered their technology skills. However, some problems related to the blog technology and language barriers were also addressed, and they need to be taken into account when implementing a blogging assignment.

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## Mind Map Based Semantic Web Browser for Tablets

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### ABSTRACT

**Semantic Web embeds “meaning” to data in order for users to retrieve information more effectively. The number of webs that have semantic tags is increasingly available in many domains. However, tools for using Semantic Web nowadays are still difficult to use and require understanding of semantic tags. This research aims to provide a tool to help students and children to have access to Semantic Web. As tablets start to become a standard platform for students and children to access the internet, Semantic Web browser on tablets is a logical development. To simplify a query, users compose the query using Mind Map metaphor. An interface based on touch can be implemented to compose a query diagram. This interface makes learning more fun and retrieving information more easily. It also encourages students to explore knowledge by themselves. Instructors can also present information more interestingly in form of relationships between topics.**

### Keywords

Linked Data, Mind Map, Semantic Web, tablet

### 1) INTRODUCTION

The Semantic Web is a new technology where there are mechanisms to link various components and combined them into a system. It is difficult to design a program to connect typical users especially children to the Semantic Web. Users require

understanding Semantic Web as a basis to use it effectively.

To make it easier to use the Semantic Web, the design of the user interface should be in the form of the diagram which reflects the structure of a Semantic Web. We consider many diagrams that typical people and children can understand it without technical knowledge or even little knowledge about computers. We believe that Mind Map is appropriate for this case due to ease of understanding. The format of Mind Map fits to the structure of meaning of Semantic Web. That is the main idea of this research.

### 2) BRIEF INTRODUCTION TO THE MIND MAP

Mind Map is a diagram that represents the connection of concepts, ideas, topics or thoughts. The Mind Map has been used in large scale, especially in academic. Mind Map starts with the main idea at the center of the diagram and the related ideas branch out like a tree. Each branch is further divided into several other related ideas. The important highlight of the Mind Map is that each branch can continue as long as there are new ideas related to the subdivision. Figure 1 shows an example of the Mind Map.

### 3) BRIEF INTRODUCTION TO THE SEMANTIC WEB

Semantic Web is a new technology based on current Web technologies and the Internet. Essentially, the Semantic Web is a set of protocols at different levels that work together to enable us to store the data

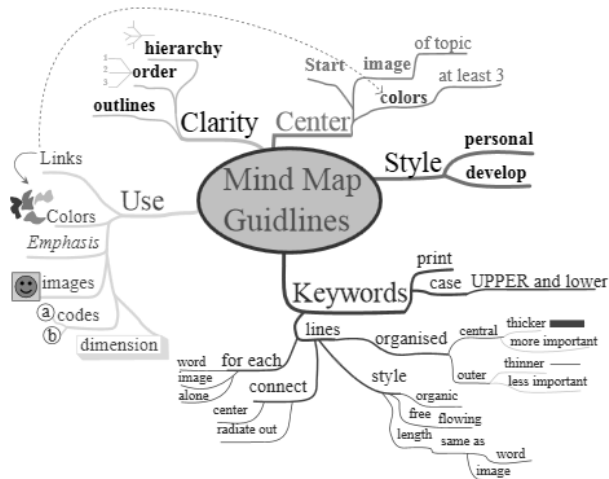


Figure 1: An example of the Mind Map<sup>1</sup>

structures on the Web in the form of the relationship. The relationship can connect between many systems via the Internet to form a virtual large distributed database. Simply speaking, if the World Wide Web is the web of traditional documents linked by hyperlinks, the Semantic Web is the web of data linked by semantic relationships which we call this as Linked Data.

This is some example to show advantages of Linked Data over the current Web. To finding information about proteins that affect the treatment of Alzheimer's disease. It has been studied around the world today. If you search using the regular search engine results might be greater than 200,000 documents from web sites around the world and we are unable to distinguish or discover them at all. However, in the Linked Data, the result may be a list of just merely 20 of proteins that affect the disease from the Semantic Web of the current researchers that share information.<sup>2</sup> Figure 2 illustrates the layers of related technologies integrated together as the Semantic Web.

#### 4) RETRIEVING THE DATA FROM THE SEMANTIC WEB IN THE FORM OF MIND MAP

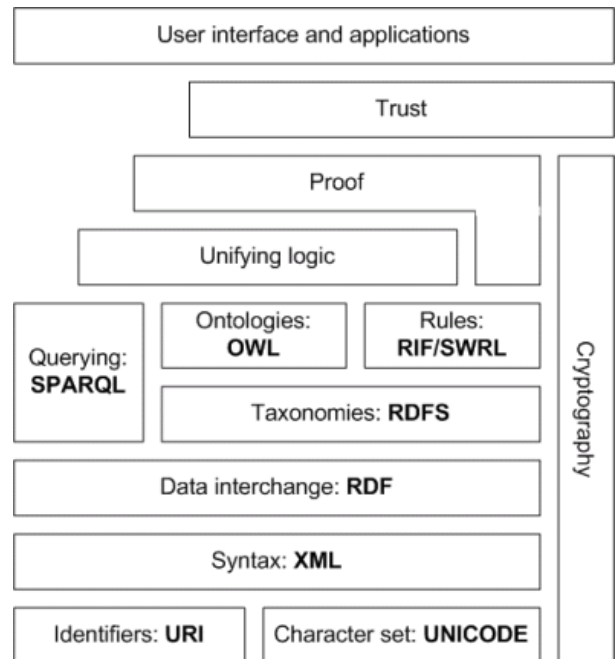


Figure 2: Layers of technologies that work together as the Semantic Web<sup>3</sup>

To search data from the Linked Data using Mind Map metaphor, starting from creating a main concept with a keyword you want to search. For example, to search for information from Linked Data about the term 'Chula' will be shown in Figure 3.



Figure 3: Start creating main idea from keyword to find

The first node is the node 'Chula' then the program will find information from Linked Data about this main concept as shown in Figure 4.



Figure 4: Another related ideas found from the Semantic Web

<sup>1</sup> [http://en.wikipedia.org/wiki/mind\\_map](http://en.wikipedia.org/wiki/mind_map)

<sup>2</sup> [http://www.ted.com/talks/tim\\_berners\\_lee\\_on\\_the\\_next\\_web.html](http://www.ted.com/talks/tim_berners_lee_on_the_next_web.html)

<sup>3</sup> [http://en.wikipedia.org/wiki/semantic\\_web](http://en.wikipedia.org/wiki/semantic_web)

When you double-click or double-tap on any of the sub topic, the program will search and display information in Linked Data associated with that sub topic. Figure 5 and Figure 6 shown when tap on the ‘Chulalongkorn’ and ‘Chulalongkorn University’, respectively.

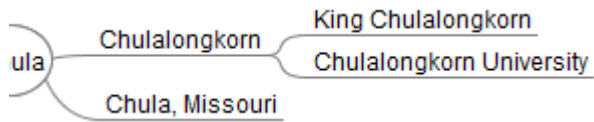


Figure 5: Expanding a sub topic

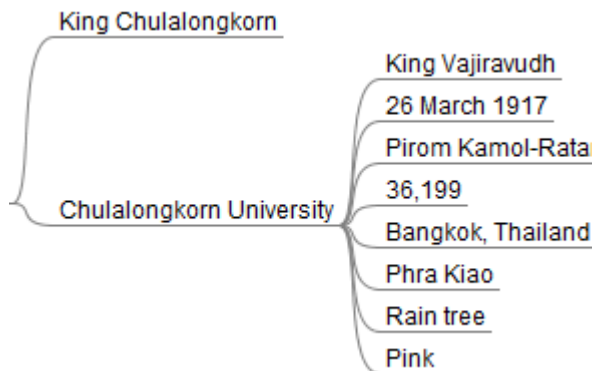


Figure 6: Expand another more sub topic

If you want to know the relation of the sub topic to the prior topic or want to know the type of data the sub topic, move the pointer over or directly tap the sub topic then program will show the relationship between the topic or the kind of such information. For example, in Figure 7, when tap on ‘26 March 1917’ it shows that is the establishment of the university. In Figure 8, when tap at ‘36,199’ it shows that is the total number of all students in the university.

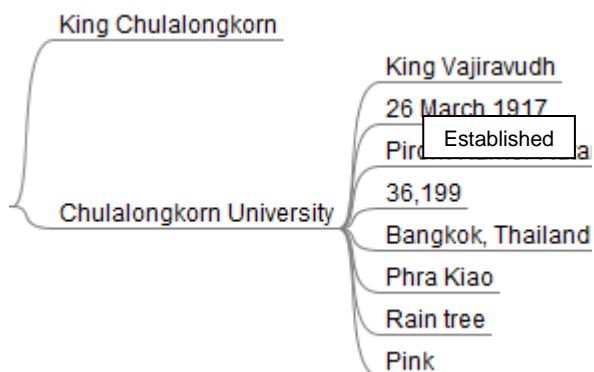


Figure 7: The relationship of a sub topic

To expand the sub topic, there may be some cases where the expanded topic has been previously displayed on the Mind Map. The program will display an arrow link and links back to the first topic

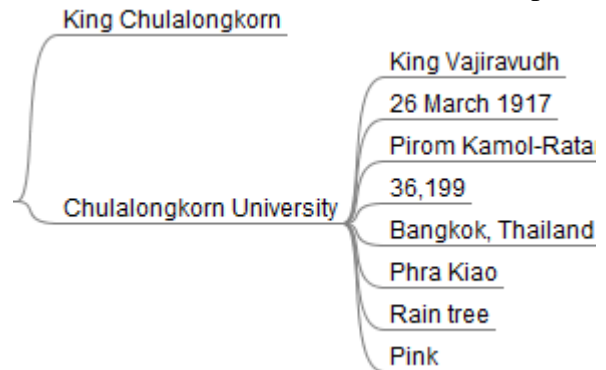


Figure 8: The kind of a sub topic data

appeared to reflect the relationship of the relevant information and avoid duplication and redundancy in the case that has caused the loop. For example, in Figure 9, the topic ‘King Vajiravudh’ is found to have a sub topic called ‘King Chulalongkorn’ which appears previously.

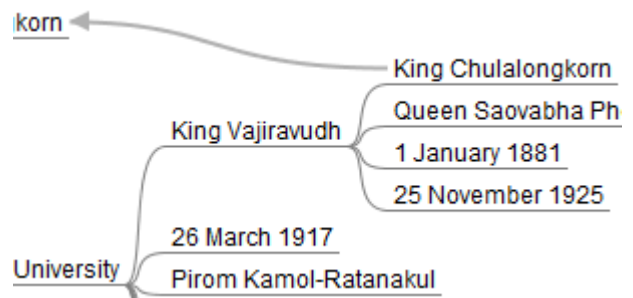


Figure 9: Link between the topics that are previously displayed

## 5) EXAMPLE OF SEMANTIC WEB QUERY

Finding information from Linked Data to display on the Mind Map required multiple components of the Semantic Web. However, one of the most important parts is to create queries in SPARQL. We will not describe the details of SPARQL here but rather simply shows an example query<sup>4</sup> to achieve results from ‘Chulalongkorn University’ sub topic expansion in Figure 6.

<sup>4</sup> <http://dbpedia.org/snorql/>

```
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd:
<http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-
schema#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-
syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX dc: <http://purl.org/dc/elements/1.1/>
PREFIX : <http://dbpedia.org/resource/>
PREFIX dbpedia2: <http://dbpedia.org/property/>
PREFIX dbpedia: <http://dbpedia.org/>
PREFIX skos:
<http://www.w3.org/2004/02/skos/core#>
```

```
SELECT ?property ?hasValue
WHERE {
```

```
<http://dbpedia.org/resource/Chulalongkorn_Univer-
sity>
  ?property ?hasValue
}
```

## 6) CONCLUSION

To facilitate naïve users to use Semantic Web, the query based on drawing Mind Map diagram is proposed. The relationships in Mind Map are naturally fit to the relationships in the Semantic Web. Hence, forming a query is easy and it has additional advantage that users do not require technical knowledge about database and need very little computing skill. This tool can increase the access to the knowledge on the web for ordinary people and young children.

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## **An Ecological Approach to Using Ubiquitous Handheld Devices in the Classroom**

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### **ABSTRACT**

**Technology has radically changed the teaching paradigm offering learning that is effective and attractive to students. Ubiquitous handheld devices enhance knowledge acquisition through contextualized and social learning that is relevant to students' needs. Mobile technology provides learners with additional educational experiences hence increasing their learning spaces by taking learning out of the classroom. The aim of this paper is to analyze the use of technology in learning a foreign language from the ecological viewpoint. The use of handheld devices in education is discussed as playing a part in educational context in the interaction of the learner, the world's languages and communicative technologies.**

### **Keywords**

ecology, Foreign Language Learning, mobile learning, ubiquitous handheld devices

### **1) INTRODUCTION**

Technology, especially mobile technology, is ubiquitous; wireless networks expand and mobile devices connected to the Internet increase in popularity. Most students own and use handheld technological devices on a daily basis. Increasingly widespread use of technology in the modern world affects every sphere of life, including education. Educators should seize the opportunity arising from students' interest in these technological devices and their extensive use for instructional purposes hence increasing

their learning spaces by taking learning out of the classroom. It helps to build up learner autonomy and makes learning more personalized. Furthermore, it helps the school to keep up with the changing world.

### **2) ECOLOGICAL APPROACH TO LEARNING**

Technology-supported education proves to be highly successful in supporting learning and teaching (Kukulka-Hulme & Shield, 2008; Traxler, 2005). An ecological approach to learning perceives education as a collaborative process embedded within an environment; learning takes place in the interaction between the learner and the environment (van Lier, 2004: 4-5). Ecological approach emphasizes diversity, active participation of every individual working towards the intended goal and the environment seen as exerting an influence on the course and consequence of human development (Bronfenbrenner, 1988: 68; Brown, 2000: 12). It introduces dynamics into the classroom, interaction, and complexity of relationships, which is in line with Vygotsky's learning theory. The psychologist sees learning as a complex and dynamic social experience. Bronfenbrenner (1988) also emphasizes that development cannot be separated from the complex system of relationships within the environment, which can be presented in the form of an order of systems: the microsystem, which refers to "the structures and processes taking place in an immediate setting (...) (e.g. home, classroom, playground)" (Bronfenbrenner, 1988: 80); the mecosystem, that is the links between different settings (e.g. the link between family and school); the exosystem,

which involves the links between different settings when one of the settings affects the individual indirectly (e.g. parents' work and the child's schoolwork); the macrosystem, that is "an overarching pattern of ideology and organization of the social institutions common to a particular culture or subculture" (Bronfenbrenner, 1988: 81).

The applications of Bronfenbrenner's theories in education are numerous comprising general education of the learner, which needs to be instilled in close cooperation with the child's caregivers taking into consideration social, cultural, political, and linguistic context. First, students live in a larger political and historical context (the macrosystem), which affects their learning for example by motivating or demotivating them to learn the language of a country with which their native country maintains friendly or hostile relations. Next, complex relationships within the mecosystem and the exosystem (in particular the family, peers, school as well as the mass media) directly affect students' learning process.

### **2.1) Family**

The family plays a significant role in children's academic achievement; students who do better at school are the ones who come from a stable family exhibiting consistent raising style, allowing joint-decision making and monitoring children's behaviour rather than a single-parent one in which children are allowed to take decisions early. Communication style appears to be another factor important for educational success; teenagers used to a free style communication at home become better students and have more positive attitudes towards learning as they are more likely to interact successfully with teachers and peers, whereas pupils brought up in families where conformity was required tend to receive lower grades (Dornbusch, 1989: 239-248). Familial socialization is so influential as to precondition the child's

educational achievements and occupational career (Hurrelmann, 1988: 75; Sugarman, 1967: 158-160).

### **2.2) Peers**

Apart from the family, peer groups form another part of network with complex and multidimensional character affecting the learner. Past research (Coleman, 1961 as cited in Dornbusch, 1989: 236, Parsons, 1942 as cited in Sugarman, 1967: 152) showed that the peer group remains in opposition to parents with peers and parents struggling for control over teenagers. However, Bandura (1964 as cited in Dornbusch, 1989: 249; Coleman 1961 as cited in Sugarman, 1967: 152) maintains that peers reinforce rather than oppose the values exhibited by parents. Thus, parental and peer influence does not stand in opposition; actually parents influence the choice of peers first, by providing the relational model (i.e. children learn from the parents formation and maintenance of social relations as well as social skills) and by affecting other social factors, such as social class and educational level (Meeus, Oosterwegel & Vollebereg, 2002: 95). It needs to be pointed out that peer influence extends within the field limited by the factors that are closely connected with the function of the group; thus, in certain matters, such as physical appearance, peers' acceptance is essential while in others, such as the choice of career and further education, it is less significant. Another research, carried out by Clay V. Brittain (1963) (also in Kandel and Lesser, 1970: 284; Meeus, Oosterwegel & Vollebereg, 2002) has shown that adolescents are likely to follow their parents' expectations in future oriented situations as well as roles and their peers' expectations in current oriented situations and identity needs. On the other hand, Brown, Classen & Eicher (1986) found that the influence of peers decreases as teenagers mature and become dissatisfied with conformity.

### **2.3) School**

Alongside the family and peers school is a social institution that affects the learner to a great extent. By and large, it is contended that school (especially post-primary school) is focused on developing cognitive skills rather than social ones; however, teachers ought to remember that both cognition and socialization are the main goals of school education as well as fostering the ability to learn or forming the necessary social and psychological attitudes (Hurrelmann, 1988: 69). The development of social and affective dimensions is possible due to student-teacher interaction and technology-supported education can create an abundance of opportunities for learners to acquire skills of social interaction, cooperation and proper interpersonal relations in a group, turn-taking, face-saving or civility.

### **2.4) Mass media**

Finally, the mass media affect learning and development of students. The majority of teenagers watch television for at least 2 hours a day. Assuming that at least 15 commercials are broadcast every hour, a young person may watch over eleven thousand advertisements a year the majority of which carry consumerist values and gender stereotypes. During their lifetime adolescents have seen 13,000 violent deaths on television (Gerbner and Gross, 1980 as cited in Witt, 2000); Aronson (2004) claims that an average teenager has seen 100,000 acts of violence (both physical and verbal). The mass media affect education of young people in several dimensions. First, the mass media not only provide information, viewpoints on current and past affairs, entertainment, and education but also judge and decide on the attractiveness of various domains of culture (music, film, literature, ideology, religion, sport). Second, the mass media create, reinforce, alter or destroy values and norms of behaviour, stereotypes, gender roles as well as authorities.

Furthermore, mass media publicize knowledge and various domains of culture; thus, introduce and reinforce the youth's intellectual diversity, promote the model of a good man, help to preserve cultural heritage, introduce cultural novelties, and promote prosocial behaviour. The influential role of the mass media may be used to the advantage of the learning process that takes place at school. First, television offers numerous educational programmes that are more attractive for children and adolescents than school. Spending an abundant amount of time in front of a television set, young people are used to being flooded with an unlimited number of images, sounds and pieces of information. Thus, the use of educational and information programmes as well as films allows to escape the routine of the lesson. An interesting source of authentic and descriptive language are commercials, which include a short message placed in a setting familiar for learners. A rapidly developing branch of Foreign Language Teaching is Computer Assisted Language Learning (CALL) that, through the use of the World Wide Web or e-mail, provides students with real-life social context and interpersonal interaction (other than teacher-student or student-student) that will enhance learning, develop communicative and intercultural competences, and increase motivation. Furthermore, the Internet provides a rich source of online materials for individual use, which increases learners' autonomy and provides an abundance of opportunities for learning.

By and large, the ecological approach to learning provides a conceptual framework for education where learning is based on interaction between the learner, the teacher, other students, instructional content and technology thus enriching the resources for the learners and increasing their learning spaces. But it is upon the teacher to determine the extent to which technology is introduced to ensure meaningful learning that fits the needs of the learners and their



changing learning habits. The ecological theory emphasizes that successful learning is collaborative, responds to the needs of learners and takes place through well-adjusted and harmonious relationship with the environment. All elements of this relationship are dynamic and interdependent. Technology can be one of the factors that form a bridge between the school setting and their personal life. Large-scale social, cultural, political and technological changes affect learners, modify the way they learn and thus should be reflected in the changes in education.

### **3) TECHNOLOGY IN THE CLASSROOM**

Handheld devices can be easily integrated with classroom activities; thus, they become convenient pedagogical tools that are very popular with all learners. They are both content-based and social devices. First, mobile technologies deliver content in the form of written text, graphics, audio e.g. mobile phones, MP3 players, handheld computers, and gaming devices. At the same time, these devices can be used as social tools that promote interaction with other people (the teacher or students) through communicative activities and team work. Handheld computers facilitate collaboration through Web 2.0 tools (students actively participate in creating blogs, wikis, tags or instant messaging) while other mobile devices can become tools for doing team projects, which promotes autonomous learning. Students can do the project at their own pace. When they are invited to present the results of their study or research to other students, learners actively participate in the construction of the class content, contrary to the traditional classroom where it is the teacher who provides learning material (Kukulaska-Hulme & Shield, 2008). Mobile technology transforms classroom instruction so that it supports learning styles that promote “fluency in multiple media, learning based on collectively

seeking, sieving and synthesizing experiences rather than individually locating and absorbing information from a single best source, and active learning based on real and simulated experience that includes frequent opportunities for reflection” Dieterle et al (2006 as cited in An, 2008: 207)

### **4) USING UBIQUITOUS HANDHELD DEVICES IN THE CLASSROOM**

Various ubiquitous handheld devices can be used in the classroom to supplement learning activities. Teachers may integrate technology into the curriculum in order to facilitate students’ learning process as well as to help with classroom administration, e.g. mobile devices can be used to distribute announcements or for grading. Students, on the other hand, can use technological devices to collect data and explore topics, learn and review vocabulary, or reflect on the activity. These devices can be used both for individual and team work when learning becomes a social process, which further enhances the learning process. Handheld devices then offer collaborative learning activities that rely on the student’s interaction with their peers as opposed to online forums or chats that substitute face-to-face discussions (Kadirire, 2009). Furthermore, technology-supported education facilitates learning as it addresses multiple learning styles and intelligences. Visual students can use mobile devices to present information in graphic form accompanied by charts, video, animations and other visual materials. Auditory learners may listen to podcasts or video in order to get information. Kinesthetic students enjoy developing their motor skills. Finally, analytic students can use mobile devices to collect the chunks of information from which they will build up their knowledge while holistic students might look for an overview first and then break it into smaller chunks; they can use

drawing and manipulating to assist in the learning process.

Introducing technology into the classroom may involve several challenges that teachers need to take into account. First, some handheld devices are expensive but when students work in a group, they can share one device per group. Moreover, due to the small size of portable devices, classroom management is more difficult: teachers should monitor students in order to make sure all students work on the assigned task.

## 5) CONCLUSION

Technology has radically changed the teaching paradigm; the integration of mobile technologies into education makes learning effective and attractive to students. The present article examines technology-supported education from the ecological perspective. At the beginning of this paper we discussed the effect of students' environment on their learning processes. We then explored the benefits of introducing technology, in particular mobile technology into the classroom. Using mobile devices promotes autonomy, supports collaborative learning, and allows learners to take responsibility for their learning as they can structure the task according to their preferable learning styles and pace thus lowering the affective filter and boosting their motivation.

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## Logged on to Learning: Internet and Life Long Learning (LLL)

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### ABSTRACT

Global expansion of information and communication technology (ICT) has changed the way we create and consume information. As of December 2011 44.8% of the users of the Internet reside in Asia. Besides collaborating on common interests people are forming virtual on-line communities to share knowledge and their life experiences. Although the rate of change in terms of usage of technology in education has been slow but the rise of Social Networks such as Facebook, Twitter, LinkedIn and You-Tube have drastically changed the way we live. Life Long Learning (LLL) is not just a mantra any more, it is taking new forms with every new technology innovation. The increasing use of the Internet is widening participation in LLL. Although politicians and educationalists have been quick to herald such initiatives as revolutionizing post-secondary education and extending learning opportunities to “anyone” on an “anytime, anywhere” basis, there has been little empirical analysis of how ICT is actually impacting LLL in the ASEAN. With this in mind, this paper attempts to explore new trends and technologies available for LLL.

**KEYWORDS:** ASEAN, Cloud Computing, Globalization, Life Long Learning, Social Networks

### 1. INTRODUCTION

What we meant by learning? Learning is defined as acquiring a new skill or knowledge. Few examples of

learning are- learning to ride a bicycle; learning a foreign language; learning to play a sport; learning a new skill or a hobby e.g. cooking or photography; learning to communicate better and learning a new technology. So next question is how do we learn? Well, you the answer already. Let us just briefly look at the various methods and means we use to learn something new. New learning may happen by taking or attending a class, reading books or magazines’, watching T.V. or movies, listening to radio, playing games, socializing with other people and now something new that has become quite mainstream all over the world over- by surfing the Internet. Global expansion of information and communication technology (ICT) has changed the way we create and consume information. In this context LLL can be defined as learning through digital connections and peer collaboration enhanced by technologies driving Web 2.0 in which users or learners are empowered to search, create, and collaborate in order to fulfill their own intrinsic needs to learn new information [1].

Based on the current trends we can divide learning and education in four major categories. With both technology-enhanced classroom teaching and with rapid expansion of Internet, the move towards on-line learning or eLearning could be seen as evolutionary, a gigantic step forward in changing the way we create and consume information [2].

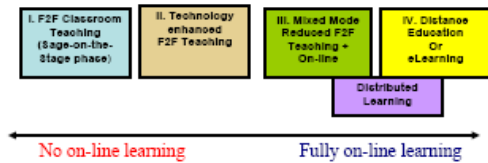


Fig. 1: Evolution of on-line learning

The biggest change is that in LLL users or learners are not just consumers, but content producers and creators. Need for LLL is depicted in Fig. 2 given below. Advent of Internet and various services on-line have enabled LLL in new ways.

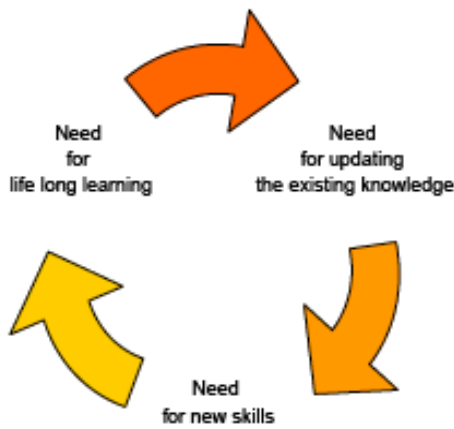


Fig. 2: Need for LLL

Many Lifelong learning and training programs are now setup for a virtual learning environment (VLE) [3].

Table-1 Mode of Delivery

| Delivery Mode     | Content on-line |
|-------------------|-----------------|
| Traditional (F2F) | 0%              |
| Web Facilitated   | 1% - 29%        |
| Blended/Hybrid    | 30%-79%         |
| Online            | 80% or more     |

As shown in Table-1 the current trends in for the mode of delivery of learning can be divided learning in four major categories. This prototypical classification is based on the Sloan Consortium papers.

The growth of on-line portals also keeps on expanding. Four major goals of LLL are shown in Fig.3. They are- Knowledge sharing, on the job training, interdisciplinary collaboration and subject specialization. Each of these goals is being met through the various resources provided on Internet. For example, subject specialization is being achieved through Google and You-Tube. One can search through Google Scholar and find pertinent information within one’s knowledge domain. YouTube can provide recorded segments on specific area such as Yoga to treat a particular muscular anomaly in the legs. The procedure can be learned by watching the clip available on YouTube.

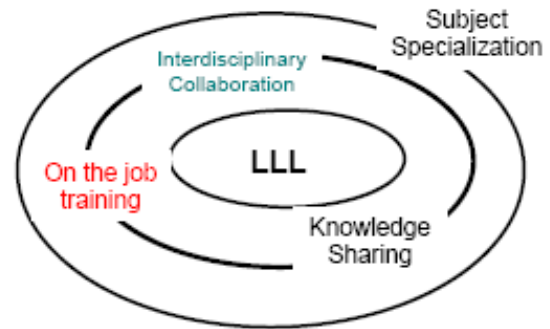


Fig. 3: Four Goals of LLL

In USA Community Colleges was setup for enhancing LLL. The primary goals of CC were to enable continuing education for masses. Extension programs in universities were also setup to enable LLL. These programs were the most popular, most current and most useful for a whole generation of people who did not want a formal degree or diploma. These programs were all about learning a new hobby, new techniques or for having a new experience. These programs became channels for LLL in their classical ways. Continuing education credits (CEUs) were provided to demonstrate that one has accomplished a certain level of expertise after taking these courses.

Even in this new century in USA, the community colleges and universities remains a means of professional development. They have also shifted learning from F2F environments to self learning through via the Internet. In addition to providing F2F courses they now provide a wide variety of courses on-line. Internet enabled LLL environment is easy and it provides:

- Ubiquitous technology support
- Access to various simulation technologies
- Balance innovation and current successful practices
- Continuous evaluation and improvement
- Training anyone to use Internet resources successfully
- Inquiry-based education and
- Provides knowledge based skills

## 2. INTERNET AND LLL- NEW CONTEXTS AND RESOURCES

It is a well known fact that in last decade using Internet technologies is more of an expectation than a novelty for today's population living in Asia. As mentioned earlier about 44.8% of the users of Internet reside in Asia. It is evident (Fig.4) that the Internet has also become an integral part of LLL in terms of accessing learning resources, communicating with peers and friends, and its overall usage. [4].

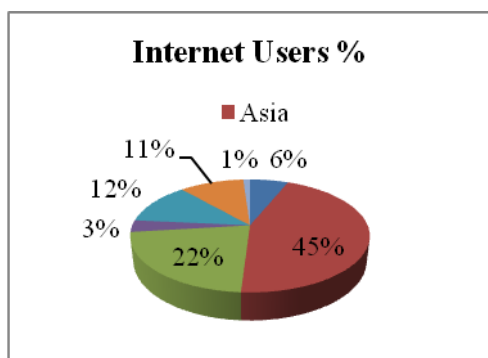


Fig. 4: Internet Users in Asia

(Source:

<http://www.internetworldstats.com/stats.htm>)

In this new century Internet and LLL has become synonymous and Google and Facebook has become new ways of finding and sharing information. According to internetworldstats.com in 2011 about 44% of the users of Internet reside in Asia. It is evident that the Internet has also become an integral part of LLL in terms of accessing learning resources, communicating with peers and friends, and its overall usage [5].

## 3. VIRTUAL WORLDS AND VIRTUAL COMMUNITIES

Internet has also created a completely new types virtual world (VW) for its young users. Despite a wide variety of definitions, the term "virtual world" is now commonly used to indicate a computer-simulated persistent spatial environment supporting synchronous communication among multiple users. The most important attribute of such as virtual world is a spatial metaphor [6]. Virtual worlds offer space where avatars, which are virtual persona representing users, walk, explore, and meet others; in particular, they are an iconic symbol (e.g., Avatar) that represents a user and facilitates spatial exploration. The second attribute of VW is persistency. When a user leaves the VW, it will not be reset and sustained. In other words, changes in the virtual world are accumulated. The third attribute is real-time communication. Virtual worlds provide an environment that allows users to synchronously communicate and interact with one another. Accordingly, these attributes of avatars and real-time communication exclude blog-styled activities that are prominent characteristics of Facebook or YouTube from the category of VWs. The last attribute of VWs is an interaction of multiple users. Such attribute stresses human-to-human

(H2H) interaction and rules out a computer game based on user-to-computer (UTC) interaction from the concept of VWs. In some ways, the concept of VWs is similar with the notion of Massive Multiplayer Online Games (MMOGs), such as World of Warcraft which has been mainly used to specify one type of VW that has a predefined theme and plot and records users' performances such as levels of achievement. Although they (or GVWs) still occupy the majority of VWs, the other distinctive VWs where users create their virtual experiences for themselves and participate in diverse social interaction have exponentially increased. For the purposes of this paper, these types of VWs are called social virtual worlds (SVWs) and are differentiated from gaming virtual worlds (GVWs). SVWs can ultimately be thought of as a metaphor (Avatar-based) 3-D virtual environment where users create their virtual experience by themselves. Second Life is a good example of 3-D virtual environment.

Another dimension online world is Augmented Reality (AR) which is increasingly becoming part of mainstream. It is having great impact in the gaming environments as well. Augmented reality (AR) is a live, direct or indirect view of a physical or real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented), by a computer. As a result, the technology functions by enhancing one's current perception of reality. By contrast, virtual reality replaces the real world with a simulated one. AR is quite commonly used in sports events,

computer games and high technologies such as aircrafts.

#### 4. SOCIAL NETWORKS AND LLL

The relevance of LLL cannot be doubted or debated anymore Steven D. Levitt and Stephen J. Dubner (2005) in their bestselling book Freakonomics emphasize the importance of information in this digital era [9].



Fig. 5: Freaknomic Book Cover

According to these authors “Information is beacon, a cudgel, an olive branch, deterrent- all depends on who wields it and how. Information is so powerful that the assumption of information, even if the information actually does not exist, can have a sobering effect.” An excellent example of power of information in the dirty world of politics is Wikileaks.

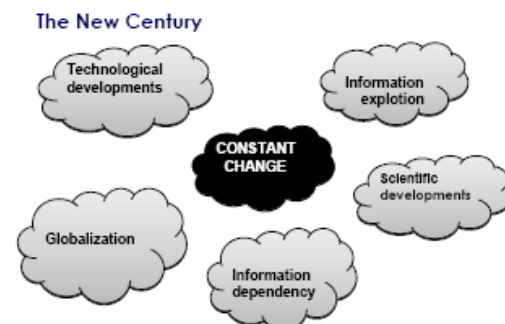


Fig 6: The 21<sup>st</sup>. Century and its challenges

The concept of cloud computing (CC) as shown in Fig.7 is based on a new paradigm in which of data and applications reside in the network or the Internet, not in the devices owned by users. Any portable device can now be used to connect to the Internet. There are three key drivers in CC that are creating a new facility for LLL.

- i. Production of new content
- ii. Access to new content
- iii. New mode of storage of content



Fig. 7: Cloud Computing (CC)

Social networking sites, over the past few years, have increased in popularity so much that many are wondering why? The foremost reason why these sites have increased in popularity is because they are free to use [7]. They do not charge a single penny to create an account, update status or to upload pictures and videos. The state-of-the-art features and moreover the ability to socialize with friends without spending a penny appeals people a lot. Above all, social networking sites are now subscribed by huge number of people with varied interests. As a result, Social networking sites continue to rise in popularity and have become a significant platform for LLL.

As of March 2012 (Fig. 8) in Asia 5% of the total population which is about more than 835,525,280 people now use Facebook for exchanging

ideas, photos, videos and everything else they come across. It has become a major playing field for all activities related directly or indirectly to LLL [8]. There are many national and regional Social Networks such as RenRen in China, Cyworld in Korea and Gree and Mixi in Japan that are subscribed by local population. Similarly there are many local Blog sites that have millions of subscribers in various countries in Asia.

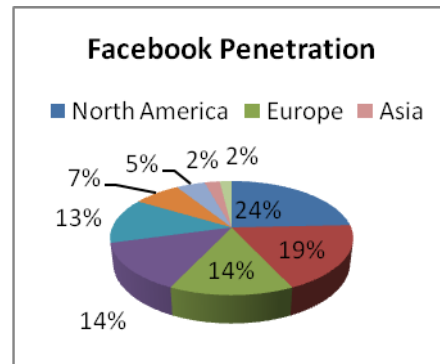


Fig. 8: Facebook Penetration in Asia  
(Source:

<http://www.internetworldstats.com/stats.htm>)

LLL is equally relevant in a work environment. Several steps can be taken to enhance LLL for enhancing productivity in the work place. A few examples are-

Give staff time to explore and share technologies for learning on their own and with colleagues, run bite size or brief sessions as these work better than full day courses and be aware that informal conversations can be more valuable and have more impact than formal instruction



Fig 9: Social Websites and Services



Key attribute of LLL is to engage with the people using new tools and technologies. Few examples of what is available on the Internet in shown in Fig.8. Evidence shows that the increasing usage of the Internet and Social Networks will likely lead to the desired impact for LLL because people learn best from:

- a) Shared resources
- b) Peer support and working together and
- c) Through formal and informal networks

However there are lots of challenges associated with LLL. Some of these challenges include time management, too many temptations, self discipline, insufficient working experience, financial constraints and peer group pressure [10].

## 5. CONCLUSIONS

For a long time the LLL is has been a natural process. In USA in particular people have been taking classes through extension course to enhance their knowledge and skills. Community Colleges in USA were setup to help with what was then called “continuing education”. Internet has bought drastic changes in accessing learning resources and the way we learn. LLL is about securing one’s future. With the improved connectivity to the cloud the LLL is becoming a self-perpetuating process- the more successful it is, the more successful it becomes. With the increasing penetration of the Internet and various on-line services such as Social Networks, LLL is drastically changing in its pace as well as in its quality. In summary, successful lifelong learners believe: attitude is everything- I will, I can and I do. Learning first, it’s never too late (or too soon) to learn something new. Internet provides

learning opportunities at all ages and in all contexts.

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## Evolution of eLearning at Assumption University

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### ABSTRACT

**The College of Internet Distance Education (CIDE) was established in 2002 within Assumption University whose purpose is to provide Internet based eLearning programs to Thai students and those in other countries. In 2003, the author was invited to work for CIDE as Director of Courseware Production Center. The author proposed Moodle, an open source LMS as the main Learning Management platform for eLearning programs at the College. The courseware production started in 2004 and has gone through some upgrades and major evolutions since then. This paper discusses the evolution of courseware production at the College of Internet Distance Education from 2004 till early 2012. This paper could be very useful for any organization that wishes to establish online training or any academic institution that plans to offer online degree programs.**

### Keywords

eLearning, Online Learning, Courseware Production, Learning Management System, Learning, Training

### 1) INTRODUCTION

Learning has probably become the most important activity in the current knowledge-based economy, which is characterized by industrial change, globalization, increased intensive competition, knowledge sharing, knowledge transfer, and the information technology. Globalization and life-long learning requires new methods of

delivering education and training. It is estimated that education and training from pre-school to retirement constitute a US\$2 trillion marketplace worldwide (Khirallah, 2000).

The College of Internet Distance Education (CIDE) was established in 2002 within Assumption University to offer online learning through the Internet. During early 2003 the executives of the College looked around searching for some commercial Learning Management Systems (LMS), the backbone software that enables the management and delivery of learning content and resources to student. Furthermore an LMS could keep track of students and activities performed by students. Most LMS systems are web-based to facilitate “anytime, anywhere” access to learning content and administration. Few companies such as BlackBoard and WebCT were contacted to demonstrate their products to the executives of the College. Due to the high price and licensing of commercial LMS, the author proposed the use of the open source Moodle as the main platform for development of courseware. There are many good reasons to use the open source software, i.e. it’s free with no pop-up advertisement, full control of options and settings, access to source code, the right to edit the code, online support forum, and modification and derivation of other software from it. Moodle was opted since it was the most promising open source LMS due to its functionality, online forum, and the number of universities and colleges around the world using it. Moodle was developed using PHP script and MySQL database which are open source programming language and database

system and therefore could be run on any platform, i.e. Windows servers, Linux, and Macintosh computers under Apache which is also an open source web server.

After approval and adopting Moodle as the LMS platform for CIDE, the author proposed hiring of 4 key personnel to form the courseware production team. The 4 positions proposed were an instructional designer, a programmer, a web/graphic designer, and a video editor. These 4 key personnel were hired by 4<sup>th</sup> quarter of 2004. The main objective of the Courseware Production Team would be to design and develop online courses suitable for eLearning environment. The contents will be added to the LMS software and this makes the LMS to become an LCMS. The Instructional Designer (ID) acts as the team leader who is responsible to constantly communicate with the Content Expert (CE) to understand the subject and its contents and to transform the material to electronic format suitable for eLearning mode. The ID at the same time seeks the expertise of other team members to accomplish the online preparation of the courses. Web programmer would be doing a very important task of understanding the coding and structure of the Moodle and to write programs to add new features and functionality to Moodle when needed. Web programmer, web designer, and the video auditor will also be closely working with the ID to design and develop online courseware.

## **2) SCIT Plus Version I**

Moodle was adopted as the Learning Management System (LMS). The courseware production team started adding features to it to satisfy the need of the College in online presentation of video lectures. This product was named “SCIT Plus” and its variant “SCIT<sup>+</sup>” in honor of the CEO of the College, Prof. Dr. Srisakdi Charmonman.

At the first step, the College executives decided to use SCIT<sup>+</sup> for preparation of the online courses for the MS in Information and Communication Technology (MS-ICT) program. Under the guidance and blessings of the CEO and CTO of the College, Program director of the School of IT and the director of Courseware Production Team adopted the video based approach for delivery of online courses. At the first trial the Audio Visual department was requested to take a video camera to the classroom where the lecturer was teaching and record the class lecture. Instructor was given a microphone to wear and the whole class lecture was recorded. This was during early 2005 when the eLearning mode was not recognized by the government of Thailand, and students were required to attend the classes in campus. After video lectures were taken, they were edited by the video editor member of courseware production team and with the cooperation of other team members, the video lecture was prepared in Windows media video (WMV) format and put on the College server, a Windows 2003 server with Apache, PHP, and MySQL (WAMP), and running the first version of SCIT<sup>+</sup>. The program to synchronize video lectures with PowerPoint slides was developed by the courseware production team and was called PowerV. This PowerV software was based on streaming technology which allows users to watch a video before a full download. Students registered for the courses could access the web-based SCIT<sup>+</sup> web-based software from anywhere and anytime to watch the video lectures using video streaming.

One major drawback of the first version was lack of clarity of video lectures as they were taken in a live classroom environment.

## **3) SCIT Plus Version II**

In order to improve the quality of the video lectures, a medium quality video camera

was acquired. The lecturers were invited to a small office turned into a small studio for video recording. The program director of the school of IT was the first one to volunteer to record his subject ICT 5001, an Introduction to Computers at the studio. Few more ICT courses followed the same pattern. The quality of video lecture was greatly enhanced. The main drawback in the previous version was overcome. The PowerV software was also updated and new features were added to this software, i.e. students could pause at any time, rewind or forward through the video or jump to a specific topic in the lecture which was considered very important for use of these video lectures. But still there was a minor problem; the videos were in Windows media video format which meant only those using a computer under Windows could watch the video lectures. Figure 1 displays a PowerV video lecture. The screen is divided into 3 windows, the window on top right is the lecturer video lecturing a topic, the big window on right is the PowerPoint slides which are synchronized with the video lecture, and the small window at the bottom right is the command center. The student can pause, rewind, forward, or select a sub-topic among the topics available to watch or study that particular topic.

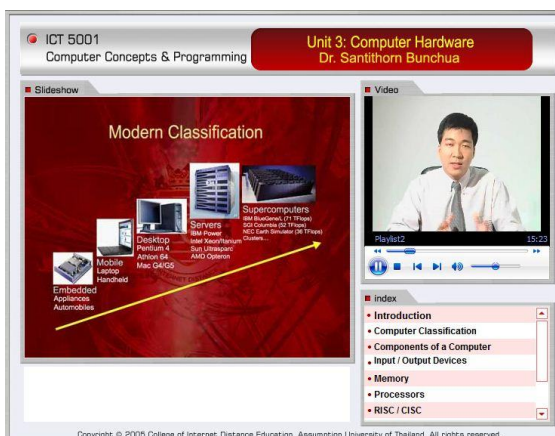


Figure 1: PowerV video presentation

One major enhancement at this stage was providing the MP3 audio format of the video lectures available on SCIT<sup>+</sup> LMS.

Students really enjoyed this feature of SCIT<sup>+</sup> as they could hear to the audio of the lectures on their mobile phones or other MP3 players anytime and anywhere. In a survey taken in 2006, students considered availability of the MP3 audio lectures as the second most important feature of SCIT<sup>+</sup> after the video lectures.

#### 4) SCIT Plus Version III

By middle of 2006, the College of Internet Distance Education spent few million Baht to create its own Radio and TV studios. During this time, the courseware production team started utilizing these studios and taking the video of lectures at these highly well-equipped and the state of art studios. At the same time a totally new version of PowerV was developed which works under Macromedia/Adobe Flash player. Flash player can be run on major platforms, i.e. Linux, Macintosh, and Windows based computers. This allowed the video lectures to be viewed under almost any personal computer. The Technology Division of the College of Internet Distance Education decided to call this new version of its software as PowerFx to be similar to FlashFx. There were many other enhancements in this version, i.e. students could choose to watch both lecturers windows and PowerPoint Windows or just view the PowerPoint Windows or change the size of the windows.

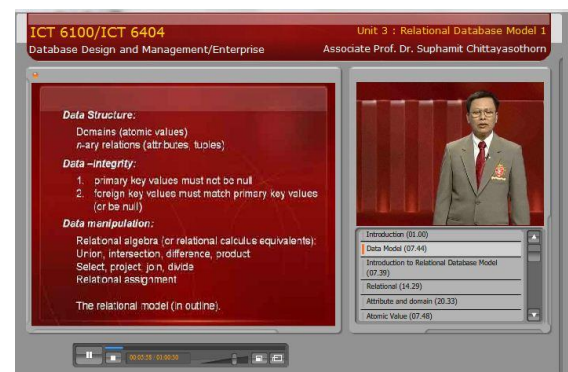


Figure 2: PowerFX video presentation

As seen in figure 2, PowerFx has a very similar displaying format as PowerV with 3 windows. Through Flash programming, the video lecture is synced with PowerPoint slides, and student can jump or select any sub-topic in a lecture. This clearly shows that the students are in command when it comes to eLearning, they can learn at any time from anywhere and with any pace.

### 5) SCIT Plus Version IV

The PowerFx became an important IT tool for playing video lectures as students just needed to download the free Adobe Flash player for their computer whether Windows based or Macintosh, or Linux boxes and watch the video lectures on the PC of their choice. During 2007 – 2010 SCIT<sup>+</sup> went through some improvements. This is the period of stabilization and improvement in PowerFx technology. All these improvements were parts of the SCIT Plus version IV.

Some of the improvements in this version include converting the text of the PowerPoint slides provided by content experts to Flash or graphics in order to improve the quality of the slides on video lectures.

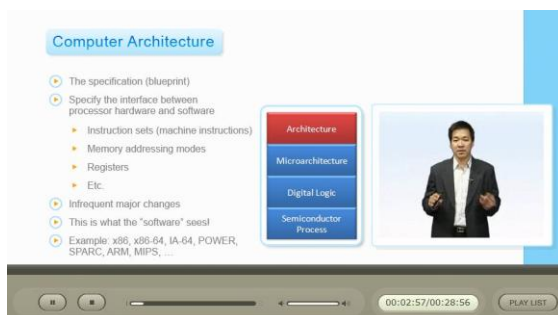


Figure 3: PowerFX video presentation

As shown in figure 3, the PowerFx went through enhancement, and the text and graphs were prepared in graphic format which made watching the video lectures much easier on the eyes. The control panel was located at the bottom, and the selection of

subtopics could be shown as popup by clicking the playlist button on the bottom left.

### 6) SCIT Plus Version IV Offline

In 2010, CIDE had a couple of students in Laos that could not watch the online lecture due to lack of bandwidth in their country. To overcome this difficulty and to provide offline access to the courseware, an offline version of PowerFx was developed so that students could watch the courseware offline with all the capabilities of the online version. The offline version of PowerFx with the courses that the student registered for were burnt on a DVD and the DVD was sent to the student for offline viewing and learning of the courses s/he registered for.

### 7) SCIT Plus Version V

Since 2004 all the courseware developed could be viewed on a computer whether under Windows, Macintosh, or Linux operating systems which meant the students had to sit behind a computer to watch the whole video lecture. There were few surveys conducted among eLearning students that found listening to audio MP3 lectures on their mobile phones or MP3 players very popular as it allowed students to listen to a lecture at any time and any place when s/he demanded so. This researcher and his team decided to prepare video lectures in such a way that could be played both on computers of any kind and also on popular mobile devices.

PowerFX could be played on any kind of PC with Windows, or Mac OS, or Linux based operating systems, but this is not a suitable choice for playing the video lectures on mobile devices for a variety of reasons, i.e. Flash needs lots of resources which is all right when run on a PC but not necessarily on a mobile device with slower CPUs and memory. Besides iPhone as one of the most popular mobile devices cannot play Flash files directly. This researcher

needed to reconsider development of the courseware from scratch so that the video lectures could play on both PCs and smart mobile phones.

In order to develop a video based lecture that could be played on both PCs and Mobile devices, this researcher decided to use MP4 videos rather than Flash videos. The procedure is shown in Figure 4 below.



Figure 4: MP4 Video Lecture Production

As shown in this Figure, a digital camera is used to take the video lecture of the Content Expert while giving the lecture. A digital camera control unit (DCCU) allows for a completely digital video acquisition and full camera picture control. Also a notebook is used that displays the PowerPoint slides prepared by the CE. A scan converter is used to capture the PowerPoint slides and convert it to MP4 format as video stream by changing the horizontal and vertical scan frequency of the video capture card on the notebook. The two outputs from DCCU and the scan converter is inputted to the video switcher (video mixer). With this device it is possible to capture the input from one of the two devices, DCCU and the scan converter, or it is also possible to mix and combine the two outputs into one output. And that is what exactly this researcher did to produce a courseware in MP4 format. Four types of output were produced for PCs and various mobile devices. A resolution of 720x576 pixel is used for videos to be played on PCs, a resolution of 450x360 is used for iPhone, a resolution of 352x288 is used for Android phones, and a resolution of 176x140 is used for

Blackberry and other phones with smaller screens. Most smart phones today can play the MP4 files. Using this technique, this researcher and his team developed and produced the latest version of video based courseware. Students now can use their PCs and/or watch them on their mobile device at anywhere when access to WiFi or 3G network is available. It is also possible to download the whole video lecture to a mobile phone and watch the lecture later at any time and any place where there is no WiFi or 3G network.

Figure 5 below displays the look of the latest version (version V) of the video lectures produced at Assumption University.



Figure 5: MP4 Video presentation

As seen in this Figure, there is only one window, the lecturer and PowerPoint slides are all located on the same window as an MP4 file which can be played on almost any computer or mobile devices such as iPhone, iPad, Android devices, etc.

Assumption University has come a long way in developing and enhancing the eLearning. As smart mobile phones and tablet computers are becoming available almost to everyone and the Thai government initiative to provide a tablet to all Thai students, this system could be used

in educating million of students all over Thailand.

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# Development of Blended E-Learning Model Using Online Interactive Reflective Learning Logs to Enhance Faculty of Education Students' Inquiring Mind and Retention at Chulalongkorn University

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## ABSTRACT

This paper is a report on the findings of a Research and Development (R&D) aiming to develop the model of blended e-Learning using Online Interactive Reflective Learning Logs (OIRLs) in order to enhance students' inquiring mind and retention, to study the result of using such model, and to purpose the model of Blended e-Learning using OIRLs to enhance students' inquiring mind and retention for further implication. The sample consisted of 8 experts in the fields during the model developing stage, while there were 40 undergraduate students for the model try out stage. *The research procedures included 3 stages: (1) model development, (2) model try out, and (3) model revision and confirmation. The research results were divided into 3 parts according to the procedures as described in the following session.* *First*, the data gathering from the literature review were reported as a draft model ; followed by the research finding from the experts' interviews indicated that the model should be included 6 components and 5 procedures to effectively enhance learners inquiring mind and their retention. The 6 components were Learning Management System (LMS), learning courseware, learning resources, communication, learning assessment, and OIRLs activity; while the procedures included: 1) blended e-Learning activity, 2) writing OIRLs activity, 3) reading and giving feedback to peers' OIRLs (instructor/learners), 4) revising OIRLs activity, and 5) reviewing OIRLs activity. *Second*, the research finding from the try out stage found that there were significant differences between pretest and posttest of inquiring mind scores, while there were no significant differences between posttest and retention scores at the .05 level for both groups (experimental group 1 and experimental group 2). When comparing between the experimental group 1 (online interactive reflective learning logs without observation, feedback, and positive reinforcement from instructor) and the experimental group 2 (online interactive reflective learning logs with observation, feedback, and positive reinforcement from instructor), the posttest scores of inquiring mind and retention scores of

experimental group 2 were higher than the scores of experimental group 1 although significant differences between such scores were not found. *Third*, according to the finding from the try out stage and the comments from the experts, the developed model was revised and proposed in the report for further implication and references.

## Keywords

Blended e-Learning, Online Interactive Reflective Learning Logs, Retention, Inquiring Mind

## 1) INTRODUCTION

In accordance with the desired characteristics of Chulalongkorn University graduates, one of the characteristics is inquiring mind, which is an inquiry capability in exploring, and comparing existing knowledge to the new knowledge. It also includes initiation of new experiment which later will lead to scientific thinking that considered one of the powerful tools to generate new knowledge. Online Interactive Reflective Learning Logs (OIRLs) in the blended learning environment can be considered as one of the tools in enhancing such capability. OIRLs is a structured online interactive reflections which learners will work in pair, then each one would be assigned to read, reflect, and share experience, with positively monitoring and suggesting by instructor. OIRLs is advantage in not only increasing interaction and communication between learners and instructors, as well as among learners, but also would help learners to thoroughly understand the concept and process of the content when interacting and

clarifying information through OIRLs. In addition to OIRLs, this research also proposed its' use along with blended e-Learning, since blended e-Learning is a combination of strength from in class and online instructions regarding content provider, activities, and assessment. By arranging the OIRLs activities through the online channel of blended learning; it would offer flexibility to the learners in both time and place manners and also serve the learners' differentiates of ways of learning. OIRLs would also consider the proper method in evaluating learner' understanding and the retention. Thus for, to support the university's policy regarding the graduates' characteristics in enhancing inquiring mind and learner retention, the purposes of this research study were to develop blended e-Learning model using online interactive reflective learning logs to enhance faculty of education students' inquiring mind and retention at Chulalongkorn University (Deaton, Deaton, and Leland, 2010; Aulls & Shore, 2008; Bonk & Graham, 2006; Khlaisang and Koraneekij, 2009; Steenson, 2006; Wilson & Smilanich, 2005).

## **2) THE RESEARCH STUDY AND THE FINDINGS**

The research objectives of this study were: (1) to develop blended e-Learning model using OIRLs to enhance Faculty of Education students' inquiring mind and retention at Chulalongkorn university, (2) to examine result from the tryout of the blended e-Learning model using OIRLs to enhance Faculty of Education students' inquiring mind and retention at Chulalongkorn university, and (3) to propose blended e-Learning model using OIRLs to enhance Faculty of Education students' inquiring mind and retention at Chulalongkorn university. Accordingly, the research methods used in this study comprised of 3 phases: Phase 1 Literature review of model components and procedures, and development of blended e-Learning model using online interactive

reflective learning logs, Phase 2 Try out blended e-Learning model using online interactive reflective learning logs, and Phase 3 Propose blended e-Learning model using online interactive reflective learning logs. The details are described as follows:

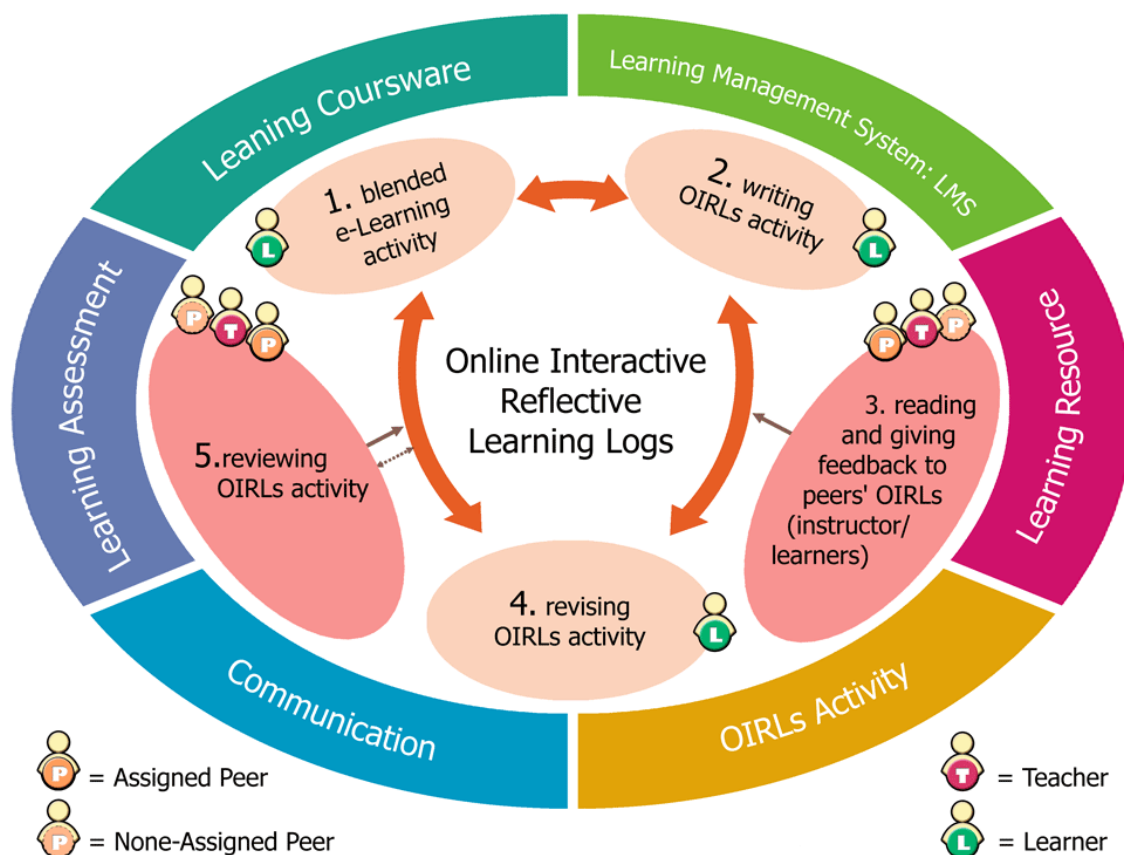
### **2.1) Phase 1 : Literature review of model components and procedures and Model development**

The sample in this phase consisted of 5 experts in the field of curriculum, instruction, and educational technology. The instruments used in this phase consisted of (1) experts' interviewing form and (2) model evaluation form. The process in this phase included: (1) the data gathering from the literature review were reported as a draft model and (2) researcher interview the 5 experts in the field of curriculum, instruction, and educational technology using the experts' interviewing form and the model evaluation form. The former result from the review of totaled 100 related literatures, which included 40 Thai literatures and 60 international literatures, found that the model should include 5 components and 5 procedures to effective enhance learners inquiring mind and their retention. The 5 components were Learning Management System (LMS), electronic courseware, OIRLs activity, communication, and learning assessment; while the procedures included: (1) blended e-Learning activity, (2) writing OIRLs activity, (3) reading and peer (instructor/assigned learner) providing comment OIRLs activity, (4) reviewing OIRLs activity, and (5) revising OIRLs activity. However, after gathering the result from the experts' interviews, some suggestions were made as follows: (1) the component of learning resources should be added to support the learners' inquiring mind; (2) Step 3 of the procedures should give chance for non-assigned peers to also read and give feedback to the reflection; and (3) Step 4-5 of the procedures should begin with revising and then reviewing the

OIRLs. Also such two steps should give opportunities for one who write reflection and one who provide feedback to be able to go back and forth repeatedly, since such process might not complete perfectly at the first time. In conclusion, based on the result of literature review and experts' interview, the development of the model should include 6 components and 5 procedures to effectively enhance learners' inquiring mind and their retention. The 6 components were Learning Management System (LMS), learning courseware, learning resources, OIRLs activity, communication, and learning assessment; while the procedures included: 1) blended e-Learning activity, 2) writing OIRLs activity, 3) reading and giving feedback to peers' OIRLs (instructor/learners), 4) revising OIRLs based on peers' feedbacks and suggestions, and 5) reviewing new findings from peers' OIRLs. The model developed from this phase is as shown in figure 1.

## 2.2) Phase 2 : Model try out

The sample in this phase included 40 undergraduate students registered in the Designing Web-Based Instruction course and the Introduction to Web-Based Instruction program courses in the first semester of an academic year 2011. The samples were divided into two groups which are 20 students for an experimental group 1 (online interactive reflective learning logs without observation, feedback, and positive reinforcement from instructor) and 20 students for an experimental group 2 (online interactive reflective learning logs with observation, feedback, and positive reinforcement from instructor). There were 6 instruments used in this phase including : blended e-Learning with OIRLs lesson plan, blended e-Learning courseware, students' inquiring mind self-assessment test, students' basic computer ability test, students' retention test, and students' satisfaction towards the model test; while the process in this phase



**Figure 1:** Development of Blended E-Learning Model Using Online Interactive Reflective Learning Logs to Enhance Faculty of Education Students' Inquiring Mind and Retention at Chulalongkorn University

were described as follows. First, the two tests including inquiring mind self-assessment test and basic computer ability test were completed by the students in order to explore the former levels of their inquiring mind and the result of the basic computer ability were used to divided students into two experimental groups. Then instructions were initiated for 9 weeks followed blended e-Learning with online interactive reflective learning logs lesson plan. After that the posttest inquiring mind self-assessment test and the retention test were conducted in order to compare learners' former and latter levels of inquiring mind and learning ability. In order to explore the learner' retention, the retention test were conducted again upon two weeks after completing the lesson. In addition, the students' satisfaction towards the model test was conducted upon completion of the lesson in order to explore the appropriateness towards the use of such model with this target group. Data were analyzed using frequency, percent, mean, standard deviation, t-test and repeated measures ANOVA. The research results indicated as follows.

### 2.2.1) Learners' Inquiring Mind

Learners who participated in the experimental group 1 and group 2 had inquiring minds' post-test mean scores significant higher than pre-test mean scores at .05 level of significance. However, when comparing inquiring minds' post-tests means score of the experimental group 1 and group 2, there was no significant different at .05 level of significance. The details are described in Table 1.

**Table 1:** Scores of Learners' Inquiring Mind

| Scores of Inquiring Mind | Exp Group 1 |      | Exp Group 2 |      |
|--------------------------|-------------|------|-------------|------|
|                          | $\bar{X}$   | S.D. | $\bar{X}$   | S.D. |
| <b>Pre-test</b>          | 109.10      | 6.38 | 111.10      | 7.10 |
| <b>Post-test</b>         | 116.70      | 7.06 | 117.85      | 7.27 |

Note: Exp Group 1 = Experimental Group 1  
Exp Group 2 = Experimental Group 2

In additional to the statistic reports, the content analysis of the inquiring mind process retrieved from the OIRLs activities also reported in order to see the process of learners developing their inquiring mind. Such process of inquiring mind development was content analyzed reported in 6 steps : (1) awareness of the happening, (2) start questioning then leading to hypothesis, (3) collecting data by using various methods, (4) analyzing raw data to meaningful and credential data, (5) synthesizing data for the further use in different situation, and (6) when gathering new data, learners are able to confirming and/or adjusting his/her own meaningful data.

### 2.2.2) Learners' Retention

Learners who participated in the experimental group 1 and group 2 had achievement's pre-test mean scores significant different than post-test mean scores, as well as retention mean score at .05 level of significance. However, when comparing post-test mean scores and retention mean scores between two groups, there were no significant different at .05 level of significance. Also, retention mean scores of both experimental groups were not significant different at .05 level of significance. The details are described in Table 2.

**Table 2:** Scores of Learning Result based on the Retention Test

| Scores of Learning Result | Exp Group 1 |      | Exp Group 2 |      |
|---------------------------|-------------|------|-------------|------|
|                           | $\bar{X}$   | S.D. | $\bar{X}$   | S.D. |
| <b>Pre-test</b>           | 16.00       | 2.68 | 15.90       | 3.16 |
| <b>Post-test</b>          | 22.95       | .69  | 24.10       | .65  |
| <b>Retention-test</b>     | 23.45       | .71  | 23.70       | .68  |

Note: Exp Group 1 = Experimental Group 1  
Exp Group 2 = Experimental Group 2

### 2.2.3) Learners' Satisfaction

Considering result from students' satisfaction towards the model test, it was found that learners rated the satisfaction towards the model at the high level for experimental group 1 and at the highest

level for experimental group 2 ( $\bar{x} = 4.18$  and  $\bar{x} = 4.24$  respectively). When considering each item, the report was shown in figure 2.

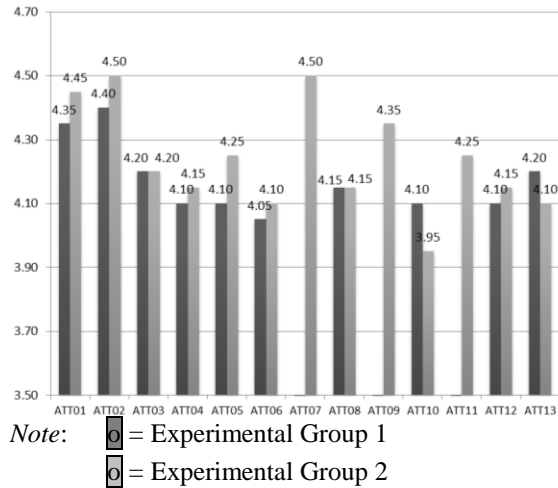


Figure 2: Learners' satisfaction towards the Blended E-Learning Model Using Online Interactive Reflective Learning Logs

According to figure 2, the description of each item are as follows: (1) lecture and demonstration in face to face class are clear and applicable, (2) learning courseware on Blackboard Learning Management System is significant for reviewing course contents for in-depth understanding, (3) OIRLs activities through blog helps learners to review both concept and process of learning, (4) by reading and commenting peers' OIRLs is meaningful for learning, (5) by reading peers' comment and revising OIRLs is meaningful for learning and in-depth understanding, (6) by reviewing new finding from peers' OIRLs, it has enhanced analyzing ability, (7) comment and suggestion from instructors enhance data searching and collecting abilities, (8) supportive feedback from peers enhance motivation in data searching and collecting abilities, (9) supportive feedback from instructor enhance motivation in data searching and collecting abilities, (10) learning resource as suggested from peers through OIRLs enhanced learners'

inquiring process and inquiring mind, (11) learning resource as suggested from instructor through OIRLs enhanced learners' inquiring process and inquiring mind, (12) OIRLs activities enhance learners' inquiring mind, and (13) OIRLs activities enhance learners' retention.

When considering Learners' satisfaction towards the Blackboard Learning Management System, it was found that the overall satisfaction was at the high level for both experimental groups ( $\bar{x} = 4.06$  and  $\bar{x} = 3.94$  respectively). When considering each item, the report was shown in figure 3, while the description of each item are as follows: (1) accessibility to e-courseware on Blackboard LMS, (2) accessibility to discussion on Blackboard LMS, (3) accessibility to OIRLs blog on Blackboard LMS, (4) accessibility to review and feedback to peers' OIRLs blog on Blackboard LMS, (5) accessibility to revise OIRLs blog on Blackboard LMS, (6) accessibility to complete assessment of inquiring mind self-assessment test and, learning ability test, and (7) accessibility to complete authentic assessment and presentation through Blackboard LMS.

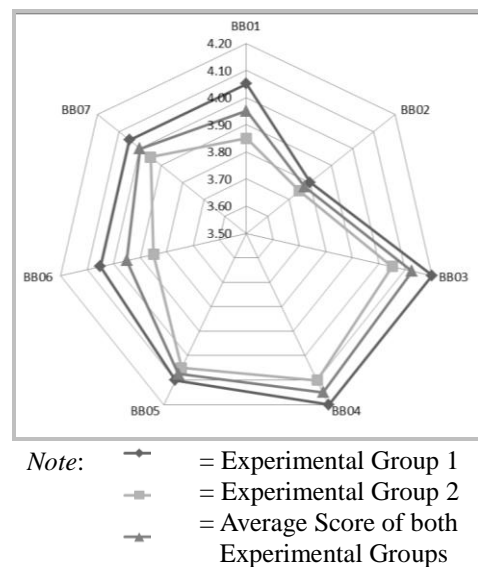


Figure 3: Learners' satisfaction towards the Blackboard Learning Management System

### **2.3) Phase 3 : Model revision and confirmation**

The 3 experts considered that blended e-Learning model using online interactive reflective learning logs had the highest level of appropriateness towards the enhancement of inquiring mind and learners' retention. The detail of each dimension of consideration included: (1) model rationale, (2) model purposes, (3) model illustration, (4) model components, (5) model procedures, (6) appropriateness of the model towards enhancement of inquiring mind and learners' retention, and (7) overall of the model is appropriate and applicable. Though, experts had informative suggestions to the study. Some of them, for example, adding details of the role of none assigned peers which is interesting but hardly mention in the report; there was the time constraint for learners towards the OIRLs activities; and learning strategies should be considered to be certain that the model will work effectively and efficiency. When first introduce OIRLs to the learners, instructors should monitor the steps strictly, then later on might be able to let learners accomplish their own activities. Last but not least, both inquiring mind and retention should be followed up an may compared with the traditional instruction whether there will be different found in both groups.

### **3) DISCUSSION AND CONCLUSIONS**

According to the analysis and synthesis of the related review literatures, the experts' interviews, the model tryout, and the suggestion from the experts, discussion and conclusions of the report is described as follows:

#### **3.1) Appropriateness of the Model towards Enhancement of Inquiring Mind**

According to the try out phase, it was found significant difference at the 0.05 level in pre-test and post-test mean scores of inquiring mind in both groups, however when compared post-test mean scores of both groups, significant differences were

not found. Based, on such finding, it can be concluded that the model can effectively enhance learners' inquiring mind. Since the scores of group 2 were higher than scores of group, it may be implied that OIRLs with peer and instructor's feedbacks could enhance learners' inquiring mind better than the OIRLs with only peer feedbacks. However, since significant differences were not found, it could be concluded that both types of OIRLs were applicable and could be used interchangeably. In fact, when considering the first three steps of model procedures, it can be found that use of blended e-Learning can enhance opportunities for learners to experience, review for in-depth understanding from both in class and online activities, such as class demonstration, brainstorming activities, practice, and presentation, then shift from in class to online further discussion, and presentation of projects through blog. Such activities presenting the fine transition from face to face to online activities. Then step 2 of the procedure which learners had chances to write OIRLs would present whether learners really understand the concept of the course content, as well as learning process. To support such implication, based on the learners' survey of their satisfaction, they expressed that in class lecture and demonstration from the lecturers helped them to understand concept of the course content in both experimental groups ( $\bar{x} = 4.35$  and  $4.45$  respectively); and by reviewing learning courseware, it has enhanced their understanding ( $4.40$  and  $4.50$  respectively). When writing OIRLs, it helped learners to review both course content, as well as learning process which represent in the same mean scores in both group ( $\bar{x} = 4.20$ ). In addition to the statistic report, the content analysis also presented, some of the outstanding one is selected as presented in the follows. *"..by exploring learning courseware and in class discussion , it really helped me in understanding the course content clearer and deeper, ..I*

*really enjoy sharing resources among learners*". Then in step 3 reading and giving feedback to peers' OIRLs (instructor/learner), it was found that learners in both groups really enjoyed receiving the comments and supports which could turn out to be positive reinforcement for their learning ( $\bar{x} = 4.10$  and  $4.15$  respectively). In step 4 revising OIRLs based on peers' feedbacks and suggestions, quite difference were found when compared experimental group 1 (only peers' feedback) and experimental group 2 (peers and instructor's feedbacks). Learners expressed informative feedback from peers and/or instructor were helpful in drawing conclusion for the learning at high level of group 1 and highest level for group 2 ( $\bar{x} = 4.10$  and  $4.25$  respectively). In step 5, reviewing new finding from peers' OIRLs, in which group 1 got the review from only peers, when group 2 got review from both instructor and peers, learners opinionated that when reviewing new finding from peers' OIRLs, it was at high level for group 1 and highest level for group 2 ( $\bar{x} = 4.05$  and  $4.10$  respectively). Overall, The OIRLs has enhance inquiring mind and learners' retention for both group at high level ( $\bar{x} = 4.10$  and  $4.15$  respectively). Such conclusion and discussion are congruence to the work of Tungteerabunditkul (1999) and the work of Li, Moorman, & Dyjur (2010) addressed that in enhancing learners' inquiring mind, instructors' supportive and learning environment emphasizing interesting content, challenging activities with collaboration have played vital roles. The conclusion and discussion of this research are also congruence with the work of Steenson, C. (2006), Konold, K.E. et.al. (2004), and Smith and Gorard (2005) mentioned about the effectiveness of learning logs to give formative feedbacks authentically.

### **3.2) Appropriateness of the Model towards Enhancement of Retentions**

According to the try out phase, it was found significant difference at the 0.05 level in pre-test and retention mean scores in both groups, however when compared retention mean scores of both groups, significant differences were not found. Based, on such finding, it can be concluded that the model can enhance learners' retention. Though the scores of group 2 were higher than scores of group 1, it could be implied that OIRLs with peer and instructor's feedbacks could enhance learners' retention better than the OIRLs with only peer feedbacks. However, since significant differences were not found, it could be concluded that both types of OIRLs were applicable and could be used interchangeably. Based on the model procedures including (1) blended e-Learning activity, 2) writing OIRLs activity, 3) reading and giving feedback to peers' OIRLs (instructor/learners), 4) revising OIRLs based on peers' feedbacks and suggestions, and 5) reviewing new finding from peers' OIRLs, these procedures can effectively enhance learners' retention. With the flexibility of blended learning which activities can occur both in class and online modes of communication. In fact, in class can enhance learning ability in drawing conclusion through the brainstorming activities with peers and the support from instructors, while online activities offer chance for learners to think, process their thought, ask questions, and even review the course materials without the time and place constraint. Such conclusion and discussion are congruence with the work from Collopy and Arnold (2009) discussed about the benefits of blended learning course over the completed online courses. In addition, based on the feedback from learners, it was found that learners rated the highest scores on both experimental group one and two ( $\bar{x} = 4.35$  and  $4.45$  respectively) in the point that the lectures and demonstration in class have helped

learners to understand concepts and gained skills related to the course contents. Learners also rated the highest scores on both experimental group one and two ( $\bar{x}$  = 4.40 and 4.50 respectively) in the point that online course content materials and additional resources have helped learners to enhance their understanding of concepts and gained skills related to the course contents. Concerning the OIRLs activity, it has helped enhancing learners to review and fulfill knowledge in addition to what they learned. When considering the activities that learners wrote OIRLs with their own language through blog enhanced learners' understanding of concepts and process, learners in both groups rated at high levels ( $\bar{x}$  = 4.20 for both groups). Learners also opinionated that writing OIRLs enhanced their retention, it was at high level for both group 1 and group 2 ( $\bar{x}$  = 4.20 and 4.10 respectively). In addition to the statistic report, the content analysis also presented, some of the outstanding one is selected as presented in the following. *"..writing OIRLs is considered to be a positive reinforcement which lead me want to be improved"* Such conclusion and discussion are congruence to the work of Rusemeprome (1989). mentioned about the meaningful content would enhance retention, and the work of Khakhai (1997) indicated collaborative work and reflection would enhance retention. The research conclusion is also congruence with the work of Deaton, Deaton, and Leland (2010) discussed about the effectiveness of interactive reflective logs to enhance communications among learners, peers, and instructors which will later lead to the trustworthy, belonging of learning community, and eventually more understanding of learning. Further suggestion, based on the learners' feedback, the tools or the system offered more flexibility in writing and correcting OIRLs are needed to further investigate. Also, according to the desired characteristics of Chulalongkorn University, inquiring mind is one of such

desired characteristics. Thus for, the blended e-Learning model to enhance other characteristics, for example, public mind and leadership should also be in consideration.

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**Towards the e-Learning Excellence:  
Learners' satisfaction of the new e-Learning system  
at Sripatum University<sup>1</sup>, Thailand**

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**ABSTRACT**

Sripatum University (SPU) Thailand, is the winner of the inaugural National Best Practice for e-Learning Management at the Higher Education level in 2011, from the Office of the Higher Education Commission (OHEC), Ministry of Education (Thailand). As SPU is entering into the new era of its e-Learning evolution, it is important to maintain quality of the overall process, including learners' satisfaction. Therefore, Office of the Online Education (OOE), the responsible body looking after e-Learning of SPU has conducted a quantitative study to measure learners' satisfaction at the end of second semester, academic year 2011. The aims of this study were to 1) Identify the learners' satisfaction during academic year 2011 towards the e-Learning system; and 2) To apply the findings for improvement of the system to better meet the needs of the learners. Research population included students at undergraduate level of SPU (main campus). 709 students participated in the survey. The findings revealed that 1) learners are very satisfied with the e-Learning system; 2) learners are very satisfied with the component of the web <http://e-learning.spu.ac.th> 3) learners are very satisfied with the e-learning system at overall level; and the learners have high expectation for the system in the future.

**Keywords:**

- online education, learner's satisfaction, e-Learning, quality assurance, Sripatum University

**Online presentation file of this paper (Prezi):**

- <http://goo.gl/noj0Y>

**I. Introduction**

It is a widely acceptable fact that technology changes quickly and continuously. Advancing technology has an unavoidable impact on teaching and learning process. Learning nowadays can occur not only in the classroom, but also anywhere or anyplace and even anytime with the help of technology. Learners can learn virtually from variety of sources, including from lessons provided or even from the surrounding environment. Thailand National ACT (1999) provides a framework for citizen of Thailand that they should have equal opportunity for Lifelong Learning with quality access and contents across the whole process (Ministry of Education, 1999).

Teaching and Learning process utilizing new educational technology as well as emerging information technology could effectively bring the best learning outcome possible. Learners can learn and practice whenever they want, wherever they want in asynchronous or synchronous modes depending on the lessons provided. Educational institutions play a vital role in selecting proper technology to support the process. This can be seen as a new paradigm for online education or e-Learning of the 21<sup>st</sup> century.

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<sup>1</sup> Sripatum University (SPU): Awarded the National best practice in e-Learning Management at Higher Education Level by the Ministry of Education, Thailand on September 8, 2011.

Na Songkla (2004) mentions that online teaching and learning over the web requires a combination of individual study method, World Wide Web technology, and computer networking for a creation of online lesson and activities. A web based courseware requires the following components:

1. Interaction of teaching and learning on the web. This includes interaction between the learners and the hypermedia provided, and between the learners and the teachers. These can be further explained as the followings.

1.1. Learning-Content Interaction: Refer to activities in the form of hypermedia contents that have been clearly structured by the teachers, therefore interaction between contents and the learners are in a clearly defined way

1.2. Learners-Teachers and Learners-Learners Interactions: Refer to activities that promote learning from exchanging conversations between individuals

2. Dimension of time. Refers to teaching and learning process in two ways. Learning can take place at the same time altogether, or at a different time. These can be further explained as the followings.

2.1. Synchronous Mode: This method requires learners to join the online classroom at the same time. Teachers can provide the learners with immediate feedback and prompt interaction. This method is useful for teaching and learning process that requires instant communication or conclusion. Tools required for this method includes e-Lecture and other real-time means such as video conferencing, white/electronic board, as well as programs that allow sharable of resources

2.2. Asynchronous Mode: Learning at different time: This method is an opposite to the synchronous technique as it does not require learners and teacher to be online at the same time. Learning process can occur with the help of technology such as hyperlinks, email, forum, and web board

3. Teaching and assessment methodologies.

Teaching and learning online is somewhat similar to the in-class process, in the sense that teachers guide the learners to learn. This can also be referred to as the students centric or students centered approach. With this concept, teachers should therefore assess learning outcome of the learners. These can be further explained as the followings.

3.1. Teaching Methodologies: Refer to 1) teaching with objectives (Objectivist / Insurrectionism); and 2) cognitivist

3.2. Assessment Methodologies: Refer to assessing students' performance on the web. Assessment is a key component of the teaching and learning process. Although learners and teachers are not physically in the same place, but technology still enables both formative and summative evaluations via the web. In addition, like in traditional classroom, teachers can still measure 1) learner's outcome as well as 2) authentic assessment.

Application of technology to facilitate online education including e-Learning is considered as an effective way of modern education. Ross and Schulz (1999) mention the flowing advantages of teaching online:

1. Better individual learning
2. Ease of finding resources as the information are provided online at a common place or with search mechanism
3. Better support curriculum based education
4. Effective supplement or compliment tools for the learning process
5. Motivate the learners' interest in education

e-Learning with technology supported has been widely used in many universities across the world and in variety of ways including e-Learning as a complement, as a supplement, or as a replacement of the traditional classroom. It is fair to say that e-Learning could make learning more interesting, fun, and engaging. e-Learning as a system often introduced via Learning Management System (LMS) that has effective Content Management System (CMS) as a component. However, despite having the latest technology or state of the art LMS, but it is the management process that likely to define success or failure of the e-Learning.

## II. Sripatum University and the new e-Learning

Sripatum University or SPU (Thai: มหาวิทยาลัยศรีปทุม) is a leading private university in Thailand. Inspired by the vision of Dr. Sook Pookayaporn, who wanted to give Thai youths the chance to develop their full potential, SPU was founded on May 28, 1970 under the name Thai Suriya College. The college later was promoted to university status. "Sripatum" means the "Source of Knowledge Blooming like a Lotus" and was graciously conferred on the college by the Her Royal Highness the late Princess Mother Srinagarindra (Somdet Phra Srinagarindra Baromarajajanan). She presided over the official opening ceremony of SPU and awarded vocational certificates to the first

three graduating classes. Sripatum University is therefore one of the first five private universities of Thailand. Presently, SPU is offering quality teaching and learning across three campuses:

1. Bangkok: Main Campus in north of Bangkok
2. Phyathai Campus: For Executive Programs located in CBD area
3. Chonburi Campus: Located near the country's Eastern Seaboard

SPU has been practicing e-Learning for over a decade. In the early time, e-Learning team at SPU was a small division within SPU Media Center, or later under the SPU ICT center. During those periods, SPU was using e-Learning on a minimum basis, as a complement to classroom based education.

As SPU aims to deploy online education at a larger and more effective scale, in June, 2011 the University Council has approved a newly formed Office of Online Education (OOE), to overlooking the whole online education process and management of the university.

OOE has been set up to be leader in educational technology for SPU. It is the central body supporting and driving the university as a whole for excellence in in-class online teaching and learning as well as distance education. OOE utilizes sufficiency economy method for sustainable development and online education eco-system of the modern era.

SPU is now entering into new era of online education. Immediately after its establishment, OOE has introduced Moodle as the common LMS for the university, together with an integrated automated class-recording system. Lecturers can now record his or her teachings virtually hassle free. The recording process can take place in a real classroom or anywhere at any time, and it will be displayed automatically in the associated online class room in the Moodle at no time.

This may look like a simple process; however, considering this is a process that all lecturers at the university are doing on a common basis, it is actually a massive operation of change management. In addition, most lecturers can now be able to add contents to the Moodle following the ADDIE model (ADDIE Model, 2011), administrate online activities, as well as developing and deploying quiz banks by self; this has really put SPU into a strong position for effective online education. All these have been made possible because of strong support from OOE under the clear policy from top management at SPU.

As a result, SPU has been awarded an inaugural National Best-Practice in e-Learning Management at Higher Education Level from the Ministry of Education, Thailand in the Annual National Academic Seminar of the Office of the Higher Education Commission on September 8, 2011.

### III. Learners' Satisfaction Survey

Despite having a strong e-Learning management, SPU is striving to ensure that the e-Learning is developing into a proper and effective way across the whole process. This includes the fact that learners should be satisfied with the system provided. Therefore, OOE is constantly monitoring the learners' satisfaction by conducting series of quantitative survey to measure the level of approval from the learners.

A study has been set up to measure learners' satisfaction for undergraduate students of the academic year 2010. Objectives of the study were to:

1. Measure learners' satisfaction towards the system provided; and
2. Analyze the findings as a guideline for future development

Data collection period was between March and May 2012. Research population includes all SPU

Undergraduate students at Bangkok campus in academic year 2011. Research tool used was a printed survey with three set of questions, which are: 1) Demographic information, 2) Satisfaction towards the system provided, and 3) Expectation for future services.

The questions are put together based on extensive literature review from peer-reviewed publications, research, and studies including Waiwong (2006), Sukhawarot (2006), Plungkiettiyot (2004), Traimpho (2004), Na Songkhla (2004), Shih (1998), Rossand Schulz (1999), and Ministry of Education (1999). The survey was then being sent to three experts in educational technology area with at least a Ph.D. qualification and at least three years of experience in educational technology field at national level for validation.

One thousand survey form was printed and distributed to the students randomly on Tuesdays and Thursdays, which are the busiest study days of the week. 709 students participated in the survey, which is accounted for 70.90% of the total form distributed.

For the Demographic information, Frequency and Percentage were used as a statistical tool for data analysis; whereas the Mean and Standard Deviation were used to analyze learners' satisfaction and their Expectation for Future Services (Kannasoot, 1995).

### IV. Findings

Although result from several parts of the survey remains confidential and cannot be discussed in public, it can be confirmed that:

1. The learners are very satisfied with the e-Learning system provided:
  - $\bar{x} = 3.72$ , S.D = 0.92
2. The learners are very satisfied with the component of the e-Learning website: <http://elearning.spu.ac.th>
  - $\bar{x} = 3.71$ , S.D = 0.85

3. The learners are very satisfied with overall services of the system provided:
  - $\bar{x} = 3.91$ , S.D = 0.88
4. The learners are very satisfied with a promise of future improvement of the system:
  - $\bar{x} = 4.06$ , S.D = 0.82

## V. Conclusion

The study has revealed that the learners are very satisfied with the new e-Learning system provided. This can be seen as a motivation and inspiration for future development. However, the new e-Learning system at SPU is still at its early stage, and many improvements are expected along the way. Quality assurance of the whole process as well as continuous development of the system will need to be clearly addressed, defined, and implemented. With the strong support from top management at SPU and the dedicated teamwork of OOE, future of the new e-Learning system at the university looks brighter than ever.

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# Development of Pedagogical Blended E-Learning Model Using Cognitive Tools Based Upon Constructivist Approach for Knowledge Construction in Higher Education

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## ABSTRACT

This paper is a report on the findings of a Research and Development (R&D) aiming to develop the model of pedagogical blended e-Learning model using cognitive tools based upon constructivist approach for knowledge construction in higher education, and to examine the result of using such model. The sample consisted of 8 experts in the field during the model development stage, while there were 21 undergraduate students (11 and 10 students for each experimental group respectively) for the model try out stage. *The research procedures included 3 stages: (1) model development, (2) model try out, and (3) model revised and confirmation. The research results were divided into 3 parts according to the procedures as described in the following session. First,* the data gathering from the literature review were reported as a draft model. Then, the research finding from the experts' interviews indicated that the model should include one generic model with three sub models for learners to effectively construct their knowledge. The generic model included three elements and three procedures, while each sub model included four elements and three procedures with 7 steps which elaborated from the generic one. The three elements of the generic model comprised of (1) instructor's and learners' active roles, (2) activities, and (3) assessment, while the procedures included (1) pre-instruction, (2) instruction with cognitive tools, and (3) evaluation with process and product. Regarding the sub models, all three sub models comprised of the same 4 elements including (1) instructor's and learners' active roles, (2) pedagogical based activities, (3) cognitive tools, and (4) assessment, while the 3 procedures with 7 steps were different according to the pedagogy applied to each model. The pedagogy included Collaborative Discussion-Based Learning (CDBL), Collaborative Project-Based Learning (CPjBL), and Collaborative Problem-Based Learning (CPBL). *Second,* the research finding from the try out stage found that there were significant differences between pretest and posttest of knowledge construction's scores at the .05 level for both groups (experimental group 1 using synchronous interaction-based cognitive tool, and experimental group 2 using asynchronous interaction-based cognitive tool), while the

observation and projects' scores of each sub model tryout were also increased for both groups. When comparing between the experimental group 1 and the experimental group 2, the posttest scores of knowledge construction of experimental group 1 were higher than the scores of the experimental group 2 although significant differences between such scores were not found. Likewise, when comparing the observation and projects' scores, the scores of experimental group 1 were slightly higher than the scores of experimental group. Concerning the satisfaction scores, both experimental groups rated as very high satisfaction to the model. *Lastly,* according to the finding from the try out stage and the confirmation from the experts, the developed model was revised and presented in the report for implication and further references.

## Keywords

e-Learning, Pedagogical Blended e-Learning, Cognitive Tools, Constructivist Approach, Knowledge Construction

## 1) INTRODUCTION

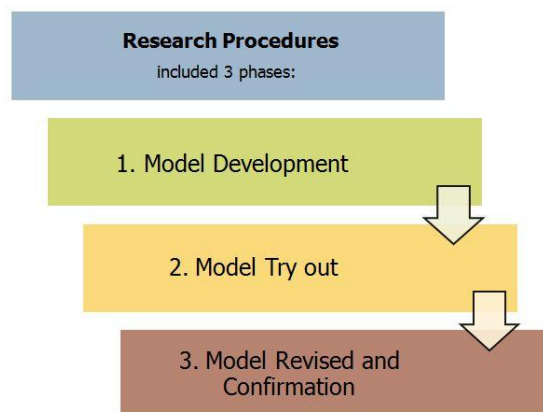
Nowadays, implication of e-Learning has increased rapidly in higher education since it has been considered to be one of the solutions for learning limitation with the time and place constraints. Besides, with the benefits gained from web2.0 technologies, it has increased communication channel between instructor and learners, as well as among learners themselves. However, many times, instructors seem to neglect to apply appropriate pedagogy in which will enhance learners' knowledge construction, when teaching in e-Learning environment. Such e-Learning, pedagogy could be named, for example, Project-Based Learning, Problem-Based Learning. Thus for, this research has proposed pedagogy blended e-Learning model which is combination of strength of various

teaching methods, strategies, and technologies. Based on the findings, such model would enhance learners' opportunities to access to the contents, to participate in the activities, and to exchanges and brainstorm among learners through online social network which will lead to learners' knowledge construction in higher education. The construction of the knowledge in this study was emphasized on cognitive domain addressed in Bloom (2001) comprised of 2 levels – the lower level including remembering, understanding, and applying and the higher level including analyzing, evaluating, and creation. Such domain would look in 4 dimensions including (1) factual knowledge, (2) conceptual knowledge, (3) procedural knowledge, and (4) meta-cognition knowledge.

## 2) THE RESEARCH STUDY AND THE FINDINGS

The research objectives were to develop pedagogical blended e-Learning model using cognitive tools based upon constructivist approach for knowledge construction in higher education. While the three detail objectives are addressed as follows: (1) to examine review of literatures, as well as experts' opinion, towards the most popular top three pedagogies used in e-Learning environment, (2) to develop the models according to the most popular top three pedagogies used in e-Learning environment, integrated with 6 types of cognitive tools in order to enhance knowledge construction, and (3) to tryout the effectiveness of the model which developed under the most popular top three pedagogies used in e-Learning environment, integrated with 6 types of cognitive tools. Hence, the research methods used in this study comprised of 3 phases in accordance to the objectives: **Phase 1** Literature review of model components and procedures, and development of pedagogical blended e-

Learning model, **Phase 2** Trying out pedagogical blended e-Learning model, and **Phase 3** Proposing pedagogical blended e-Learning model. Figure 1 illustrates research procedures, while the details are described in the following session:



**Figure 1** Research Procedures

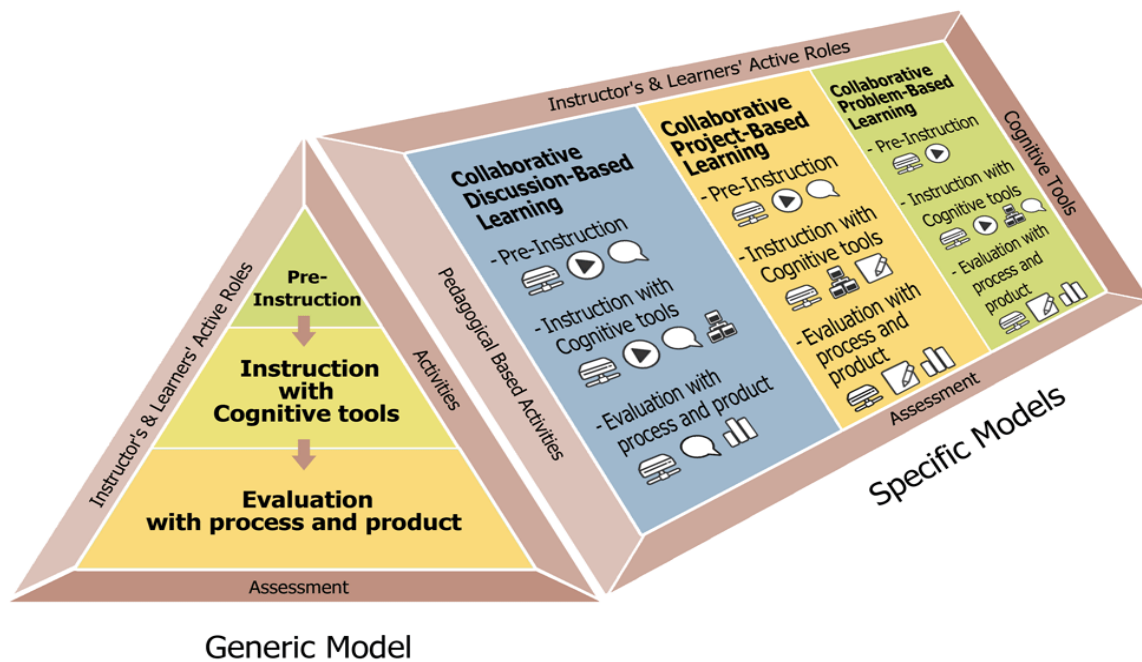
### **Phase 1 Literature review of model components and procedures and Model development**

The sample in this phase consisted of 5 experts in the field of curriculum and instruction, educational technologies, and educational measurement and evaluation. The instruments used in this phase consisted of (1) experts' interviewing form and (2) model evaluation form. The process in this phase included: (1) the data gathering from the literature review were reported as a draft model and (2) researcher interviewed the 5 experts in the field of curriculum and instruction, educational technologies, and educational measurement and evaluation. using the model evaluation form. The former result from the review of totaled 180 related literature (75 Thai literature and 105 International literature) found that the model should include one generic model with three sub models for learners to effectively construct their knowledge. The generic model included three elements and three procedures, while each sub model included four elements and seven procedures which elaborated from the generic one. The three elements of the



generic model comprised of (1) instructor's and learners' roles, (2) activities, and (3) assessment, while the procedures included (1) pre-instruction, (2) instruction with cognitive tools, and (3) evaluation. Regarding the sub models, all three sub models comprised of the same 4 elements including (1) instructor's and learners' roles, (2) pedagogical based activities, (3) cognitive tools, and (4) assessment, while the 7 steps were different according to the pedagogy applied to each model. The pedagogy included collaborative discussion-based learning (CDBL), collaborative project-based learning (CPjBL), and collaborative problem-based learning (CPBL). However, after gathering the result from the experts' interviews, some suggestions were made as follows: (1) the three sub models should include 3 major procedures with the details of 7 minor steps in total; (2) the names of cognitive tools should be addressed; and (3) the evaluation should give emphasized on both process and product which could be retrieved such outputs by scores from the examination, the project rubric, as well as the observation form. Also, the roles of instructors and learners should be active which will be congruence with the concept of cognitive constructivist learning environment. In conclusion, based on the result of literature review and experts' interview, the development of the model should include one generic model with three sub models for learners to effectively construct their knowledge. The generic model included three elements and three procedures, while each sub model included four elements and three procedures with seven steps which elaborated from the generic one. The three elements of the generic model comprised of (1) instructor's and learners' active roles, (2) activities, and (3) assessment, while the procedures included (1) pre-instruction, (2) instruction with cognitive tools, and (3) evaluation with process and product. Regarding the sub models, all three sub models comprised of 4 elements including (1)

instructor's and learners' active roles, (2) pedagogical based activities, (3) cognitive tools, and (4) assessment, while the procedures included : (1) pre-instruction, (2) instruction with cognitive tools, and (3) evaluation with process and product. However, the detail seven steps of each are different according to the applied pedagogy that could be described in the followings. **CDBL** comprised of the following steps: (1) content outline and timeframe were presented, (2) objectives for discussion were presented, (3) resources for discussion were prepared, (4) course and group database were placed for discussion, (5) cognitive tools were used to find out solution according to the assigned discussion topics, (6) findings were presented with review and comments from peers, and (7) content reflection was placed through online group learning log. **CPjBL** comprised of the following steps: (1) project objectives were addressed, (2) group project was initiated tentatively through group database, (3) group plan was brainstormed through group database, (4) group project was developed collaboratively with various types of cognitive tools, (5) group project was presented with the use of cognitive tools, (6) group project was evaluated with the use of cognitive tools, and (7) content reflection was placed through online group learning log. **CPBL** comprised of the following steps : (1) facts related resources were prepared for learners, (2) activity objectives were presented and problems were specified , (3) problem evaluation process and solution were presented through the use of cognitive tools, (4) group plan was presented through cognitive tools, (5) hypothesis, synthesis, and solution were presented through the group database, (6) evaluation was examined for content understanding, (7) content reflection was placed through online group learning log. The model developed from this phase is as shown in figure 2.



**Figure 2:** Pedagogical Blended E-Learning Model Using Cognitive Tools Based Upon Constructivist Approach for Knowledge Construction in Higher Education

**Phase 2 Model try out**

The sample in this phase included 21 undergraduate students registering in the Designing Web-Based Instruction course and the Introduction to Web-Based Instruction program courses in the second semester of an academic year 2011. The samples were divided into two groups which are 11 students for an experimental group 1 (synchronous interaction-based cognitive tool) and 10 students for an experimental group 2 (asynchronous interaction-based cognitive tool). There were 7 instruments used in this phase including : pedagogical blended e-Learning using cognitive tools based upon constructivist approach lesson plan, cognitive tools, students' basic computer ability test, students' knowledge construction test, students' knowledge construction observation form, students' knowledge construction rubric, and students' satisfaction towards the model test. While the process in this phase were described as follows. Firstly, the two tests including students' basic computer ability test and students' knowledge construction test, were completed by the students in order to explore the former levels of their knowledge and the result of the basic computer ability were used to divided

students into two experimental groups. Then instructions were initiated for 15 weeks followed pedagogical blended e-Learning using cognitive tools based upon constructivist approach lesson plan which divided into 3 modules according to the proposed models. The three modules included (1) Collaborative Discussion-Based Learning: CDBL (three week duration) for, (2) Collaborative Project-Based Learning: CPjBL (seven week duration) and (3) Collaborative Problem-Based Learning: CPBL (five week duration). After that the posttest of knowledge construction test were conducted at the end of each module in order to compare learners' former and latter levels of knowledge construction. In order to gain in-depth data concerning construction of knowledge, the learners' process of knowledge construction were observed through the online learning environment using the observation form. In addition, the students' satisfaction towards the model test was conducted upon completion of the lesson in order to explore the appropriateness towards the use of such model with this target group. Data were analyzed using frequency, percent, mean, standard deviation, and dependence and independence t-tests.

The research results indicated as follows.

**2. 1 Learners’ Knowledge Construction**

Learners who participated in modules 1-3 both the experimental group 1 and group 2 had knowledge construction’ post-test mean scores significant higher than pre-test mean scores at .05 level of significance. However, when comparing knowledge construction’ post-tests means score of the experimental group 1 and group 2, there was no significant different at .05 level of significance. Though, the post-tests means score of the experimental group 1 were higher than score of the experimental group 2 in all three modules. The details are illustrated in Table 1 and figure 3.

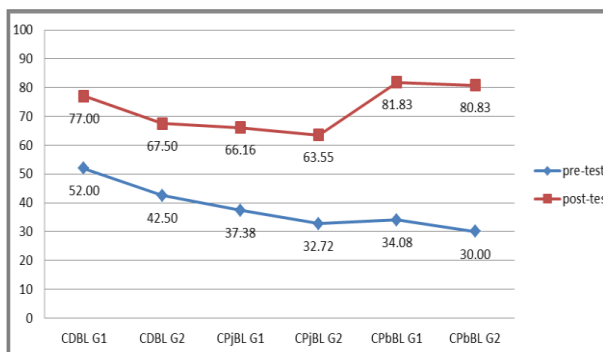
**Table 1:** Scores of Learners’ Knowledge Construction

| Scores of KC | Exp Group 1 |      | Exp Group 2 |      |
|--------------|-------------|------|-------------|------|
|              | $\bar{X}$   | S.D. | $\bar{X}$   | S.D. |
| <b>CDBL</b>  |             |      |             |      |
| Pre-test     | 52.00       | 2.44 | 42.50       | 1.38 |
| Post-test    | 77.00       | 1.33 | 67.50       | 1.58 |
| <b>CPjBL</b> |             |      |             |      |
| Pre-test     | 37.38       | 1.95 | 32.72       | 2.06 |
| Post-test    | 66.16       | 1.75 | 63.55       | 2.08 |
| <b>CPBL</b>  |             |      |             |      |
| Pre-test     | 34.08       | 2.16 | 30.00       | 2.01 |
| Post-test    | 81.83       | 1.40 | 80.83       | 0.94 |

Note:

- KC = Knowledge Construction
- Exp Group 1 = Experimental Group 1
- Exp Group 2 = Experimental Group 2
- CDBL = Collaborative Discussion-Based Learning
- CPjBL = Collaborative Project-Based Learning
- CPBL = Collaborative Problem-Based Learning

Figure 3 Scores of Learners’ Knowledge



Construction of the three modules

In addition, not only the post test scores would be collected, but also the observation and the content analysis of the knowledge construction process retrieved from the pedagogical blended e-Learning and cognitive tools activities also reported in order to see the process of learners developing their construction of knowledge. Such process of knowledge construction development was content analyzed reported in 6 steps along with the detail characteristics of each. The six steps included (1) remembering, (2) understanding, (3) applying, (4) analyzing (5) evaluating, and (6) creation. The details of each module are described in the following sections.

**2.1.1. Module 1 Collaborative Discussion-Based Learning : CDBL**

The mean scores of knowledge creation process of experimental group 1 (synchronous interaction-based cognitive tool) and experimental group 2 (asynchronous interaction-based cognitive tool) were at the average level (61.34% and 52.08% respectively) upon completion of module 1. Though, the scores of both groups showed the improvement of knowledge creation process throughout the module (three week duration) and score of the experimental group 1 was higher than group 2. The detail of each week scores presenting the increasing of knowledge creation scores of both groups are shown in figure 4.

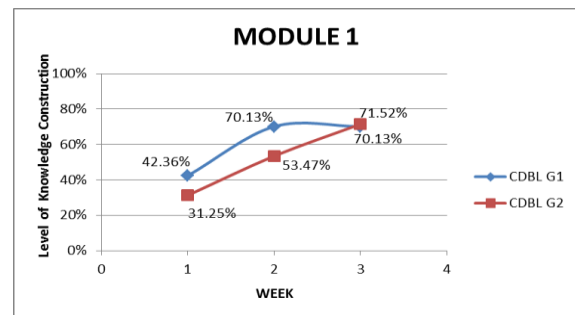


Figure 4 Scores of Learners’ Knowledge Construction process of modules 1

**2.1.2. Module 2 Collaborative Project-Based Learning : CPjBL**

The scores of knowledge creation process of experimental group 1 (synchronous interaction-based cognitive tool) and experimental group 2 (asynchronous interaction-based cognitive tool) were at the average level (67.16% and 66.09% respectively) upon completion of module 2. Though scores of both groups showed the significant improvement of knowledge creation process during the seven-week duration of learning in this model (from 36.11 increasing to 97.91 for both groups) and score of the experimental group 1 was higher than group 2. The detail of each week scores presenting the significant increasing of knowledge creation scores of both groups are shown in figure 5.

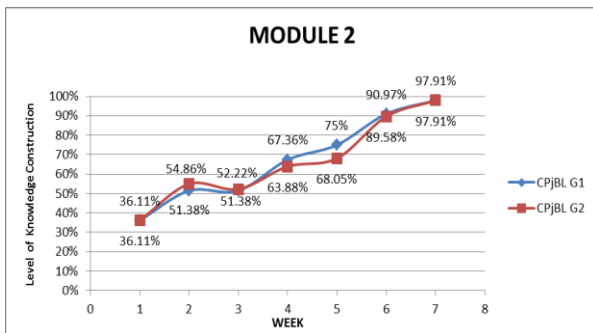


Figure 5 Scores of Learners' Knowledge Construction process of modules 2

**2.1.3. Collaborative Problem-Based Learning : CPBL**

The scores of knowledge creation process of experimental group 1 (synchronous interaction-based cognitive tool) and experimental group 2 (asynchronous interaction-based cognitive tool) were at the average level (81.66% and 78.33% respectively) upon completion of module 3. When comparing among the three models, the scores of both groups in this model showed the most significant improvement of knowledge creation process during the five-week duration of learning (from 55.55 improving to 98.61 for group 1 and from 54.16 improving to 97.22 for group 2) and score of the experimental group 1 was higher than group 2. The detail of each week scores

presenting the most significant increasing of knowledge creation scores of both groups when compared among the three modules are shown in figure 6.

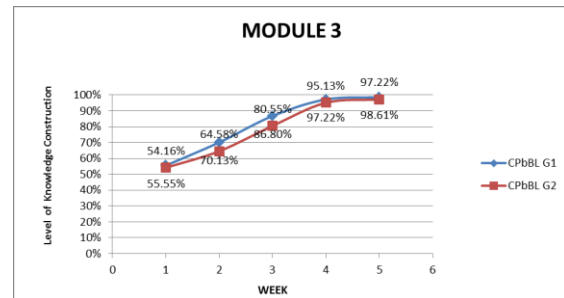


Figure 6 Scores of Learners' Knowledge Construction process of modules 3

**2.2 Learners' Satisfaction towards the model**

Considering result from students' satisfaction towards the model try out, the satisfaction were examined in 2 aspects including 16 questions representing the overall instruction designed based on the proposed model along with lesson plan and 7 questions representing 7 steps of instruction for each module. It was found that learners rated the satisfaction towards overall at the highest level ( $\bar{x}$  = 4.33, S.D. = 0.16 for group 1 and  $\bar{x}$  = 4.54, S.D. = 0.19 for group 2). When considering each module, group 1 rated highest level ( $\bar{x}$  = 4.29, S.D. = 0.21) and group 2 also rated highest level (4.53, S.D. = 0.23) for module 1; group 1 rated highest level ( $\bar{x}$  = 4.35, S.D. = 0.19), as well as group 2 rated highest level ( $\bar{x}$  = 4.66, S.D. = 0.21) for module 2; and group 1 rated highest level ( $\bar{x}$  = 4.33, S.D. = 0.06) and 4.60, S.D. = 0.14) for module 3. The description of 16 items for overall instruction part are as follows: (1) pre-instruction are well plan in preparing learners becoming accustomed to the Learning Management System, (2) Instruction was initiated in learners' challenging manners and summarizing at the end , (3) instructor was well plan during the summarized step and pointed out to the applicable and further use, (4)

the courseware was accessibility, (5) the Learning Management System and the courseware were well equipped according to the learners' need and the course content, (6) the Learning Management System and the courseware were well designed for both text and illustration, (7) the online activity tool was accessibility, (8) the brainstorming activity through online activity tool was appropriate, (9) the assessment through online test was appropriate, (10) the authentic assessment through online observation was appropriate, (11) the authentic assessment through creation of project was appropriate, (12) the course content including group database and course database were accessibility, (13) the brainstorming activity through group database (one type of cognitive tools) was appropriate, (14) the evidence presenting process of group works through cognitive tools (database tool, concept map tool, and presentation tool) were appropriate, (15) the process of group works using cognitive tools (database tool, concept map tool, and presentation tool) were applicable, and (16) the content review through cognitive tools (database tool, concept map tool, and presentation tool) were applicable. The description of each item for the three modules are congruence with the sub models' steps described in phrase 1. The detail scores of 7 steps for experimental group 1 are shown in figure 7, while the detail score of 7 steps for experimental group 2 are shown in figure 8.

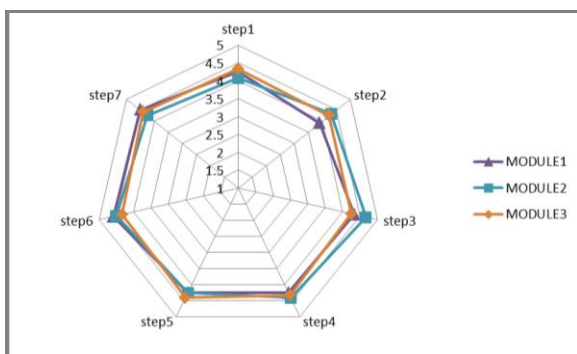


Figure 7: Learners' (experimental group 1) satisfaction towards the Pedagogical Blended E-Learning Model Using

*Synchronous Cognitive Tools*

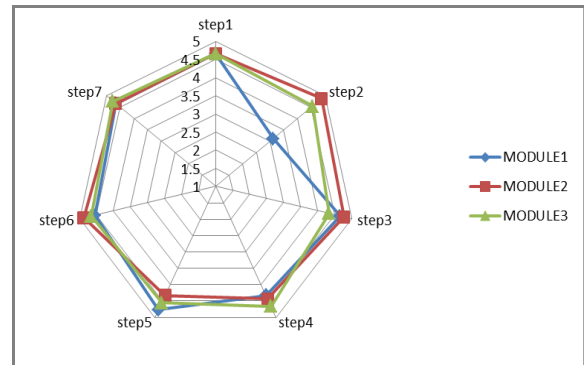


Figure 8: Learners' (experimental group 2) satisfaction towards the Pedagogical Blended E-Learning Model Using Asynchronous Cognitive Tools

**Phase 3 Model revised and confirmation**

The 3 experts considered that the development of pedagogical blended e-Learning model using cognitive tools based upon constructivist approach had the highest level of appropriateness towards the knowledge construction in higher education. The detail of each dimension for consideration included: (1) Model rationale, (2) Model purposes, (3) Model illustration, (4) Model components (Generic Model & Specific Model), (5) Generic model procedures, (6) Specific model procedures, (7) Appropriateness of the model towards knowledge construction in higher education, and (8) Overall of the model is appropriate and applicable. Though, experts had informative suggestions to the study. Some of them, for example, adding details of following up and evaluation stages since these two stages might take a lot of efforts when compared to other stages when teaching in blended learning environment. Accordingly, the role of Teaching Assistant (TA) has played viral role in supporting instructor, especially in the following up stage. Also, the generic model should address the proportion of instruction offering in face-to-face mode, as well as the one offering in online mode which will be more applicable for other instructors who are not in the field of educational technology.

### 3) DISCUSSION AND CONCLUSIONS

Based on the research finding, the top three pedagogical blended e-Learning model included (1) Collaborative Discussion-Based Learning (CDBL), (2) Collaborative Project-Based Learning (CPjBL), and (3) Collaborative Problem-Based Learning (CPBL), while the 6 types of cognitive tools based upon constructivist approach for knowledge construction in higher education comprised of database tool, concept map tool, spreadsheet tool, simulation tool, presentation tool, and conference tool. According to the try out phase of the three models, it was found significant difference at the 0.05 level in pre-test and post-test scores of both groups. However when compared post-test scores of both groups, significant differences were not found. Based on such findings, it can be concluded that all three pedagogical blended e-Learning model are effective. Also, by applying either synchronous or asynchronous interactive-based cognitive tools, it would applicable and interchangeable for all three models. Such statistic finding was strongly congruence with the observation results finding that there was improvement of knowledge construction process consistently. However, when consider the improvement of higher level of knowledge construction, the synchronous cognitive tools presented the higher improvement scores, especially in the area of evaluating and creation. In addition, when compared among the three modules, module 3 (CPBL) showed the highest scores of knowledge creation. Such findings were congruence with numerous literature reviews, for example, the work of Bonk, Kim, and Zeng (2005) discussed about the future directions of blended learning in higher education and workplace learning settings and the proposed three models also were mentioned about its effectiveness and popularity in this handbook. It can also be supported by the article titled Pedagogy-Based Hybrid Learning: from concept to practices

(Khlaisang and Koraneekij, 2009), which mentioned about the effective use of Problem-Based Learning and Project-Based Learning in blended learning environment. The finding also can be supported by the work from De Graaff and Kolmos (2007), Yang, Richardson, French, and Lehman (2011), Alonso, Manrique, and Vines (2009) who studied the effectiveness in managing of change when implementing problem-based and project-based learning in higher education with the constructivist and blended learning environment. The research finding was also congruence with the work of Reeves, Laffey, and Marlino, (1997) and Wang (2004) mentioning about the effective use of cognitive tools in higher education. Further suggestion based on the research findings are addressed that other pedagogical blended e-Learning models should be proposed for the broadly use in other fields of higher education. Also, cognitive tools used in such models should be further examine for the most appropriate tools in constructing cognitive knowledge, especially the higher level of knowledge including analyzing, evaluating, and creation, which are considered the ultimate goals of higher education learning.

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## **Agile Project Management for Smart m-Learning (IEC2012)**

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### **ABSTRACT**

The purpose of this research study is to develop an agile project management model for a management program that involves the information communication and technology (ICT) such as “The Agile Project Management for Smart m-Learning”. Our model is derived from many articles and research documents that we reviewed and synthesized from the discipline of management study; these include: Deming’s management (PDCA), Complex Adaptive System: CAS, PMI project management and three new agile project management techniques: 1) “eXtreme Project Management”, 2) “Agile Project Management: Creating Innovative Products”, and 3) “Project Management e-Learning”. We created and then utilized a set of open-ended questions to generate our model. We used in-depth interviews with two target groups The first target group was five project management experts who have more than 15 years of experience in their career field, the second group was three project management experts in m-Learning from the academia. After the interviews we created our model then went back to the target groups to obtain their acceptance. ehT comments were then used to improve the model which we named “SEED of WISDOM for Agile Project Management”. The author’s plan is to use the model to manage a “Smart m-Learning” project for primary grade students in the future.

### **KEYWORDS**

Plan, Do, Check, Act (PDCA), Project Management Body of Knowledge (PMBOK),

Complex Adaptive System, Agile Project Management, Smart m-Learning

### **1) INTRODUCTION**

The rapid emergence of new Information Communication Technology (ICT) will play a big role in future changes to the education system. The emerging technology use in Thailand has been on an ad-hoc basis. Current planning has not delivered an effective and efficient method to utilize funds and human resources. Installing new ICT to enhance our present education system is difficult because plans usually center on technical aspects but ignore the human aspects (academics, teachers and students); we need to handle the human aspects as well in a project plan. There should be an effective and suitable project management methodology to handle those issues. We need a more flexible way to manage projects that involve fast changing technology. We can’t use traditional project management methodology which is used commonly in construction or industrial fields. For traditional project management (PM), the scope of the project is clear for all participants and technology change does not so much affect the project objective. But in projects where fast changing technology is key, rigid PM that cannot integrate those changes ongoing will hamper getting the desired outcome. We need flexible rather than rigid PM for both objectives and for managing the staff involved in the project. Flexible PM leads to open minds, not just people following management orders, but to think about how to effectively obtain the desired outcomes. The scope and purpose of the project can be changed to meet the changing world as long as the outcome is still aligned with the vision and mission of the organization.



A good example of a rapidly changing technology based project is the attempt to integrate tablet computer based learning in all schools grade 1-12 in Thailand.

The government plan is to implement a much-publicized One Tablet Per Child (OTPC) scheme by distributing nearly one million tablets to all Grade 1 students at the start of the 2012 semester. New tablet models are released about every 2 years and the tablet is only one of many elements in mobile learning environment which is changing fast. The tablet is a powerful “last mile” link in m-Learning system and the m-Learning system itself is changing because of the emergence of the smart mobile environment which includes tablets, mobile phones and 3G or 4G high speed broadband internet. For success with the OTPC project it is not enough to only select a quality tablet and deliver it on time to all students in grades 1-12. The tablet does not teach by itself. We also need to prepare students, teachers, digital content, and school’s internet and wireless environment in order for the tablets to deliver education content effectively and connectivity between students and teachers and online knowledge.

The tablet project, OTPC, is a part of the Smart m-Learning project in which ICT plays a big role in the success of the project. We need an “agile project management” that has much more flexibility to maintain synchronization with the changing smart mobile learning environment.

## **2) RESEARCH OBJECTIVE**

The purpose of the research study is to develop an Agile Project Management model for flexible project management programs so project outcomes can stay aligned with requirements even in rapidly changing environments such as those that involve ICT, for example “The Agile Project Management for Smart m-Learning”.

## **3) RESEARCH HYPOTHESIS**

That “Agile Project Management” can be approved and adapted to rapidly changing ICT environments such as in the “Smart m-Learning” project. The initial research is aimed at proving this hypothesis.

## **4) THEORETICAL FRAMEWORK**

The most popular traditional project management methodology is from the U.S. Project Management Institute (PMI). PMI developed PMBOK which includes their nine bodies of knowledge for project management (PMI, 2004), and which is implemented worldwide. According to PMI project management the project scope is the first item and it must be clear and well planned, in detail, from the beginning. After the scope is settled, a step by step plan is created called a task break down structure (TBS). The TBS is like a waterfall in that it is a one way process; as each step is completed and approved and flows on to the next below, the process does not allow for the project team to go backwards up the steps to determine if changes in the environment will affect the ability to reach the desired outcome or if improvements can be made in prior steps. The process is traditionally one way and will go to the next step one by one the same way as with a waterfall. This style of PM is less effective for projects in which changing technology has the potential to adversely affect the outcome of the project. In these cases, including the “Smart m-Learning” project, the author purposes to use the new model of “Agile Project Management”.

The Agile Project Management model is based on the three foundation principles for PM: 1) the standard code of conduct for all management, plan do check act, PDCA, of Deming circle (Deming, 1955). 2) Complex Adaptive System, CAS (Holland, 1992), which explains how a group of animals such as fish, bees, ants and birds can be grouped again after something interferes with their group shaping, and 3) PMBOK from PMI. These principles were adapted into three Agile Project Management methods: 1) “eXtreme Project Management” (DeCarlo, 2010). DeCarlo describes successfully using this method in software development projects; 2) “Agile Project Management: Creating Innovative Products” (Highsmith, 2010), Highsmith describes implementing new product development project using Agile; 3) “Project Management e-Learning” (Shackelford, 2005). Shackelford implemented an e-learning project using adapted Agile methods.

In year 2001, an expert group in Agile Project Management in the U.S. wrote a declaration of “*Manifesto Agile Software Development*” which developed into an *Agile Project Leadership Network*. Agile Project Management is now also widely implemented in industrial projects.

There are some distinguishing differences and underlying assumptions between traditional and Agile Project Management as follows:

4.1 Traditional PM, strict adherence to the preset methodology:

- Do task break down structure from the planning stage in detail by using existing information plus some forecasted information.
  - The chain of command is clearly tops down hierarchy.
  - Belief that closing control from outside the project team will improve the team performance.
  - Project team members are a part of an effective machine that runs the project.
  - All outcomes in the project are broken down into a series of unchangeable well planned small tasks. The result will be effective if the project team follows the preset plan step by step.
  - Project risk is evaluated from the beginning using all predicted and historical information. All possible corrective and preventive actions for those kinds of risk are set up initially and actions are used if risks materialize in the future.
- 4.2 Agile Project Management (CCPACE, 2011)

Stays flexible on the rapid changing technology yet conforms to customer value.

- The success of a project is aligned with the satisfaction of the client even if the project team must change things during project development.
- Break down is not on tasks and outcomes fixed at the project beginning, but tasks are changed iteratively as needed when client requirements change. Delivery is in small increments.
- Teams work by collaboration both within the team and between interested parties.
- Face to Face open Information communication is emphasized.

- Build the human team not a mechanical team (Agile Organic CAS) and uses simple rules on self control; only light touches are used from outside.
- Need agile vigilance: adaptive leadership not a project controller The author did a literature review on the mentioned principles and synthesized the theoretical framework in figure 1.

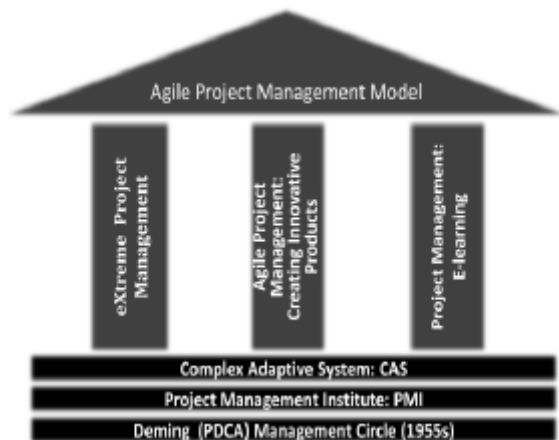


Figure 1: Theoretical framework

## 5) AGILE PROJECT MANAGEMENT MODEL

According to the theoretical framework in topic 4, the author developed the Agile Project Management Model which is shown in figure 2.

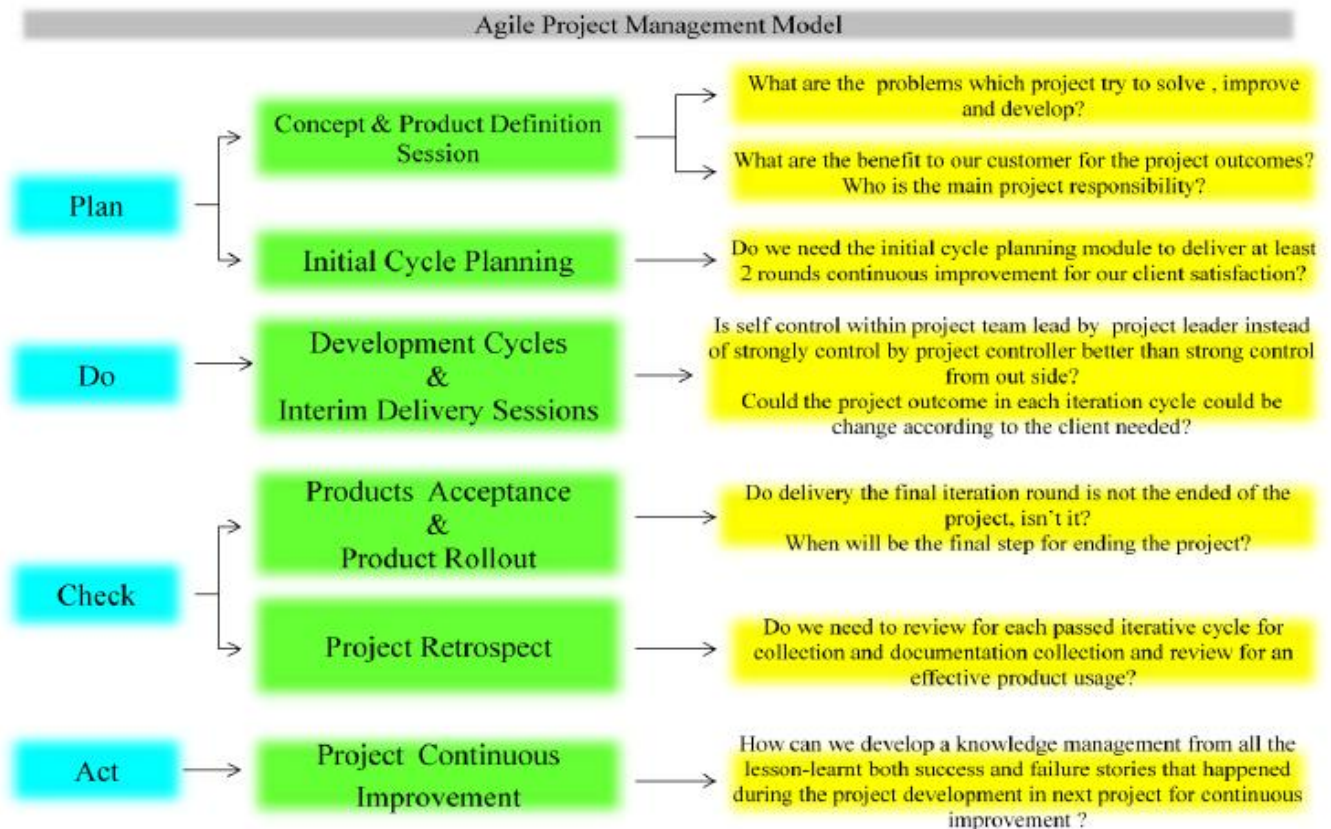


Figure 2 Agile Project Management Model

## 6) RESEARCH METHODOLOGY

6.1 The author developed an opened-ended questionnaire and surveyed 2 groups, then after developing the model went back to the 2 groups and performed in-depth interviews to ensure their approval of the proposed Agile Project Management model. The first group are experts from private sector. While the second group is from government sector.

### Group 1

Five project management experts who each have more than 15 years experience in project management career in the private sector.

### Group 2

Three academics from universities who have at least 10 years of experience in managing m-Learning or e-Learning projects or other technology related projects.

6.2 Collecting and analyzing the interview data as shown in figure 3.

## 7) RESEARCH OUTCOMES

The data for the in-depth interviews is in table 1

### Group 1

Two PM experts agree on the purposed Agile Project Management model and agree it can be applied for smart m- Learning project management. They also expressed the opinion that Agile Project Management could be effectively used in a new product development project. Also they expressed the idea that rapidly changing environments are not only happening in technology but with people as well.

### Group 2

Agile PM is a new methodology in Thai- land, so it's quite difficult to find experts in academia for our in-depth interviews.

In order to compensate for this selection,criteria for PM was changed from morethan 15 years to more than 10 years inmanaging m-Learning or e-Learning projects. As a result we have one m-Learningand one e-Learning PM expert and the thirdperson is involved in other technologyprojects.

| Deming Framework | Main Category                                     | In-depth questions   | Group 1<br>5 experts |   |   |   |   | Group 2<br>3 experts |   |   |
|------------------|---|--|----------------------|---|---|---|---|----------------------|---|---|
|                  |   |  | 1                    | 2 | 3 | 4 | 5 | 1                    | 2 | 3 |
| P (Plan)         | Concept & Product definition Session              | What are the problems which project try to solve , improve and develop?  | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | 😊 | 😊 |
|                  |   | What are the benefit to our customer for the project outcomes?<br>Who is the main project responsibility?  | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | 😊 | 😊 |
|                  | Initial cycle planning                            | Do we need the initial cycle planning module to deliver at least 2 rounds continuous improvement for our client satisfaction?  | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | ✖ | 😊 |
| D (Do)           | Development cycles and interim delivery sessions: | Is self control within project team lead by project leader instead of strongly control by project controller better than strong control from outside?<br>Could the project outcome in each iteration cycle could be change according to the client needed? | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | ✖ | ✖ |
| C (Check)        | Product acceptance, product rollout               | Do delivery the final iteration round is not the ended of the project, isn't it?<br>When will be the final step for ending the project?  | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | ✖ | 😊 |
|                  | Project retrospective                             | Do we need to review for each passed iterative cycle for collection and documentation collection and review for an effective product usage?  | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | 😊 | 😊 |
| A (Act)          | Project continuous improvement                    | How can we develop a knowledge management from all the lesson-learned both success and failure stories that happened during the project development in next project for continuous improvement ?   | 😊                    | 😊 | 😊 | 😊 | 😊 | 😊                    | 😊 | 😊 |

😊→ Agree on the process idea ✖→ Think difference from the process idea

Table 1: The summarized in-depth interview data from 8 experts

The m-Learning expert agrees that applying the Agile PM model to Smart m-Learning is inappropriate and gave us his idea to do a proactive training in Agile PM to the proposed project team and for all interested parties because Agile PM is quite new to Thailand.

The second e-Learning expert also agreed with the applicability of Agile PM to Smart m-Learning, but suggests the author include much more detail in the model to help those unfamiliar with it.

The third expert has more than 15 years involving both non-technology and technology projects. He also agreed on the applicability of the model and also pointed out that human resources are also another fast changing factor, like technology, and in some cases is much more complicated than our expectations. In conclusion, 8 experts agree on the applicability of the Agile Project Management as discussed above and 7 out of 8 experts are already using a project management style which is similar to Agile PM. The only

| Agile Project management (APM) → SEED of WISDOM APM Development |              |  |  |   |
|---|--------------|--|--|---|
| Deming Framework  |              | Main Procedure                                   |  | Sub Procedure   |
| Original  | Synthesize   | Original   | Synthesize   |   |
| P (Plan)  | S (scheme)   | Concept & Product definition Session             | <b>W</b> hat are Project Concept & Definition?                                 | What are the problems which project try to solve , improve and develop?<br>What are the benefit to our customer for the project outcomes? Who is the main project responsibility?   |
|   |              | Initial Cycle planning                           | <b>I</b> terative cycle Planning   | Do we need the initial cycle planning module to deliver at least 2 rounds continuous improvement for our client satisfaction?   |
| D (Do)  | E (execute)  | Development Cycles and interim delivery sessions | <b>S</b> elf Doing Activity by Simple Rule Control through the Iterative Cycle | Is self control within project team lead by project leader instead of strongly control by project controller better than strong control from out side?<br>Could the project outcome in each iteration cycle could be change according to the client needed? |
| C (Check)   | E (evaluate) | Product Acceptance Product rollout               | <b>D</b> elivery Final Products for Acceptance & Rollout Project               | Do delivery the final iteration round is not the ended of the project, isn't it?<br>When will be the final step for ending the project?   |
|   |              | Project Retrospective                            | <b>O</b> perate Retrospective  | Do we need to review for each passed Iterative cycle for collection and documentation collection and review for an effective product usage?   |
| A (Act)   | D (develop)  | Project continuous improvement                   | <b>M</b> anage Guide Line for Continuous Improvement                           | How can we develop a knowledge management from all the lesson-learnt both success and failure stories that happened during the project development in next project for continuous improvement ?   |

Figure 4 : SEED of WISDOM Agile Project Management

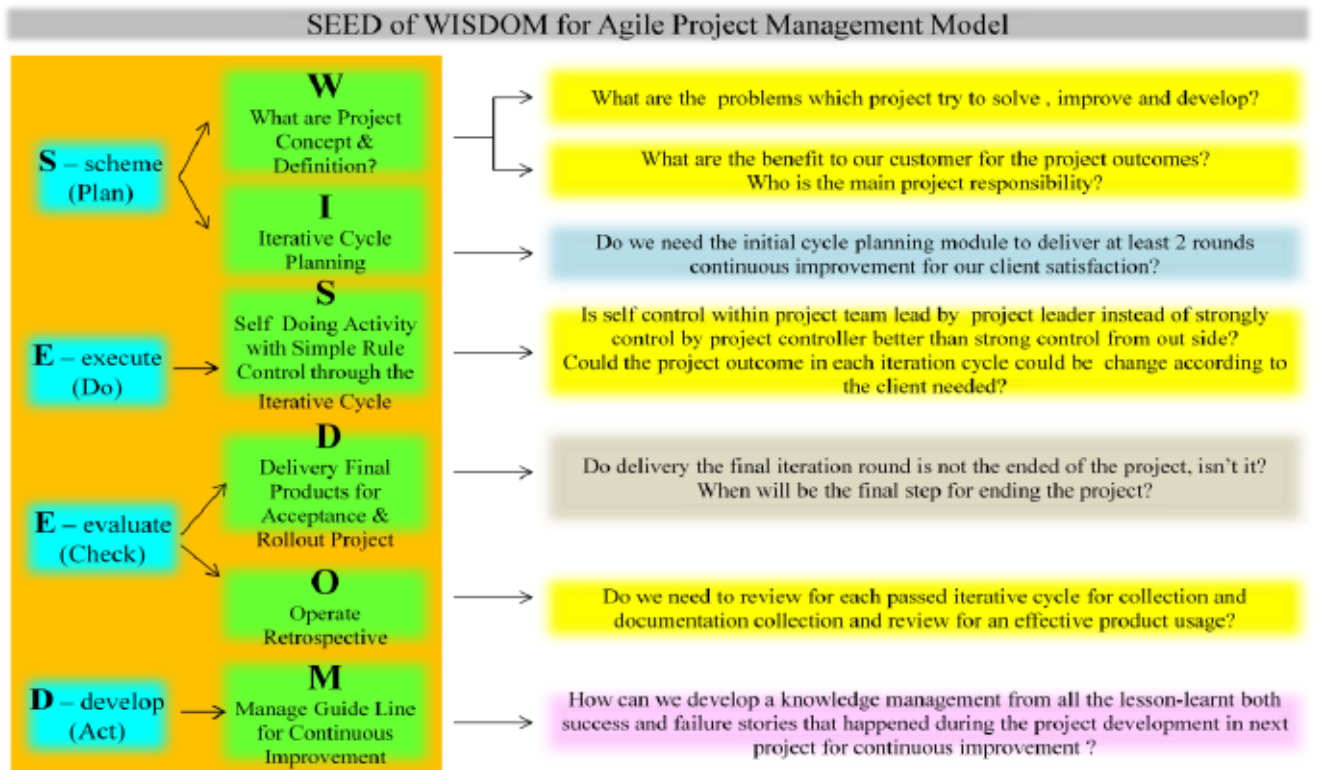


Figure 5 : SEED of WISDOM for Agile Project Management

raised was that it might be difficult to implement Agile PM for large government projects because the bureaucratic system in the government sector may be reluctant to adopt this new system. The author reviews the information from the in-depth interview and synthesizes the “SEED of WISDOM for Agile Project Management” in figures 4. Figure 5 is the final “SEED of WISDOM for Agile Project Management Model” which is approved by the experts.

## 8) SUGGESTIONS FROM THE RESEARCH

the in-depth interview results agreed that the “SEED of WISDOM model” could be appropriately applied to m-Learning, but two obstacles may block the effectiveness of an Agile PM of the project. These are:

1) cultural issues may keep the ideal of individuals supervising themselves (i.e. personal responsibility) from functioning well, and;

2) the bureaucratic system of the government sector may make it difficult to change to an Agile PM like system of project management in a large government project. It is common in government projects to close a project that meets all the items in the Terms of Reference (TOR) or specification and pass inspection, yet the final out-come will go unused because it is already obsolete.

In conclusion, Agile Project Management is a good and applicable project management tool for private sector technology projects and medium and small government projects where rapidly changing technology is an issue. The author plans to add to this re-search during an implementation of the “SEED of WISDOM Agile Project Management for Smart m-Learning: A Case Study in Primary School Students” within this fiscal year.

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## Development of On-line Instruction Media an Administration System based on Moodle Program on Learning Behaviors of PhD. Students

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### ABSTRACT

Moodle program is a system for which educators can create learning protocol such as learning document, multimedia, assignment, whereas the learning management system (LMS) which is a software application for which learners can interact online courses engaging learners in discussing course materials, to foster a sense of community, and to enhance learning. The purposes of this research were: 1) to develop of on-line instruction media and an administration system based on Moodle program, 2) to create instruction media on TTPM7313: Qualitative Research Design course, and 3) to evaluate satisfactions and attitudes of learners toward on-line instruction media. The populations comprised PhD students registered in Qualitative Research Design course in the second semester of the Academic Year 2011, Christian University. Lesson plans, web-based instructional materials and web blogs were used on Moodle in this research. Content analysis on qualitative work was done to determine trends and major themes. The results revealed that web-based instructional materials on Moodle program encourage learners to focus on their lessons more frequently and also promoted the learners' eagerness, responsibilities and access to knowledge outside the classroom. Moodle program improved their computer-assisted learning skills as well as knowledge transfer in higher education. The acceptance of web-based instruction was influenced by the learners' access to online instructional materials, their personalities and the instructor's teaching performance.

In conclusion, Moodle program is a useful tool for developing on-line educational system. It also meets the requirement of educators, and learners who relate to this system. The results show that learners rated their learning at the great level and satisfaction of Moodle program at the highest level.

**Keywords:** Learning behaviors, Learning Management System (LMS), Moodle program, PhD student.

### 1) INTRODUCTION

Technology and computers have affected teaching and learning in Thai higher education. The multi-function of Learning Management System (LMS) such as Moodle is integrated in classrooms to enhance students' learning who struggle with conventional pedagogical methods. Moodle moves the instructional model from an instructor-centered presentation to a student-centered learning model (Moodle,2012). The instructors act as facilitators of learning, assisting and engaging students in group discussions. Moodle makes the courses more interactive, inclusive and student centered (Dougiamas,M2004). It is important to see how Moodle would affect and/or improve the motivation, participation, and learning outcomes. This research involved the actual implementation of Moodle using by PhD student. The problems in the implementation have been noted and recommendations compiled to aid others in their implementations. The purposes of this research were: 1) to develop of on-line instruction media and an administration

system based on Moodle program, 2) to create instruction media on TTPM7313:Qualitative Research Design course, and 3) to evaluate satisfactions and attitudes of learners toward on-line instruction media.

## **2) LITERATURE REVIEW**

Learning Management System (LMS.) was a software package, usually on a large scale, that enables the management and delivery of learning content and resources to students. At a minimum, the LMS sometimes referred to as a Course Management System (CMS) or Virtual Learning Environment (VLE) usually allows for student registration, the delivery and tracking of e-Learning courses and content, and testing, and may also allow for the management of instructor-led training classes (Melton,J. 2006). Web-based tools, common in such systems, include email, content forums, chat groups, resource page templates, grade books, and interactive quiz applications. It is designed to facilitate teachers in the management of educational courses for their students, especially by helping teachers and learners with course administration. According to Taylor and Maor (2000) the constructivist on-line learning environment consists of six major components: relevance, reflection, interactivity, tutor support, peer support and interpretation. Dougiamas (2011) explained that his Moodle were in line with Taylor and Maor ideas, Dougiamas developed Moodle with emphasized on elements of the students' environment that were focus on the web site as a tool for navigating the course, web site content, activities and resources, the online tutor's participant and support, and the students' participation and support.

Moodle is an online learning system, virtual learning environment or course management system. It is a highly developed open-source teaching support system. The word Moodle was originally an acronym for Modular Object-Oriented Dynamic Learning Environment, which is

mostly useful to programmers and education theorists, which accurately sums it up in an easy-to-grasp catch-phrase. Moodle consists of different learning activities such as lesson, journal, wiki, forum, chat, and quiz. Moodle's design is grounded in a socio-constructivist theory of learning (Zsolt, T., and István, B. 2008). Learning task can be designed to allow for cooperation between the lecturer and students or among students by using different formats of social interaction. Students interact with each other synchronously in a chat room, engage in asynchronous discussion in Wikis and forums. Moodle enables students to compose or work together on a text while online (Dougiamas, 2011). Moodle is very useful in a university setting , however it is also useful in any place corporate or academic, that seeks to deliver some sort of curriculum to either its staff or customers. Moodle is learning environment from the standpoint of several theories (i.e. learning spaces, environmental psychology, learning styles, multiple intelligences, etc.). Moodle is a teaching/learning supportive environment. Our concern is that there seems to be a lot of people choosing Moodle as e-learning platform, and although there is huge enthusiasm and some apparent success in its introduction into educational settings; the amount of formal research to assess this environment and its tools (both from technical and didactical standpoints) is not much, so that still little that can be said about its impact on learning outcomes.

## **3) METHODOLOGY**

### **3.1 Population**

The population of this study included the first year graduate students in PhD program. They were 13 PhD students in all disciplines of Administration Science (7 nursing administration,1 public and private administration, 1 educational administration and 3 hospital administration). They all were part time students.



### 3.2.Methods

Quantitative approaches were employed in this study. In depth interview was used for qualitative data collecting. According to the course requirement, the graduate students had to enroll in TPPM7313: Qualitative Research Methods course. This course was two credits with two hours of lectures as well as three hours of self study per week. The e-Learning activities started at the beginning of the course to 15 weeks during the second semester 2011.

The Internet learning module (<http://ctulms.christian.ac.th>) is located at the e-Learning web site of Christian University: CTU Computer Center. Moodle version 1.9.11 was used to manage the e-Learning activities. The web-based learning content was developed based on the course description, behavior objectives, teaching unit, teaching and learning activity. The contents of the e-Learning modules focused on 1) Classification of management theory and qualitative research apply in management and administration discipline, 2) identification of philosophical based of qualitative research, 3) Qualitative approach, 4) Selection and applying an appropriate method(s) for data collection best suited for qualitative research, 5) Data management and data analysis process/content analysis, and 6) Writing qualitative research report. Other activities on the website comprised links to references and online resources, a web board, email contacts, and video clips.

At the end of each session, participants were asked what they thought about the learning experience. The e-Learning interview topics included the usability; content and design; overall knowledge gained and program impact on the students' learning behavior. Content analysis was used to assess the students' opinions anonymously on both the e-Learning modules and the overall course.

### 4. RESULTS

In this innovative course, thirteen students logged into the e-Learning Moodles. The results showed that all of participants (100%) frequently access (more than once a week) the e-Learning website, journals, content resources, assignment exercise and scheduler were the most popular tool. Data from interviewing was shown in 4 themes.

1) Navigation and Usability: Most of participants said web site was easy to read , access and navigate through the CTU e-Learning link .Online resources and menus were available and easily accessible except the server had some problems. Forgetting the password was a big problem in two female students. In addition, all of the students had experience with Windows systems. They had previous experience with word processing, spreadsheet, browser, presentation, and digital photo software. All remarked they thought computers were useful and used them for their research, eight used them during free time, and all noted that they were okay with computers. None had used Moodle before. All participants had experience with computers, but that experience was varied and might have been limited to several specific tasks related to their skill. Students can learn everywhere and every time they like and revisit the course as often as they like, if they don't understand.

2) Content and Design: The course content was organized in a way that allowed the participant to meet the learning objectives. The course content was up-to-date and helpful real-life examples or applications. The e-Learning modules helped their understanding of the course and retrieved the educational media easily. It saves cost in a long term, for example, no need to print so much paper sheets. There was borderless for everyone who want to take the course. It was a good idea if the participant can also use examination module on this online learning for the final examination in the class room. This is good if their teacher provide the classes for working people who are not able to join

the weekday normal classes. The student can do it around the world. The Moodle "Assignment" tool with advanced uploading of files was used for deliverable for the course, with each "assignment" placed where it was due. This provides an easy to understand schedule of what is required. Also a "weekly report" was added for each week, as an assignment.

3) Program Impact: Moodle approach as worked reasonably well. It should provide more effective where there are a large number of students using the system with individual supervisors, with the lecturer in charge being able to monitor progress. The participant will be able to apply the knowledge and/or skills gained from this course and help them to improve their understanding. Overall, the participants were satisfied with this course and enjoy this type of learning. They would use this type of learning again and would recommend this course to other students. The participant liked the form of blended learning as applied in the course. Some pointed out that they could easily arrange work duty with learning, or that they could repeat online lessons as often as they wanted, or until they understood. The participant suggested that teachers may need to put extra effort in developing their course at the beginning and will cost you extra more to get some media content like sound recording and video. Students must have strong self-discipline in taking courses. Lack of face to face interaction among teachers & classmate, so they must go together with normal class at least once a week they all meet together to recapture everything done during the week.

4) Knowledge Gain: Prior to completing this course, their level of knowledge/skills about qualitative research was little. After completing this course, their level of knowledge/skills about qualitative research is better. Overall, the participants were highly satisfied with the course.

## **DISCUSSION**

The PhD students were all part time students. The students comprised of adult learners with diverse abilities, learning styles, schedules, and geographic locations. That's why Moodle was fit to this group. Students may communicate with their instructors and each other in learning communities, access learning material, take quizzes, and submit assignments, all using the power of the Internet (Ko & Rossen 2004, Preece, 2000). It provides more space to Thai students in the discussion board as they don't like to ask questions in class. Moreover the Q&A among teachers and learners are captured in Moodle.

Moodle is a teaching/learning supportive environment. Our concern is that there seems to be a lot of people choosing Moodle as e-Learning platform, and although there is huge enthusiasm and some apparent success in its introduction into educational settings. An essential point to make here is that all users of online tools should be comfortable using the tools. Teachers lacking the skills should get them, through training or through close consultation with colleagues who know how to use them. At the same time we should make sure our students are comfortable with them as well. We should take the time to show them essential features, one at a time. Teaching and learning the skills may take several class meetings, but command of the tools is the key. Students have been motivated to use Moodle and get the same results by: 1) creating greater student participation and 2) assisting the students to take ownership of their learning both online and in class.

## **CONCLUSION**

On-line Instruction Media and Administration System based on Moodle Program have generated positive learning attitudes and engagement by the students. Using the new e-Learning pedagogy, the students who experience some anxiety from setbacks experienced in class, may

benefit from the new experience of directing their own learning. Using Moodle should generate more positive experiences for the students, and a greater willingness to try new things, and learn more efficiently and effectively. This research demonstrated what the students' behavior change about individual help, group assistance, self-directed learner, technological and computer skill and participation. The recommendations emphasize the integration of pedagogical strategies and technical tools in online education as the hybrid digital class in order to meet the diverse abilities, experiences, and needs of online learners more efficiently.

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## The INFINITY Learning Model in Thailand: Its Potential for Developing Countries

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### ABSTRACT

Online learning models are acknowledged to be key delivery systems in higher education because of their potential for lifelong learning initiatives. The main objective of this article is to present such a learning model, namely INFINITY, through a research project to investigate its effectiveness to utilize the potential of the Internet for the contemporary university classroom in developing countries with graduate students at two selected universities in Thailand. The learning model was developed to enhance the Internet literacy of students, one of the most crucial skills for the 21<sup>st</sup> century. The INFINITY learning model consists of eight steps: (1) I-Investigate Internet resources, (2) N-Navigate learning objectives, (3) F-Find focus and keywords, (4) I-Inquire about the reliability of resources, (5) N-Network information, (6) I-Illustrate and define the knowledge base and its functionality, (7) T-Transform into practice and (8) Y-Yearn for feedback and refinement. The exit survey found that the opinions of participants who had been learning via the INFINITY learning model were very positive with students acquiring different skills and various aspects of knowledge. Use of the INFINITY model added value to the educational process since it encouraged teenage and adult students to access updated information and was a very useful pattern of learning through an individual and collaborative learning process.

**Keywords** e-Learning, e-Learning method, Internet-based learning model, learning model, systematic approach

### 1) INTRODUCTION

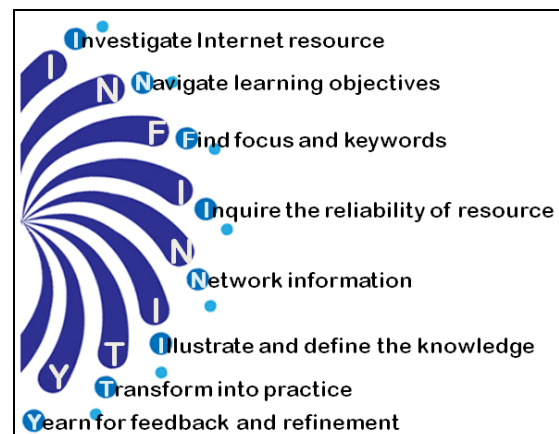


Figure 1: INFINITY Model

The INFINITY learning model (Figure 1) is based on the sequential steps of a learning approach to direct graduate students to investigate Internet resources for academic purposes. The model is the output of a research study which aimed to increase the effectiveness and efficiency of the usage of resources on the Internet for academic purposes and decrease errors and time spent on gathering online information. Despite the fact that the Internet is the most up-to-date and largest teaching and learning resource in the world, Thai graduate students have faced obstacles when searching for information on the Internet such as lacking the know-how to use search engines for academic purposes, misunderstanding of resources presented in other languages and the demanding skills to filter, manage and file information. The INFINITY model is a sustainable learning method since it was designed based upon a user-centred model. Moreover, this

learning model supports lifelong learning from student-hood into adulthood. It encourages users to organize their objectives to suit their learning paths and individual pace. The key feature of the INFINITY model is a combination of the most updated information on the Internet and today's classroom environment. This research paper will describe the eight steps of using the INFINITY learning model and the research results which reflect the strength of this blended learning model.

## 2) LITERATURE REVIEW

The potential of the Internet enhances the format of human communication, especially the social network which is becoming a central part of today's society (Hart, 2009). Online learning or e-Learning has been nominated as a necessity for contemporary and future education. The most important concern is how to connect Internet technology with the traditional classroom because an Internet-based learning model is able to bridge useful online information and applications to a traditional classroom. Online learning models are in high demand; however it seems they still lack a systematic approach to learning. In practice, online resources influence the way people communicate, learn and interact with media. The Internet will definitely play the important role in education, according to a comprehensive report of educational projects in USA, which shows that by 2019, approximately half of all high school courses will be delivered online (Horn & Staker, 2011).

The early stages of Internet-based learning have been started as a combination of learning models of the traditional classroom and an online mode. The positive outcome of Internet-based learning presents a better alternative for learning because it is a 'new normal' by which students can control time, place,

path and pace (Horn & Staker, 2011). Additionally, learning through the Internet is an important element of instruction where "school" has to initially commit more financial resources regarding infrastructure but less over the long term of school development. A learning model which integrates the Internet will play a vital role since its productivity delivers markedly better results in the student learning environment at the same or even lower cost.

The INFINITY model is the integration of Internet technology and a traditional learning environment as blended learning model (Upside Learning, 2010). The INFINITY model has been designed to fit into the future of education based upon the eLearning approach. It has been influenced by the success-based design of Allen (2007). The success-based design is a systematic approach which was derived from theories, research, and experience. The objective of success-based design is to provide 1) a useful structure, 2) handy clarity, 3) practical guidance, and 4) evidence of broad based support and recommendations. Thus, the success-based design is built around the notion that the principle for design instruction to be **4Ms**: a **meaningful**, **memorable**, and **motivational** learning experience for students and be a **measurable** activity. The components of instructional interactivity are the fabulous four comprised of context, challenge, activity and feedback. Instructional interactivity means "Interaction that actively stimulates the learner's mind to do those things that improve ability and readiness to perform effectively" (Allen, 2003, p. 255, as cited in Allen (2007), p. 128).

Firstly, a meaningful learning activity is designed to ensure that learning events are related to the current situation that learners expect to encounter or to a compelling interest story that builds on a developed context and allows learners to select tasks

of importance and relevance. Secondly, a memorable learning activity enables learners to achieve the learning objectives at the end of the instruction. The output of success-based design is not only achieved “doing well” during the course of instruction, but also heightens the impact of what the students have learned. Thirdly, a motivational learning activity which is an essential factor results in changing behaviour. The high motivation interactivity is crucial to increase students’ demand to obtain guidance and practice. Fourthly, measurable activity refers to the strategy to evaluate the improved learning performance as an authentic capacity which has been effectively increased through the training.

The underpinning of the INFINITY model was based upon the fact that knowledge is constructed rather than being “found out there”. It is not a one-size-fit-all model. This learning model is suited to content-based subjects, not drill-and-practice subjects. Trial in this research study for the adult education context, it is designed particularly to fit into the higher education context, and is recommended for learners who have good skills for analysing online data.

### **3) STATEMENT OF PROBLEMS**

The INFINITY model is, in this instance, a classroom research tool which aims to solve problems of graduates who face difficulties in completing a literature review section of their dissertation. The details of both the problems and solutions at each step of the model are as follows:

#### **3.1) Investigate Internet resources**

The frequent fact, certainly in Thailand, is that libraries and resource centres are distant, mostly located in Bangkok while many students are located all around the provincial cities and towns of Thailand. Even for students who live in Bangkok

Metropolitan, the major problem is the heavy traffic and full-time workers who are studying cannot take leave from work very often. Internet availability in Thailand varies from Fiber to the Home (FTTH), 3G and Asymmetric Digital Subscriber Line (ADSL) which means the Internet is fully available across the country. The issue at this stage is to provide Internet accessibility in the classroom since not all classrooms in Thailand encourage students to use computer devices and go online while studying.

#### **3.2) Navigate learning objectives**

The information on today’s Internet is very broad-ranging. People have not enough time to explore and read everything. One of the main problems is that people spend endless time on other online activities. The action point of navigation of this stage is to specify the precise information that is needed and how many articles or sources need to be gathered. In some cases, it is necessary to determine the range of years of information. At this stage the instructor should work together with students to establish the appropriate topics of literature review and all the precise objectives.

#### **3.3) Find focus and keywords**

The problems are that students neither do not know how the search engine functions nor know what to search for, nor the web databases for academic resources. The action point of this finding stage is that students be encouraged to identify keyword(s) to search using different languages rather than just Thai and using various synonyms both in Thai and English. The graduates have been introduced to use web 2.0-3.0 applications which can assist their study such as Delicious, Google advanced search, Google scholar, Slideshare, ISSUU, youtube education and so on. The instructor also needs to emphasise that knowledge can be derived from different types of media such as videos, movies, audio, images and presentation.

**3.4) Inquire about the reliability of resources**

Students need to inquire about the reliability and quality of online resources from the gathered information. The instructor needs to guide the students to evaluate and investigate online information in terms of quality of resources, for example. The action point of this inquiring stage is to check and compare the reliability of available information from different resources.

**3.5) Network information**

A house cannot be built without a plan, thus a report cannot be completed without an outline. The structure of any report is an important backbone which needs to be designed to be congruent with the objectives that are set at an initial stage of the project. In order to create a report, students need to gather knowledge and then they will practice to draft the outline of the report. Students will decide which information needs to be cut and which parts need to be kept. The action point of this stage is to arrange sequence and organize all gathered data.

**3.6) Illustrate the knowledge base and its functionality**

To check the flow of the information and prevent duplication, students are recommended to analyse the gathered information. The document will be framed by the proposed objectives. The action point of this stage is to crystallize and summarize information to form their own knowledge. Students illustrate and define the knowledge base and its functionality or context and practical application.

**3.7) Transform into practice**

The result of all previous tasks will be transformed into being a report. This is to guarantee that students will organize at least one document meaningfully and to accelerate productivity. This is also to prevent reports being unfinished as might

happen because the student is overwhelmed by the information gained from the Internet. The students will be assigned this action task in order to provide proof of understanding and competency regarding the gathered knowledge.

**3.8) Yearn for feedback and refinement**

Feedback and collaboration between students and instructor will generate productivity. In practice, the literature review part of the dissertation can be a huge document so when the process is long, the task should be organized into small units or achievable chunks. The approach of INFINITY reduces the isolation that might occur while surfing for information via the Internet but encourages students to work closely with their advisors. Students wish to have detailed feedback to evaluate their understanding and guide them to the next step. Instructors should provide various criteria to measure the level of students' comprehension.

Hence, the word INFINITY comes from the initial letter of the eight actions to solve difficulties completing documentary research. The INFINITY learning model consists of eight steps (Figure 1). The INFINITY model has been analysed against the success-based design 4M principles: meaningful, memorable, and motivational to students and be a measurable activity as shown in Table 1.

Table 1: INFINITY Model and 4Ms

|                     | I | N | F | I | N | I | T | Y |
|---------------------|---|---|---|---|---|---|---|---|
| <b>Meaningful</b>   | ⊙ |   | ⊙ |   |   | ⊙ |   | ⊙ |
| <b>Memorable</b>    |   |   |   | ⊙ | ⊙ | ⊙ | ⊙ |   |
| <b>Motivational</b> | ⊙ |   |   |   |   |   |   | ⊙ |
| <b>Measurable</b>   |   | ⊙ |   |   |   |   |   | ⊙ |

Referring to Table 1, the 4Ms have been designed into each separate step of the INFINITY model. The meaningful learning experience occurred in the steps of: I-Investigate Internet resources, F-Find focus and keywords, I-Illustrate and define the knowledge and Y-Yearn for feedback

and refinement. The memorable learning experience occurred in the steps of: I-Inquire about the reliability of resources, N-Network information, I-Illustrate and define the knowledge and T-Transform into practice. The motivational learning experience occurred in the steps of: I-Investigate Internet resources and Y-Yearn for feedback and refinement. Lastly, the measurable activity occurred in the steps of: N-Navigate learning objectives and Y-Yearn for feedback and refinement. The INFINITY model has been trialled, providing both quantitative data via an online questionnaire and qualitative data via responses to an open-ended questionnaire as described in the next section.

#### 4) RESEARCH METHODOLOGY

The INFINITY learning model has been trialled in a quasi experimental research environment with three classes of doctoral degree students from two selected universities in Thailand. The first classroom comprised graduates of the doctoral degree in Educational Technology and Communications from *Chandrasakem Rajabhat University*. The other two classes were graduates of the doctoral degree in Educational Administration from *Buriram Rajabhat University*. The participants were students from three classes, 4, 12 and 15 students respectively. In total, there were 31 doctoral degree students who participated in this research.

The stages of this research were 1) Review the literature, 2) Design a draft model, 3) Trial in the real classroom as follows:

3.1 Students had been introduced to and demonstrated as to what INFINITY is. Instructor has demonstrated how to work on each step by providing examples and guiding students to many Internet resources.

3.2 Internet was determined as the major channel for two assignments.

3.3 the topic of the first assignment was 'gathering Thai information' based on topics of the each student's dissertation regarding research, case study, knowledge, theory and so on. The topic of the second assignment was the same but in English or other languages.

3.4 After students have completed their reports, the last step is to send their work to the instructor in their yearning for feedback.

3.5 Instructor checked the reports in terms of the completion and comprehension of each step.

3.6 The feedback included an evaluation from 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent. Moreover, the instructor advised on how to improve the report.

And 4) After the completion of two assignments based on the INFINITY model, all students have been given an online questionnaire inquiring about their opinion of the eight steps of INFINITY.

The questionnaire consisted of two parts: A) demographic information and B) opinion of the INFINITY model. The two items of demographic information were gender and age of participants. There were eight five-scale-rating items (1-5) and two multiple-choice-questions and the last question was an open-ended question. The content of all questions regarding the INFINITY model were as follows:

1. It is able to build competency.
2. It is able to build new knowledge.
3. It is a meaningful learning experience.
4. It is a memorable learning experience.
5. It is a motivational learning experience.
6. It is a measurable activity.
7. It invents an obstacle to study.
8. I will apply INFINITY model to my future assignments.
9. What is the most preferred step?
10. What is the least preferred step?
11. Any suggestion about the INFINITY model.



## 5) DATA ANALYSIS AND RESULTS

Close to eight out of ten students (77.4% or 24 students from 31 participants) completed the online questionnaire. The participants were female (54%) and male (46%). The average age of participants was about 40 years old. Crucially, this set of items included one negative question to check participants' attentiveness.

Table 2: Satisfaction with the INFINITY Model

| Question | Average | SD.  | Meaning        |
|----------|---------|------|----------------|
| Q1       | 4.58    | 0.50 | Strongly agree |
| Q2       | 4.67    | 0.56 | Strongly agree |
| Q3       | 4.54    | 0.51 | Strongly agree |
| Q4       | 4.63    | 0.58 | Strongly agree |
| Q5       | 4.58    | 0.58 | Strongly agree |
| Q6       | 4.50    | 0.59 | Strongly agree |
| Q7       | 2.54    | 1.44 | Disagree       |
| Q8       | 4.75    | 0.53 | Strongly agree |

Table 2 shows the average scores of the five-point items, standard deviations and meanings of each item (N=24). In appraising the results, the usage of the INFINITY model was higher than 4.5 out of 5 on the Likert scale reflecting the positive attitudes of the participants. The findings comparing the two gender groups and the three university classes using an independent-samples t-test and One-way ANOVA found that each variance was equal assumed and the appraisals by the two gender groups and the three classes were not significantly different. Moreover, based upon the other two multiple-choice questions, the most favourite step was 'Transfer knowledge to practice' whereas the least favourite step was 'Inquire about the reliability of resources' - this might be because it takes time to search for and compare similar knowledge from the various available resources. The opinions expressed in response to the open-ended question were very positive such as "I learnt a lot because the model guided me and encourage me to involve in all steps respectively. It is a great approach to learn since students are enlightened by practice-oriented. I discovered knowledge at my own pace".

## 6) SUMMARY, DISCUSSION AND RECOMMENDATIONS

The Internet is one of the crucial instruments to accelerate productivity of instruction in 21<sup>st</sup> century. The results of this classroom research reflect positive outcomes of a systematic online learning approach namely, the INFINITY model. Thailand and other developing countries should consider many more classroom research studies focused on integrated Internet technology since it improves opportunities to access the most up-to-date online resources and overcoming the distance barrier. The clear guidelines and steps of this learning model assist adult learners to complete assignments within a shorter time and produce better quality reports. The INFINITY model was created under a new paradigm which emphasizes the 4Ms in order to design an eLearning environment that is a meaningful, memorable and motivational learning experience for students and a measurable activity. The eight steps of the INFINITY learning model expand the collaboration between students and instructors. This learning model will be one of the sustainable learning methods that formulate the lifelong learning model into the future.

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## **Effect of e-Learning Using Collaborative Learning via Social Media on Competency of Using Information and Communication Technology of Undergraduate Educational Students**

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### **ABSTRACT**

**The purposes of this research were 1) to compare learning achievement of students on the course of Introduction to Educational Media between pretest and posttest. 2) to study competency of using information and communication technology of students. 3) to study the opinions of students towards e-Learning using collaborative learning via social media. The sample consisted of 180 the second-year undergraduate students in Faculty of Education, Silpakorn University, in the second semester of academic year 2011 by purposive sampling. The instruments of this research were 1) 8 lesson plans. 2) learning management system using collaborative learning via social media. 3) competency of using information and communication technology test. 4) behavior observation form of using information and communication technology. 5) the learning achievement test. 6) instructional media product evaluation form. 7) wiki contributions evaluation form. 8) questionnaire on students' opinions. The collected data were analyzed by mean, standard deviation and t-test dependent. The results of the research were as follows: 1) learning achievement of students, posttest was higher than pretest at 0.01 level of significance. 2) Competency of using information and communication technology of students was high level. 3) The opinion of students towards e-Learning using collaborative learning via social media was good positive level.**

### **Keywords**

e-Learning, Collaborative Learning, Social Media, Competency of using information and communication technology.

### **1) INTRODUCTION**

In the new information age and knowledge-based society, Digital information technologies are rapidly transforming traditional ways of living, working and learning. It would appear obvious that students need to be prepared for the challenges and possibilities posed by these dynamic technologies (Miliszewska, 2008: 103). Thus, to live, work and learn successfully in today's world, students must utilize technology effectively, technology can enable students to become: capable information technology users, information seekers, analyzers, and evaluators, creative and effective users of productivity tools, communicator, collaborators, publishers, and producers etc. (UNESCO, 2008: 1). So, competency of using information and communication technology and collaboration are more important for students these days and in the near future. In addition, 21<sup>st</sup> century learning environment in today's interconnected and technology-driven world, a learning environment can be virtual, online, remote, in other words, it doesn't have to be a place at all (Partnership for 21<sup>st</sup> Century skill, 2011: 3). e-Learning therefore becomes unquestionably the major mission critical in education systems and offers new opportunities for students to enrich their learning experiences through virtual environment that support not just delivery, but also the exploration and application of

information and new knowledge (Holmes and Gardner, 2006 : 1, 10) Moreover, it is impossible to ignore the influence of social media nowadays and it's a vital part of the communication process (Gerlich, Browning, & Westermann, 2010: 35). In addition, social media was used and/or applied in education to support students learning. Mayfield (2008: 5) defines, Social media is best understood as a group of new kinds of online media, which share most or all of the following characteristics: participation, openness, conversation, community, and connectedness. So, a interesting basically kind of social media is wikis. A wiki is a collaborative Webspaces where anyone can add and edit content (Richardson, 2009: 9), wikispaces owned by San Francisco-based Tangient, this wiki farm provides a free and easy way to create public wikis. It offers wiki creators unlimited pages, a WYSIWYG editor, .zip backups, RSS feeds, tags, and editable left navigation bar. Users can embed photos, audio, or video into their wikispaces (Kroski, E., 2008: 50). Thus, collaborative learning was used in the research, Hiltz and Wellman (1997, cited by Trentin, 2010: 12) define, 'collaborative learning means that knowledge is not something that is delivered to students, but rather something that emerges from active dialogue among those who seek to understand and apply concepts and techniques. So, student-student interaction in collaborative learning communities may contribute to the achievement of educational goals by influencing educational motivation and aspirations through peer relationships'. In addition, group investigation is a technique of collaborative learning, students have to divide roles and responsibilities of members in group and work together. So, the researcher was interested to study e-Learning using collaborative learning via social media on competency of using information and communication technology of undergraduate educational students. Competency of using information

and communication technology and collaboration are becoming more and more important in today's world, it is therefore essential to prepare educational students while they are in academic in order to be effective teachers in the future and their life-long learning. As, Thai Qualifications Framework for Higher Education : TQF : HEd and 21<sup>st</sup> Century Skills encourage to focus on competency of using information and communication technology and collaboration. Thus, the purposes of this research were:

- **To compare learning achievement of students who learned with e-Learning using collaborative learning via social media on the course of Introduction to Educational Media between pretest and posttest.**
- **To study competency of using information and communication technology of students who learned with e-Learning using collaborative learning via social media.**
- **To study the opinions of students towards e-Learning using collaborative learning via social media.**

## **2) RESEARCH METHODOLOGY**

This experimental research employed one group pretest posttest design.

### **2.1) Population and Sample**

#### *2.1.1. Population*

The population was 32,139 second-year undergraduate students in Faculty of Education around Thailand, in the second semester of academic year 2011. (Office of the Higher Education Commission, Data on February 17, 2011)

#### *2.1.2. Sample*

The sample was 180 second-year undergraduate students in Bachelor of Education Program in Thai, English, Social

studies, Teaching Chinese as a foreign language Faculty of Education, Silpakorn University, who registered in 468 101 Introduction to Educational Media course in the second semester of academic year 2011 by purposive sampling.

## 2.2) Research Instruments

2.2.1. *8 lesson plans on e-Learning using collaborative learning via social media.*

2.2.2. *Learning Management System using collaborative learning via social media.*

2.2.3. *Competency of using information and communication technology test.*

2.2.4. *Behavior observation form of using information and communication technology.*

2.2.5. *The learning achievement test.*

2.2.6. *Instructional media product evaluation form.*

2.2.7 *Wiki contributions evaluation form.*

2.2.8. *Questionnaire on students' opinions towards e-Learning using collaborative learning via social media.*

## 2.3) Research Procedure

According to the research, e-Learning using collaborative learning via social media was fully online learning. Thus, face to face orientation for students was necessary in the online learning process. In this research, collaborative learning with group investigation technique 6 steps was conducted throughout 5 weeks (2 times per week) of experiment.

Orientation : On the first week, students were introduced about learning process, how to use learning manage system (LMS) (<http://elearning.educ.su.ac.th>) and social media: Wikispaces ([www.wikispaces.com](http://www.wikispaces.com)), Mind42 ([www.mind42.com](http://www.mind42.com)) and Youtube ([www.youtube.com](http://www.youtube.com)) in the classroom. Next, students were asked to form a team of 6 members and divide roles and responsibilities of members in group. So, there were 30 groups from 180 students. Then, each group was assigned to build

wiki to work together and 30 wiki links were shown on LMS in order to let students easily learn on the behavior and knowledge of each other. They also were asked to complete the 30-item multiple choice learning achievement test and self-evaluation competency of using information and communication technology test with a five point Likert scale on LMS this week before learning.

Step 1 Identifying the topic : Students learned about Educational Technology and Innovation on LMS. Then, each group was assigned the task 1 of seeking problems in education today on internet, analyzing one problem and finding how to solve it. Then, students worked collaboratively as a group on wiki. Students who were recording observer in each group and the researcher had to complete the online behavior observation form of using information and communication technology after finishing task 1.

Step 2 Considering the topic : Students learned about Principles and Concepts of Selecting, Producing and Utilizing Educational Media and about Instructional Design on LMS. Then, each group was assigned the task 2 of solving the problem that was chosen in task 1 by using an instructional media. This task, students had to select an instructional media and use a mind map to explain reasons. Then, students worked collaboratively as a group on Mind42, collaborative mind mapping and embedded its code on wiki. Recording observer in each group and the researcher completed the online behavior observation form of using information and communication technology after finishing task 2.

Step 3 Planning the investigation in group: Students learned about The ASSURE Model on LMS. Then, each group was assigned the task 3 of planning utilizing the instructional media by The ASSURE Model and worked together on wiki.

Recording observer in each group and the researcher completed the online behavior observation form of using information and communication technology after finishing task 3.

Step 4 Carrying out the investigation : Each group of students was assigned to produce the instructional media. While they were producing product, they had to inform progression of producing on LMS webboard by picture or what they like.

Step 5 Present the result of investigation : Each group of students presented the instructional media product through video clip - Youtube and embedded its code on wiki.

Step 6 Evaluation achievement : Students were asked to complete the 30-item multiple choice learning achievement test, self-evaluation competency of using information and communication technology test with a five point Likert scale after learning and answer to the online opinions questionnaire.

The researcher collected the data and analyzed them using mean, standard deviation and t-test dependent.

### 3) RESEARCH RESULTS

*3.1 The result of a comparison learning achievement of students who learned with e-Learning using collaborative learning via social media between pretest and posttest.*

The pretest and posttest mean scores were compared by using a paired samples t-test. The result indicated that the posttest mean score obviously higher than the pretest at 0.01 level of significance. (See Table 1)

Table 1 : Mean Scores of the Pretest and Posttest

|          | N   | $\bar{x}$ | S.D. | t      | Sig. |
|----------|-----|-----------|------|--------|------|
| Pretest  | 180 | 19.12     | 5.61 | -17.09 | .000 |
| Posttest | 180 | 25.37     | 3.07 |        |      |

Moreover, students' instructional media products were evaluated by instructional media product evaluation form using the researcher's rubric based on 7 criteria and a 3-point scale, consist of 1) Content 2) Learning Objective 3) Suitability 4) Design 5) Creative Thought 6) Usability and 7) Presentation. The researcher and a instructor then checked the products of 30-group students using the same criteria. The result showed that producing instructional media products of students who learned with e-Learning using collaborative learning via social media was good level. ( $\bar{X}$  =2.67, S.D.=0.44) (Pearson Correlation between two checkers was 0.84)

*3.2 The result of studying competency of using information and communication technology of students who learned with e-Learning using collaborative learning via social media.*

The result showed that competency of using information and communication technology of students who learned with e-Learning using collaborative learning via social media was high level. ( $\bar{X}$  =4.15, S.D.=0.68). According to 6 elements of competency of using information and communication technology, 1) Define and Access 2) Manage 3) Evaluate 4) Integrate 5) Create and 6) Communicate, then found that after experiment every elements of competency of using information and communication technology of students were higher than before experiment.

For wiki, students' wikispaces were evaluated by the wiki contributions evaluation form using the researcher's rubric based on 6 criteria and a 4-point scale, consist of 1) Content 2) Organization 3) Attractiveness 4) Accuracy 5) Hyperlinks 6) Group Collaboration. After researcher checked wikispaces of 30-group students, the result indicated that wiki contributions of students who learned with e-Learning using collaborative learning via social

media was very good level ( $\bar{X}=3.57$ , S.D.=0.86).

Furthermore, each student's behavior of using information and communication technology was checked by the researcher using rubric. The behavior scores were calculated for mean. Two scores from students who were Recording observer and the researcher were combined and divided by two to find out the mean score. It showed that students' behavior of using information and communication technology was good level.

### 3.3 The result of studying the opinions of students towards e-Learning using collaborative learning via social media.

To study the opinions of students, they were asked to answer to the online opinions questionnaire after learning. Thus, the researcher received the answer from 174 students. The result indicated that the opinion of students towards e-Learning using collaborative learning via social media was good positive level ( $\bar{X}=4.13$ , S.D.=0.74)

## 4) CONCLUSION

The research finding indicates that first, learning achievement of students who learned with e-Learning using collaborative learning via social media, posttest was higher than pretest at 0.01 level of significance and producing instructional media products of the students was good level.

Second, competency of using information and communication technology of students who learned with e-Learning using collaborative learning via social media was high level. Obviously, e-Learning using collaborative learning via social media helps the students to improve their competency of using information and communication technology all elements. In addition, wiki contributions of the students was very good level.

Third, the opinion of the students towards e-Learning using collaborative learning via social media was good positive level.

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## 5.2) Appendices

### Appendix A: Example of Students' Instructional Media Products



### Appendix C: Example of Students' Wiki Contributions



### Appendix B: Example of Students' Youtube Video Clips





## **A Study of Interest using Internet in Learning Activities of Basic Non-formal Education Learners**

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### **ABSTRACT**

**This research is aimed to study state and interest in learning activities of basic non-formal education learners. The samples are comprised of 398 junior high school learners in the basic non-formal education program in three provinces which are Nakhon Pathom, Kanchanaburi and Ratchaburi. The tool was a questionnaire asking for the learners' interest of their learning activities via internet in 4 domains including (1) learning sources, (2) learning via internet, (3) Sharing of knowledge and (4) preparedness of school. The data analysis was conducted by using descriptive statistics and one-way ANOVA. The findings revealed that Non-formal education have schools which support Non-formal education covering all provinces, districts and regions of Thailand. Also they have prepared equipment for learning via internet which can access in anywhere and anytime. Considering interest in learning activities via internet found that the most learners' interest was using computers from learning sources. Learners which are ages less than 35 years were interested in learning activities via internet in all aspects and learners which have a high goal were interested in learning using new technology such as learning via internet as well.**

### **Keywords**

Interest using internet, learning activities, non-formal education, learners.

### **1) INTRODUCTION**

Ministry of Education specifies that education management via internet is one of priority policy by made E-learning database plan both free, credit enrollment and Informal learning (Torrarin, 2007). Bureau of Non-Formal Education (BNFE) gives an important with information technology continuously including support using technology for Non-formal education (Kaewdang, 1993). Besides, the policy and strategy of Non-formal education for budget year 2004 and operation focus on tactics to practices of Non-formal education for budget year 2005 define guideline and measure in promotion and support providing learning sources, media and technology for serving sufficiently (The Office of Non-formal Education, 2003). In management of knowledge system, they build connection with learning sources both inside and between communities in order to build learning network broadly and cover country. This is that information and communication technology (ICT) is used administration machinery on a process of knowledge management (The Office of Non-formal Education, 2005). For the way of learning activities which consistent learners' need, they can choose in many methods variously consist of learning from several media especially e-Learning. Moreover the vision of Bureau of Non-

Formal Education also focuses that learners and people have a chance to access and to use information and communication technology for life-long learning of their full potential (The Office of Non-formal Education, 2006) as well as defining strategies and tactics in order to create opportunity, increase ability and improve learning standard with e-Learning. Therefore, they support in providing and distributing basic infrastructures of information and communication technology.

A study state and interest in learning activities of non-formal education students in the lower central part of Thailand is thus conducted. This study can realize of state, devices, infrastructures, learning media and technology in currently and guideline in learning via internet of Non-formal education which is appropriate and applied to consistent with learners' need and life-long learning management. Moreover, the finding from this study will also offer a way to develop quality Thai personnel and they can develop themselves and their country and also adapt changing the world currently.

## 2) OBJECTIVE

To investigate interest in the learning activities of basic Non-formal education learners in the lower central part of Thailand.

## 3) RESEARCH TOOL AND METHOD

The present research was document analysis and data survey about interest in learning activities via internet of basic Non-formal education students in the lower central part of Thailand. The questionnaire was conducted with the 398 students of basic Non-formal education schools in the three provinces located in the lower central part of Thailand. The three provinces were Nakhon Pathom, Kanchanaburi and Ratchaburi.

## 3) STUDY RESULTS

### 3.1) Current state of Non-formal

#### *Education in Thailand*

According to study and analysis documents, planning division of the Office of Non-formal and Informal Education (2011), Ministry of Education (MOE), reports the statistical data about Non-formal education, as of September 30, 2011, as shown in the following table.

Table 1: Showing the number of institutes under the Office of Non-formal and Informal Education classified by levels

| <b>LEVELS</b>   | <b>NUMBER(CENTRE)</b> |
|---|-----------------------|
| Provincial the Office of Non-formal and Informal Education<br>( include Bangkok the Office of Non-formal and Informal Education)    | 77                    |
| District the Office of Non-formal and Informal Education<br>( include Area the Office of Non-formal and Informal Education)         | 927                   |
| Sub district the Office of Non-formal and Informal Education<br>( include Precinct the Office of Non-formal and Informal Education) | 7,403                 |
| Public libraries  | 853                   |
| Community Learning Centre   | 1,340                 |
| <b>TOTAL</b>  | <b>9,390</b>          |

Table 2: Showing the number of students enrolled Basic Non-formal Education Curriculum in 2010 classified by educational levels

| <i>Educational levels</i>        | <i>Number of students(person)</i> |
|----------------------------------|-----------------------------------|
| Primary education                | 75,036                            |
| Lower Secondary education        | 393,663                           |
| Upper Secondary education        | 600,608                           |
| Vocational certificate education | 15,548                            |
| <b>Grand total</b>               | <b>1,084,855</b>                  |

According to budget 2010, the Office of Non-formal and Informal Education has provided of ICT infrastructure

to promote the study of informal education as the following table (Boonyakiat, 2012)

Table 3: Showing the budget of educational support projects (quality enhancement of informal education)

|   | <b>Budget(Baht)</b>  |
|---|----------------------|
| <b><u>The Project under Thai Khem Kaeng Action Plan 2012</u></b>  |                      |
| Activities to provide ICT infrastructure for promoting informal education   | <b>177,825,000</b>   |
| - Computer with devices total 750 locations   | 155,325,000          |
| - Installation and internet link in community learning centre total 750 locations   | 18,000,000           |
| - Activities arrangement in community learning centre in community learning centre total 750 locations                                | 4,500,000            |
| <b>Grand total</b>  | <b>177,825,000</b>   |
| <b><u>The Project under Thai Khem Kaeng Action Plan 2012 (the Economy Recovery Plan for the 2<sup>nd</sup> stage)</u></b>             |                      |
| 1. Development and improvement equipment for television stations  | <b>328,845,900</b>   |
| 2. Development of public libraries as lifelong learning centers for community   | <b>748,100,000</b>   |
| - Purchase of books and electronic media total 850 locations, each locations is 450,000 baht  | 382,500,000          |
| - Purchase of books and electronic media(new libraries) total 50 locations, each locations is 1, 000,000 baht                         | 50,000,000           |
| - Activities to promote reading total 850 locations, each locations is 100,000 baht   | 85,000,000           |
| - Computer with devices total 250 locations   | 25,700,000           |
| - Link of system for data retrieval in public libraries provinces total 75 locations, each locations is 400,000 baht                  | 30,000,000           |
| - Web site development for linking various learning resources.  | 4,000,000            |
| - Construction of public libraries (for districts that do not have a library) 50 locations, each locations is 1,800,000 baht          | 90,000,000           |
| - Providing of equipment for public libraries (for districts that do not have a library) 50 locations, each locations is 178,000 baht | 8,900,000            |
| - Purchase of mobile car for service total 24 cars  | 72,000,000           |
| <b>Grand total</b>  | <b>1,076,945,900</b> |

### ***3.2) Interest in the Learning Activities via Internet***

The study of interest in the learning activities via internet of basic non-formal

learners, the samples is female more than male (58.3% and 41.7% respectively). The mean age is 23.7 years. The result shows as following table.

Table 4: Mean and Standard Deviation of Interest in the Learning Activities via Internet

| Interest  | Rank | $\bar{X}$   | S.D.        |
|---|------|-------------|-------------|
| 1. Using personal computer at home  | 3    | 3.60        | 1.00        |
| 2. Learning via internet  | 9    | 3.38        | 0.93        |
| 3. Contact and learning with instructors using communication tool           | 6    | 3.51        | 0.88        |
| 4. Sharing of knowledge and opinion through electronic media                | 10   | 3.36        | 0.94        |
| 5. Academic institutes has provided learning and teaching via internet      | 7    | 3.47        | 0.93        |
| 6. Staff advice about learning and teaching via internet                    | 6    | 3.51        | 0.88        |
| 7. Supporting in learning equipment via internet                            | 4    | 3.56        | 0.93        |
| 8. Instructors teach by using learning via internet                         | 2    | 3.61        | 0.86        |
| 9. Using computer from learning sources                                     | 1    | 3.65        | 0.86        |
| 10. Learning from online and offline lessons                                | 8    | 3.44        | 0.96        |
| 11. Learning sources which computer, applications and network are available | 5    | 3.55        | 0.92        |
| 12. Learning by using network system via internet                           | 6    | 3.51        | 0.93        |
| <b>Grand total</b>  |      | <b>3.51</b> | <b>0.74</b> |

Table 4 shows that learners' interest in the learning activities via internet as a whole were at "high" level ( $\bar{x} = 3.51$ ). The high average score were learning sources, instructors teach by using learning via internet, using personal computer at home, supporting in learning equipment via internet, learning by using via internet, learning sources which computer, applications and network are available, staff advice about learning and teaching via internet, learning by using network system via internet and Contact and learning with instructors using communication tool ( $\bar{x} = 3.65, 3.61, 3.60, 3.56, 3.55, 3.51, 3.51$  and  $3.51$ , respectively); whereas academic institutes has provided learning and teaching via internet, learning from online and offline lessons, learning via internet and sharing of knowledge and opinion through electronic media were at "moderately" level ( $\bar{x} = 3.47, 3.44, 3.38$  and  $3.36$ , respectively)

Regarding the "interest group" which is an important aspect in the learning activities, we further divided this aspect into four

models: (1) learning sources, (2) learning via internet, (3) sharing of knowledge and (3) preparedness of school. The age range was divided into 3 groups: 14-25, 26-35 and more than 35 years. The analysis of variance classified by 4 aspects was conducted as illustrated in the following table.

Table 5: Comparison of Interest in the Learning Activities of Basic Non-formal Education Learners divided by Age

|    | 14-25     |       | 26-35     |       | > 35      |       | F-test |
|----|-----------|-------|-----------|-------|-----------|-------|--------|
|    | $\bar{X}$ | SD.   | $\bar{X}$ | SD.   | $\bar{X}$ | SD.   |        |
| 1. | 33.65     | 00.75 | 33.61     | 10.74 | 33.14     | 10.96 | 6.96*  |
| 2. | 33.52     | 00.79 | 33.52     | 00.76 | 33.04     | 00.88 | 6.24*  |
| 3. | 33.47     | 00.77 | 33.48     | 00.82 | 33.01     | 00.86 | 5.78*  |
| 4. | 33.53     | 00.77 | 33.66     | 00.77 | 33.23     | 00.83 | 3.55*  |

\* $P < .05$

Table 5 reveals that learners who have different age significantly showed different interest about the learning activities via internet in all aspects. The average score showed that non-formal learners who have "14-25" and "26-35" years showed greater interest about the learning activities via internet in all aspects than those with ">35" years.

Goal of life was also studied to find whether or not it was related to the overall learners' interest. The goal of life was divided into 3 groups: very much, much and moderate. The analysis of variance classified by 4 aspects was conducted as illustrated in the following table

It was found that learners have different opinions significantly in the learning activities via internet in learning via internet and preparedness of school aspects.

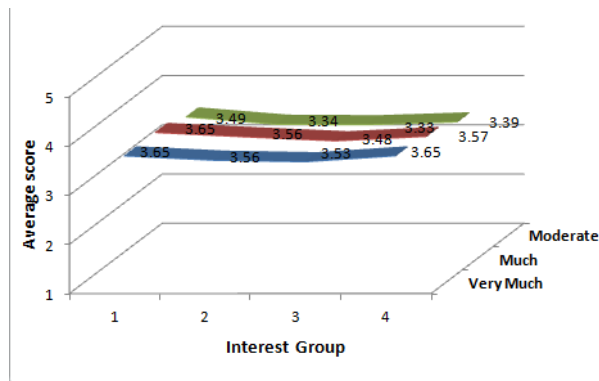


Figure: 1 Illustrate the Interest Level in the Learning Activities via Internet divided by Goal of Life

From the average score, it was found that learners who had “very much” goal showed greater opinions about interest in the learning activities via internet in all aspects than others with “much” and “moderate” life goals.

### 3) DISCUSSION

According to the policies and the focus of action plans of the Office of Non-Formal and Informal Education for fiscal year 2011(The Office of Non-formal and Informal Education,2011), it specifies community indicator which are available of learning sources to provide and to support life-long learning. Also, educational technology, information and communication technology are used to manage organization and service in learning of people. This is consisted with data report about agencies and academies

of NFE which is covered and accessed in all country, including installation of computer devices and internet infrastructure. Moreover, the Ministry of Education consents to all sub-district NFE that has wireless internet (Wi-Fi), cooperated with the Ministry of Information and Communication Technology as well (The Office of Non-formal and Informal Education, 2012).

The result of this study, it was indicated that average score as a whole was at “high” level. The highest average score was learning sources. This can be explained that the government policy about providing ICT infrastructure to the communities even more. According to study of Jongrak Chiangtawan(2003) about service management of Non-formal education of community learning centre. It was found that location centre is inappropriate, the service of publication media and electronic media are not enough, lacking the budget and public relation including less community participation. Therefore, to manage and service in educational should be provide appropriately and comprehensively as well as accessible from all learning sources. The next average score, learners require that instructors teach by using learning via internet and to use personal computer at their home because currently information and communication technology is an important in all sides such as work, study and entertainment. Especially, all families also have personal computers at home for working and communication. Thus, learning via internet is the main guideline that learners have an opportunity for life-long learning, not limit with locations and time including education policies afford computer learning center for sub-district. This is alternatives for learning conveniently and also has instructors to recommend knowledge.

Considering age range, it was shown that learners who are less than 35 years are

more interested in learning activities via internet than those with older age. Based on Modern Adult Learning Theory of Malcolm S. Knowles (1978) in Needs and Interests, it was found that Adults are motivated to learn well, if it is the same as their needs and interests of past experience. They would be satisfied, so learning activities should be consistent with learners' need as adults to adapt in their works and daily life involving effectiveness of learning activities of Non-formal education as well.

Concerning goal of life, non-formal education learners with high goal of life were of high opinions about interest in the learning activities via internet. This is consistent with Irving Lorge (1947) mentions to how to learn of adults that "To manage a good adult education, we must be understand that what they need," and he specifies needs of adults in learning 4 areas: (1) to gain something, (2) to be something, (3) to do something and (4) to save something (Edmunds, K, M & A, 1999). For this reason, to devise a pedagogic plan and learning activities, educational service provider should formulate clear goals of learning for learning aptitude achievement.

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## **The Development of Online Instructional Media on Information Technology for Learning**

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### **ABSTRACT**

The purposes of this research were to develop and investigate the effectiveness of online instructional media on “Information Technology for Learning”; compare students’ learning achievement between the pre-test and the post-test; compare their learning achievement between the group learning from online instructional media and the group learning from traditional lectures; and investigate their satisfaction with online instructional media. The subjects were the 1<sup>st</sup> year students in the academic year 2011 in the bachelor's degree of physical education at Institute of Physical Education Suphanburi Campus. They were divided into two groups: the experimental group comprising 40 subjects and the control group comprising 40 subjects. The findings revealed as the following :1) The research was found that the online instructional media on “Information Technology for Learning” met the efficiency at 83.05/82.10; 2) The students’ learning achievement of online instructional media on “Information Technology for Learning” of the post-test was higher than that of the pre-test; 3) The result of learning achievement comparison between the group learning from online instructional media and the group learning from traditional lectures was found that the mean score of the students learning from online instructional media was higher than that of the students learning from traditional lectures; and 4) As a whole the students were highly satisfied with online instructional media on “Information Technology for Learning”.

### **Keywords**

online instructional media, moodle, effectiveness, achievement, Information Technology

### **1) INTRODUCTION**

Institute of Physical Education Suphanburi Campus is one of the seventeen campuses under Institute of Physical Education, Ministry of Tourism and Sport. It comprises three faculties in the bachelor’s degree; faculty of education, faculty of sports and health science, and faculty of liberal arts. There are seven programs in the campus as follows: Physical Education, Sports Science, Sports Coaching, Sports Management, Sports Communication, Commercial Recreation and Tourism. In all programs, students must take the course, Information Technology for Learning. This course is about the introduction to information and technology to help them achieve knowledge and understanding of data and information management and enable them to use the system programs and application programs. They need to understand data communications and computer networking which are difficult for them to remember all contents. Learning from online instructional media can broaden their knowledge and experience at any time and anywhere. Advantages in information and communication technologies (ICT) have built up new opportunities in the educational world. Also, the ICT has been taken into consideration for the higher education to move forward from the traditional classroom to the online learning environment (Cosgrove and Maryellen S., 2002). Several benefits have been clearly identified (Emerson and MacKay, 2010).

For example, online learning or e-Learning provides flexible learning alternatives compared to traditional classroom learning such as the possibility for the learner to gain knowledge at their own pace without being constrained by location or time. Online learning environments are more prevalent in education than ever before. In 2010, many instructors were attempting to emulate traditional instructional methods in the online learning environment as much as possible (Feng-jung Liu and Bai-Jiun Shih, 2007). Accordingly, this study aims at developing and finding the effectiveness of online instructional media on “Information Technology for Learning” in the Institute of Physical Education Suphanburi Campus.

## **2) RESEARCH OBJECTIVES**

- 2.1) To develop and find out the effectiveness of online instructional media on “Information Technology for Learning”
- 2.2) To compare students’ learning achievement between the pre-test and the post-test
- 2.3) To compare students’ learning achievement between the group learning from online instructional media and the group learning from traditional lectures.
- 2.4) To investigate students’ satisfaction with online instructional media.

## **3) SCOPE OF STUDY**

### **3.1) The population and the sample study**

The research populations for this investigation were the 1<sup>st</sup> year students in bachelor's degree of physical education in Institute of Physical Education Suphanburi, who enrolled in the entire academic year of 2011. There were 220 subjects.

The samples were there upon divided into two groups. In the experimental group, there were 40 subjects while in the control group there were 40 subjects .

## **3.2) Variables**

### **3.2.1 Independent variables:**

- online instructional media on “Information Technology for Learning”.
- teaching methodology

### **3.2.2 Dependent variables:**

- students’ learning achievement
- students’ satisfaction with online instructional media.

## **4) TOOLS**

4.1) online instructional media on “Information Technology for Learning” developed with Dreamweaver CS3 and Moodle Program.

4.2) constructed learning achievement test containing 70 items and reliability (KR-20) at 0.84

4.3) questionnaire on satisfaction with online instructional media on “Information Technology for Learning” consisting of 10 questions.

## **5) METHODOLOGY**

### **5.1) Data collection**

5.1.1 The experimental group was introduced how to use the online instructional media on “Information Technology for Learning”.

5.1.2 The control group was introduced how to learn from traditional method.

5.1.3 The experimental group learned the contents of seven chapters from the online instructional media on “Information Technology for Learning” for seven weeks and took a 10-item chapter quiz at the end of each week. After that, they took a post-test or a learning achievement test while the control group learned the contents of seven chapters from traditional method for seven weeks before they took a post-test or a learning achievement test.

5.1.4 The experimental group answered questionnaire regarding their satisfaction and comments with online instructional



media on “Information Technology for Learning”.

**5.2) Data analysis**

5.2.1 The effectiveness of online instructional media on “Information Technology for Learning” was found out by using formula  $E_1/E_2$ .

5.2.2 The students’ learning achievement between the pre-test and the post-test was compared by mean score and dependent t-test.

5.2.3 The learning achievement between the group learning from online instructional media and the group learning from traditional method was compared by mean score and independent t-test.

5.2.4 The satisfaction with online instructional media on “Information Technology for Learning” was found out by mean score and standard deviation.

**6) RESULTS**

6.1) The research was found that the online instructional media on “Information Technology for Learning” met the efficiency at 83.05/82.10 level of criteria standard, which was higher than set standard at 80/80. This media can be used efficiently for learning and teaching.

6.2) The students’ learning achievement of online instructional media on “Information Technology for Learning” of the post-test was higher than that of the pre-test and showed statistical difference at the .05 level of significance.

Table 1: Comparison of learning achievement from online instructional media on “Information Technology for Learning”.

| Experiment | n  | $\bar{X}$ | S.D. | t      | Sig. |
|------------|----|-----------|------|--------|------|
| Pre-test   | 40 | 31.20     | 4.64 | 31.54* | .00  |
| Post-test  | 40 | 57.93     | 2.37 |        |      |

\* level of significance .05

The table showed that the learning achievement mean score of the pre-test was 31.21 while the mean score of the post-test was 57.93. The mean scores were statistically different at level .05 of significance. The post-test was higher than the pre-test.

6.3 The result of learning achievement comparison between the group learning from online instructional media and the group learning from traditional method was found that the learning achievement mean score of the two groups was statistically different at the .05 level of significance, and the mean score of the students learning from online instructional media was higher than that of students learning from traditional method.

Table 2 : Comparison of learning achievement from online instructional media on “Information Technology for Learning” and traditional method.

| Experiment         | n  | $\bar{X}$ | S.D. | t     | Sig. |
|--------------------|----|-----------|------|-------|------|
| Control group      | 40 | 49.35     | 5.87 | 6.70* | .00  |
| Experimental group | 40 | 57.93     | 2.37 |       |      |

\* level of significance .05

The table showed that the learning achievement mean score of the control group was 49.35 while the mean score of the experimental group was 57.93. The mean scores were statistically different at level .05 of significance. The experimental group was higher than the control group.

6.4) The average mean score of the satisfaction with evaluation was 4.19 and the standard deviation was 0.50, showing that it was in a high level. As a whole the students were highly satisfied with online instructional media. As separated items, they were highly satisfied with each item; usability ( $\bar{X} = 4.46$ ), content appropriateness ( $\bar{X} = 4.32$ ), font and graphics ( $\bar{X} = 4.14$ ), child centered activities ( $\bar{X} = 4.11$ ),

exercises and tests ( $\bar{X} = 4.07$ ), and language use ( $\bar{X} = 4.07$ ).

## 7. DISCUSSION

7.1) The effectiveness of online instructional media on Information Technology for Learning at 83.05/82.10 which was higher than determined value at 80/80 resulted from the good quality review in content and media production conducted by 3 research advisors, and a test try-out conducted by the researcher.

7.2) Proper content and element had a direct effect on the learning achievement of experimental group which was higher than that of the control group. They, hence, were able to learn upon their capacity, study the lessons repeatedly, and sequence the lessons upon their needs and satisfaction. This made their learning achievement higher. The findings complied with the study by [Sureporn Pawutipattarapong](#). (2007) who pointed out advantages of e-Learning that learners could study, repeat the lessons and create self-constructed knowledge.

7.3) Online instructional media on Information Technology for Learning had got high satisfaction which complied with the study of “The Development of Online Instruction Media and Administration System base-on Moodle Program” by Prapas Thepthong (2011) indicating that 90 aspects (100 percent) of evaluation and average comment were high because the lessons could satisfy learners’ needs in term of output, menu, content module and test system.

## 8) CONCLUSION

The study on “The Development of Online Instructional Media on Information Technology for Learning” for the first year students in the faculty of education in the second semester of academic year 2011 at Institute of Physical Education Suphanburi can be concluded that the media was

practical. The content analysis for effectiveness had shown lesson effectiveness ( $E_1/E_2$ ) at 83.05/82.10 which was higher than criteria at 80/80. The learning achievement of online instructional media on Information Technology for Learning was statistically different at the .05 level of significance. Learning achievement in the experimental group was higher than that in the control group, and the students were highly satisfied with online instructional media on Information Technology for Learning.

## 9) ACKNOWLEDGEMENT

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# **Blended e-Learning Activities for the Information and Innovation Management Course: Its Outcomes of Graduate Students at Bangkok-Thonburi University**

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## **Abstract**

The objective of this research was to investigate how blended e-Learning activities for the Information and Innovation Management Course would affect learning outcomes of graduate students of Bangkok-Thonburi University. The blended e-Learning course was conducted in both face-to-face and online learning settings by using activities and assignments such as exercises, homework, research and organizational analysis on information management. Bangkok-Thonburi University's 90 graduate students on Srisaket Campus were recruited with use of a method of simple sampling. The research findings revealed that students had learning outcome at a good level and satisfaction of blended e-Learning activities at the highest level.

**Keywords:** e-Learning, blended learning, online learning activity

## **1) Introduction**

Learning management in a graduate level refers to excelling in knowledge and research, which requires learners to practice independent study. In the same direction, students are expected to analyze theories and principles on a profound basis in order to create a novel body of knowledge and a knowledge structure of their own. Participatory learning and instruction is a pedagogical approach aiming at administrative learning to participate in knowledge management with an emphasis on student-centered approach that enables learners to specify their content knowledge and research content as well as learner autonomy. Learners' participation is associated with content-based course description which specifically leads to learners' requirement for their learner autonomy and research.

The Information and Innovation Course is a major subject matter required for graduate study. Instructors are therefore

responsible to develop e-Learning systems on the Internet as a medium of teaching and learning in a graduate study level, which needs availability where the Internet exists. Students must be able to review their lessons outside the classroom. Blended e-Learning activities are developed by deploying samples and case studies on information and innovation management online activities to supplement graduate students on knowledge development. Students are also able to consult their instructors online. The online system enables students to analyze and synthesize information and innovation management in various aspects of the content-based activities.

The researchers being as graduate instructors develop teaching and learning methods for online lessons in accordance with education management framework. The online lessons are created based on learners' requirement and participation. Students' participation enables them to learn from their autonomy experiences in information and innovation management as well as the processes and methods of learning case studies in modern learning processes. The University also benefits from these activities in establishing online activities and learning for its prospective graduate students.

## **2) Research Objectives**

- 2.1) To develop e-Learning module for the Information and Innovative Management Course by using blended learning online activities for undergraduate students;
- 2.2) To examine the outcomes of students employing blended e-Learning activities in the Information and Innovative Management Course; and
- 2.3) To survey students' satisfaction on e-Learning teaching approach by using blended e-Learning activities.

## **3) Scope of Study**

The population of this research was all graduate students of Bangkok-Thonburi University, enrolled in the entire academic year of 2010.

The samples were graduate students of Bangkok-Thonburi University, taking the Information and Innovation Management Course on Srisaket Campus in the academic year of 2010. The total recruited students were 90.

## **Research Variables**

Independent variables were:

1. e-Learning of the Information and Innovation Management Course
2. blending e-Learning approach

Dependent variables were:

1. learning outcomes

2. five areas of satisfaction including content and style, testing, visual aids and language, letters and colors, and lesson management.

#### **4) Pertinent Literature Review**

E-Learning is defined as teaching and learning techniques with use of electronic media that enhance learners autonomy. It is obvious to see that web-based instruction and e-Learning have played a vital role in teaching and learning at tertiary levels. A large number of universities overseas offer courses online through e-Learning, and so does Thailand.

Trends in use of technology to extend economy in the 21<sup>st</sup> century show an increasing use of electronic communication, especially on the Internet. Such increase manifests in all sectors particularly schooling. More tertiary institutions are offering teaching and learning online. Many universities in other countries offer degree programs online as well. Each program is called differently, for example, distance education, education dissemination, online education, web-based teaching courses, or e-Learning (Lao and Gonzales, 2005). Despite these name differences, there is no confusion of teaching and learning through e-Learning system. In fact, it regards the issue of identity that each institution wants to present its own uniqueness.

The Office of the National Education Commission (2005) is responsible for all tertiary institutions throughout Thailand and has policy to promote the national education through the Internet. Therefore, the Office decided to organize a project known as Thailand Cyber University (TCU) to provide all citizens from all professions with e-Learning services through Inter-University Network: UniNet). The purpose was to create more opportunity for all citizens to pursue their higher education, which would make learning-based society. For TCU preparation, the Office initially promoted and encouraged state university lecturers to produce online modules collaboratively so that they could share their work during 1997 and 2003. The modules of 128 courses were completed. By the budget of fiscal year 2005, other 331 subjects were expected to finish.

In addition, high quality e-Courseware, especially foundations of engineering courses, were produced by Faculty of Engineering, Kasetsart University. The purpose was to aid teaching in a face-to-face or regular classroom, get learners attention and help learners to understand more of the course content. In terms of learning management system (LMS), the Office of the National Education Commission hired the Continuing Education, Center Chlalongkorn

to develop computer system, which included content management system (CMS) and students management system (SMS). All of these systems are actually e-Learning. Moreover, other universities have widely applied e-Learning to their pedagogy.

On one hand, educational institutions have increasingly added teaching and learning in the form of e-Learning. On the other, several state and private sectors have placed an emphasis on applying electronic media to virtual learning. The electronic media are tools that can reduce training costs as compared to the old-fashioned style of sending off staff to training programs in remote areas or hiring a quest speaker along with renting a training room. The electronic media are low cost because they can be re-used many times and the organizers can control the training content and assess trainees systematically.

E-Learning is considered an appropriate tool for educational management at a tertiary level because learners are mature enough to be responsible for themselves and the learning and teaching program. In addition, learners are adequately competent in use of information technology, handling with tools on the e-Learning system comfortably. Similar to use of e-Learning for training, trainees must learn how to operate the online system in accordance with the

organization's requirements. This argument can be concluded that e-Learning suits adult learners whose maturity is full and it is good for tertiary students who are ready to enter the real world rather than younger learners like primary or secondary.

## **5) Research Procedure**

The research team starts developing the system by analyzing course content and e-Learning design. Data were then garnered from graduate students as follows:

1. Data were collected by means of lecturers' and students' participatory process or experimental study. The process began with content analysis, scope of content design, determination of objectives, and writing script and flowchart. This process were monitored on LMS.

2. After collaborative development of e-Learning, the researchers gave Moodle e-Learning training program to students to enable them to study independently through e-Learning web: <http://www.bkkthon.net>. Students' knowledge were also assessed using an achievement test.

3. The researchers combined lecturing with blended e-Learning, which included exercises, homework, research and organizational analysis of information management. Students were assigned to do activities during all lecture sessions and exchange their ideas through e-Learning system.

4. Undergraduate students spent half or 50 percent of their regular-class time studying the Information and Innovation Management. They did 50 percent of activities and additionally research according to each lesson to share with their classmates.

5. After students studied the content of the Information and Innovation Management in each session, they would need to take an achievement test. Then they had to complete exercises online. After finishing all exercises for all contents, students were required to take the same achievement test again.

6. Both lecturers and students first co-assessed quality of e-Learning. Then a specialist was invited to assess the developed e-Learning. The four assessment criteria were adopted from Department of Academic Affairs.

7. Lecturers and students co-summarized the process and procedure of e-Learning activity development, adopted as teaching techniques. They also offered ways to improve and develop more appropriately.

## 6) Findings

The research participants' demographics were 30 males (33%), 60 males (67%), totally 90 people. Their ages ranging between 30 and 39 comprise 22 people (24%), between 40 and 49 comprise

37 (41%) and over 50 comprise 13 (14%). The length of their work experience varied as follows: 19 people (21%) less than 5 years, 10 people (11%) between 5 and 10 years, 19 people (21%) between 11 and 15 years, 13 people (14%) between 16 and 20 years, and 22 people (24%) more than 25 years.

The findings of blended learning for the Information and Innovation Management Course through e-Learning activities showed that the graduate students of Bangkok-Thonburi University could achieve in their learning at a high or good level or 84.59 %. Their learning outcome through e-Learning activities averaged 42.83 % and 41.76 % for their learning from a regular class.

The overall satisfaction of the students with blended learning through e-Learning was at the highest level ( $\bar{x} = 4.61$ ). However, when considering each criterion, they were highly satisfied with all of it: content and style of blended learning through e-Learning activities ( $\bar{x} = 4.62$ ); testing ( $\bar{x} = 4.67$ ); visual aids and language ( $\bar{x} = 4.58$ ); letters and colors ( $\bar{x} = 4.56$ ); and lesson management ( $\bar{x} = 4.63$ ).

## 7) Discussion

The learning outcomes of blended e-Learning activities for the Information and Innovation Management Course at Bangkok-Thonburi University were good.



Their learning outcomes from e-Learning activities and a regular class were both good. Most students agreed to organize blended learning, which combined online with regular class time because this approach would help reduce their problem of being absent from the classroom when they could not make it to either one of those. Teaching materials from both textbooks and electronics as well as appropriate learning settings were of essence (Prece, Eshet-Alkalai, and Alberton, 2009). The analysis can imply that the blended e-Learning module should be developed into different activities, which help enhance students' learning. This implication is parallel with a study conducted by Theprasan et al (2010) synthesizing blended learning and teaching with use of collaborative learning techniques and resulting in better learning.

Managing blended e-Learning in the research for four hours per week, two hours for face-to-face learning in a regular class and another two hours for online learning was seen to be a 50/50 combination. This included the course content equally divided into a half between the fact-to-face and online learning for two hours each. The students' overall satisfaction with the blended learning model was the highest because they were undergraduate students who could study independently apart from face-to-face learning in the classroom.

## 8) Conclusion

The blended e-Learning management is an appropriate approach to teach tertiary students. The reason is that they are experiential and mature enough to study independently without learning face-to-face in the classroom alone. If lectures manage to blend learning activities in a regular classroom with appropriation, students can likewise learn at an appropriate level, by themselves and at virtual time. Such independent learning characterizes undergraduate students who are not only learners but also academics.

## 9) Acknowledgement

We would like to express our gratitude to Dr Warath Prueksakulanun who is not only a specialist of the Office of Strategy Management and Integration in Education No. 4, the Office of the Permanent Secretary, Ministry of Education but also a co-adjunct lecturer of the Information and Innovation Management Course, Bangkok-Thonburi Univeristy, assisting us in system and website <http://www.bkkthon.net>.

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## The Development of Learning Management System in Higher Education Level

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### ABSTRACT

This research is aims 1) To develop Learning management systems for teaching and learning through networking for Higher education, 2) To study the learning achievement of students with learning management systems and learning improved for this research. 3) To study the satisfaction of the students teachers and administrators to network with the developed system. The development of a system using expert assessments and create online lessons. Subject of Systems Analysis and Design effective which they were then tried with the sample of Computer Information Systems students, Society of Information Technology Rajamangala University of Technology Tawan-ok of 30 were used to analyze data to compare achievement before and after the t-test dependent.

Results of the research revealed as followed:

1. The development of a system of evaluating the suitability of EasyLMS according to the criteria of the expert opinion of the average level was 0.91 in the appropriate level.
2. Assessment to determine the efficiency of the system EasyLMS developed through evaluation of technical experts with Black Box Testing Technique all 5 showed that the outcome of the assessment of the overall system performance at a high level.
3. Development of the subject of Systems Analysis and Design via EasyLMS developed. More efficient (E1/E2) 86/89 is the standard criteria.
4. Comparison of academic achievement before and after learning was found that the learning achievement of students before and after school difference is statistically significant at the .01 level.

5. Assessment of user satisfaction, system EasyLMS overall satisfaction with the system can be concluded that the system EasyLMS to teaching and learning, Faculty of Social Technologies, Rajamangala University of Technology Tawan-ok Chanthaburi Campus properly. It also can be used in teaching and learning management system services through a network of other organizations as well.

### Keywords

learning management systems, learning and teaching. Evaluate the performance of the system. Academic Achievement.

### 1) INTRODUCTION

Research on the use of teaching materials through the Internet was found that the performance of the media resulted in a good way (Positive) on academic achievement, as results of the Yarbrough (Yarbrough.2002), which explores various forms application to the Internet in teaching elementary school. It was found that the Internet can be used as a medium for effective teaching and learning [1] learning and teaching via the Internet as a form of learning, teaching is very interested in the field of education. All education levels of the country constitute a response to the National Education Act 2542 to bring technology to developing educational systems and opportunities to spread education to the local far to be equally as educational. Educational development era of changing patterns of teaching and learning, The role of the instructor to be changed from the original. Classroom is not just a rectangular room with a limited framework, Enables learners to gain knowledge and information to keep

pace world.

Rajamangala University of Technology Tawan-ok Education, professional leadership. Quality manpower to international standards based on science and technology to increase capabilities to the competitive economic development and quality of life, social mission of the University Information Technology Rajamangala University of Technology Tawan-ok "To support and promote the development of information systems in the teaching and learning, management and administration by using information and communication technology and training for various aspects of learning", and because government policy on ICT to support people with learning opportunities through Networks and information sources has increased. Development of social and economic principles to the management of ICT allows access to a good knowledge base more . The Government has targeted the development of management in the form of e-Government.

Therefore encourage the development of ICT in areas such as systems to support the MIS system, e-Learning e-Procurement system, etc. The University has the opportunity to develop the ICT systems of the university's information associated with the government and Development Cooperation Information Network aims higher. Create collaboration and education network. As well as the format of study e-Learning (collaboration learning) and the goal, supporting infrastructure, Infrastructure of ICT in higher education institutions.

In both the private and adequate and appropriate encourage networking between higher education institutions focusing on the signal to data communication. For exchange and cooperation sufficiently Data Center for Educational, Courseware collection centers as well as other digital data. Create a standard link exchange information in a systematic and effective and Coordination as (Virtual Organization). To coordinate

care links of technical cooperation and research between the University of ICT personnel.

The objectives of this research are as follows.

1) To develop Learning management system for teaching and learning through networking of higher education.

2) To study the learning achievement of students taught by the developed system.

3) To study the satisfaction of the students teachers and administrators, network On the developed system.

The scope of this research study as follows.

1. To study the material relating to the Learning management system of teaching and learning through networking of higher education.

2. Population and sample of the research is divided into two stages.

2.1 Process analysis system designed by the Educational Technology Specialist 3 people and 3 people of IT professionals from higher education organizations on campus using purposive sampling (Purposive Sampling).

2.2 Test procedures, installation and evaluation system Lecturer in Computer Information Systems and computer science. Choose a particular (Purposive Sampling) 3 students, in computer information systems who enrolled subjects Analysis and design in the first semester academic year 2553 of 30 students, and 3 people of network administrators, academic Resource Center Rajamangala University of Technology Tawan-ok using purposive sampling (Purposive Sampling).

Developed system is a Web application development with PHP and Java as the main operating system Linux and My SQL database accessible via the network.

## 2) PAPER INSTRUCTIONS

Components of the system can be described in detail EasyLMS three parts as follows.

## **2.1) Information Management System of member.**

*2.1.1 Registration system's end users, to change the level and access.*

*2.1.2 Approve the registration system to use. (Admin).*

*2.1.3 System, application or enrollment verification each course.*

*2.1.4 System and cancel the approval to students enrolled in each course. (For teachers).*

*2.1.5 Information recording members system.*

*2.1.6 Edit Information of members Systems*

*2.1.7 System of remove members.*

## **2.2) The teaching and learning.**

*2.2.1 Management lesson*

- System on / off courses and settings the course as well as permission to attend.
- To add lesson content Courseware, Media File, pdf, etc..

*2.2.2 System test and evaluation.*

- Create a test system.
- Assessment System tests and scoring.

*2.2.3 Promotion of study system (activity).*

- System of the homework and delivered.
- Webboard system.

*2.2.4 Information Management.*

- Add, delete, file management systems (For teachers).
- Add, delete, file management systems (Admin).

## **2.3) Monitoring and reporting system.**

- Shows the number of subjects.
- Shows the number of members.
- Access to display statistics.

In this study the development of management education through the network of higher education. In the name of EasyLMS (<http://EasyLMS.org>) to use of Faculty of Social Technology in Rajamangala University of Technology Tawan-ok Based on the three components of the above so that the system can support teaching and learning through the network.

Steps for Research. This study used Cycle system (Systems Development Life

Cycle: SDLC) as a guide in the design and development, with the following steps.

1. Steps to Feasibility Study were Determined by three factors, namely the technical feasibility, Possible operational and economic feasibility, as well as to study the composition and the ability to work (Features) of management education through the existing network. Study the development of components and the ability of the management system of teaching and learning through networking.

2. Step analysis researchers analyzed the old system and synthesis of model management systems, learning (LMS) from the literature and research related to that system of management education format Free Software and OpenSource Software application software are available from many source. It consists of sources of further development in order to function as needed.

3. Design phase, the process were following system (System Design) suitable for operational environments, economics and technical organizations. Lesson Design (Courseware Design) suitable for learning via the process of research and development by providing a powerful lesson to be effective in accordance with E1/E2 in the development of collaborative research with experts to determine the content learning objectives. The content of tests and activities were design of learning environments on the network (Environment Design) management communication of students and instructors. The user's access of students and instructors were Testing via the students, environment for use of students and instructors in the design and evaluation (Evaluation Design).

4. Steps for development.

*4.1 Hardware development* by providing the server (Server) of a machine equipped with a wired network. Wireless and deployed by Faculty of Social Technology Rajamangala University of Technology Tawan-ok in the first semester of the academic year 2553 to test and modify the system in good condition are available at all times.

*4.2 Software development* is divided into two parts: the operating system is Linux and the

Software Developer Tool used for development is in PHP and primarily using Java Database My SQL.

5. Steps to install Implemented system. Installed to the server (Server) of the Board of Faculty of Social Technology Rajamangala University of Technology Tawan-ok Chanthaburi Campus Preparation for use of the training system used for personnel-related systems.

6. Steps evaluation by introducing improved. To deployment by using the satisfaction of the students, teachers and administrators, network and studied the achievement.

### 3) REFERENCES AND APPENDICES

#### 3.1) References

Distance learning using electronic media via World Wide Web that students and teachers as a channel of communication between students can access many resources existing around the world without limitations. Students can do activities or practice various online using tools that help facilitate the World Wide Web that teaching online is currently is being very popular now because there is no limit on distance, time and place also to respond to potential and abilities of students as well. Concept of e-Learning system is a form that occurs in response to the characteristics of distance learning (Distance Learning) is to reduce the cost of education. The students should study the contents of e-Learning courseware, which means learning to teach the computer that was designed and developed effectively. For use in presenting content knowledge, the content of e-Learning Courseware is divided into lessons. Each lesson will be the concept and purpose of education. The presentation of content teaching and learning activities related resources (Resources) on self-study and then. Students have an obligation to debate and discussions for many problems, as well as with friends, classmates online. Then they are tested to assess the knowledge that students in any class. Paitoon Sefa (2001)

Learning Management System (LMS: Learning Management System) which acts like a center of learning since students began enrolling. The course will be provided Lessons appropriate for learners and deliver lesson content to learners. The system will monitor and evaluate progress notes as well as reports from learning began enrolling students until graduation. In addition, another important element, one of e-Learning content of the lesson is that LMS is not managed in terms of the tools used to create media content for teaching and learning. Sujaree Changcharat.(2002).

#### 3.2) Appendices

Your appendix section should be appeared directly after the Reference section, and should be given an informative title in this format: **Appendix A: Title of Appendix A.**

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University of Technology North  
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## **The Development of a Learning Model through the Royal Thai Air Force Wide Area Network Using the Constructionism for Aircraft Mechanics.**

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### **Abstract**

The purposes of this research were: 1) To construct the Web-based Learning model using the constructionism approach for aircraft mechanics of 601 squadron, Wing 6, Royal Thai Air Force. 2) To find out the efficiency of learning model. 3) To compare the learning achievement posttest scores between traditional group and experimental group. And 4) To study satisfaction toward the web-based learning model that was constructed by the researcher.

There were 3 groups of populations. The first group consisted of 34 administrators on aeronautical engineering field, were selected by the purposive sampling technique. The second groups were 102 of teachers in aeronautical engineering field of aircraft Wing installation that were selected by the purposive sampling technique. The third groups were 60 of aircraft mechanics that divided into traditional group and experimental group all those were used for the target population. Data were analyzed by using mean, standard deviation, and independent samples t-test.

Results of the research were shown as follows : of the Web-based learning model using by the constructionism approach should be included of 8 phases : 1) preparation, 2) studying 3) data collection 4) discussion 5) implementation 6) revision 7) evaluation 8) presentation and knowledge distribution. The efficiency of Web-based learning model using the constructionism approach was 89.26 /

90.66 which follows the criteria. It was found that the post-test scores of experimental group were higher than the post-test scores traditional group at .05 level of significance. The learner of experimental group satisfaction toward the constructed Web-based learning model was at "high" level.

### **Keywords.**

1. Learning Model through RTAF. Wide Area Network (WAN).  
2. Constructionism 3. Internet network

### **Statement of Problems**

1. Aircraft Mechanics are not accustomed to using English text books, so they need translation into Thai.

2. Aircraft Mechanics need to learn more new technology instruction because of the inadequacy of the previous instruction using by transparency sheets. So RTAF. Personnel need to adapt themselves for developing and administrating so as to modernize in line with the forces of globalization.

3. The RTAF. Strategy plan chapter 7 recommended development administration and management systems and development personal of RTAF. To improve efficiency and effectiveness on their job, and also to enhance the basic knowledge for every specific job.



## Research Objectives

1. To construct the learning model for RTAF. Aircraft mechanics
2. To investigate the learning model efficiency.
3. To compare the learning achievement of aircraft mechanics using e-learning through RTAF.WAN and the traditional method.
4. To study of aircraft mechanics satisfaction on the learning model.

## Scope of Study

### 1. Population:

- 1.140 aeronautical engineering administrators
- 1.2 157 aircraft maintenance instructors
- 1.3 60 aircraft mechanics

### 2. Variables:

- 2.1 An independent variable was method of learning with an e-learning model through the RTAF.WAN.
- 2.2 Dependent variables were learning achievement of aircraft mechanics and the satisfaction of aircraft mechanics on the e-learning model.

### 3. Concept of Study:

- 3.1 To determine opinions about and trends of new technology for e-learning model management and structuring.
- 3.2 The role of instructors and administrators in aircraft maintenance management.
- 3.3 The satisfaction of aircraft mechanics with e-learning.
- 3.4 The results of learning achievement of aircraft mechanics by e-learning through RTAF.WAN and the traditional method.

## 3 Phases of Research Methodology

Phase 1 Analysis and synthesis data for learning model design:

- 1.1 Reviewed documents data on the constructionism theory, Web-based learning model through Learning Management System: LMS, including interviewed program website designer and also analysis and then synthesis data on

constructionism theory of Thai and international researches documents.

1.2 Need analysis providing of educational learning system desired on aeronautical engineering field of wing 6 RTAF. The populations consisted of 40 RTAF. aircraft maintenance officers who performed the job duty on the year 2010 and then made a purposive sampling selection to be 34 officers for appropriated number of actual the job duty. Data collection by questionnaires of rating scales.

1.3. The studied of learning factors and roles of instructors toward the new learning model on web networking, the populations for consisted of 157 RTAF. Aircraft maintenance officers and non-officers who performed the job duty on the year 2010 and then made a purposive sampling selection to be 102 officers for appropriated number of actual the job duty in teaching the aircraft system. Data collection by questionnaires rating scales.

The learning model through constructionism of RTAF. WAN providing process; The rating scales questionnaires for aircraft maintenance administrator. And aircraft maintenance instructors for the learning model requirement. Fundamental data of constructionism theory, analysis and then synthesis data on constructionism theory of web and non-web principles illustrated as block diagram as follows:

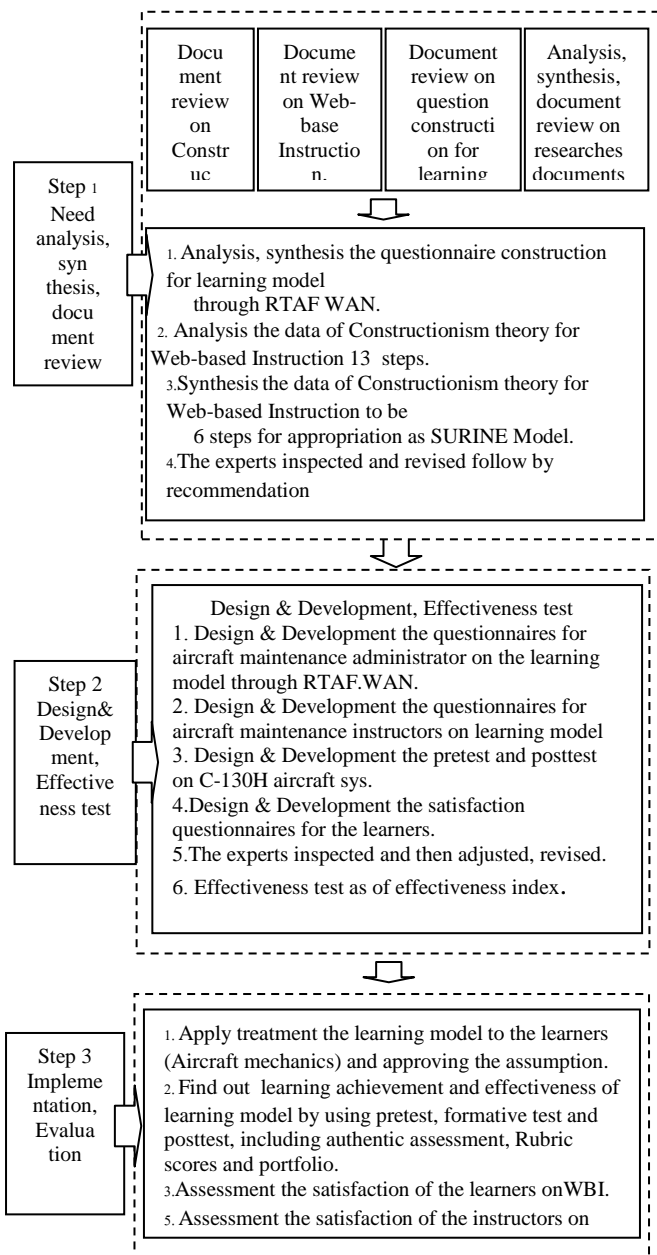


Figure 1 Research frame work

**The tools for step 1**

- 1.The questionnaire construction for learning model through RTAF.WAN.
2. Analysis the data of Constructionism theory for WBI 13 steps.
- 3.Synthesis the data of Constructionism theory for WBI to be 6 steps for appropriation as SURINE Model.
- 4.The experts inspected and adjusted and revised following by their recommendation.

**The research step 2**

Design & development the learning model through RTAF WAN consist of;

- 1.Web-Based Instruction  
URL:<http://www.cte108.net> through RTAF.WAN.
- 2.The learning model assessment form by the educational technology field experts;
  - 2.1. Authentic Assessment and Rubric scores
  - 2.2. e-Portfolio
- 3.Learning achievement pretest & posttest.
4. The questionnaire for aircraft maintenance administrator and instructors.
5. Assessment the satisfaction of the learners on the WBI. through RTAF.WAN.

**The research step 3, treatment for assumption approving**

Proceeding treatment to the sample to approve the assumption:

| Pretest | Treatment | Posttest |
|---------|-----------|----------|
| Tc      | X1        | Oc       |
| Te      | X2        | Oe       |

- Tc Mean Pretest of the control groups.
- Te Mean Pretest of the experimental groups.
- X1 Mean Treatment of the control groups.
- X2 Mean Treatment of the experimental groups.
- Oe Mean Posttest of the control groups.
- Oc Mean Posttest of the experimental groups.

**The conclusion of research step 1**

1. To obtain the taught, principles to construction the draft of WBI. learning model through the constructionism theory and design the WBI.learning activities, learning system and the evaluation.

**The result of research step 2**

2.1 The result of the supporting and appropriated of the development procedure

process factors on step one proceed to be SURINE Model as following:

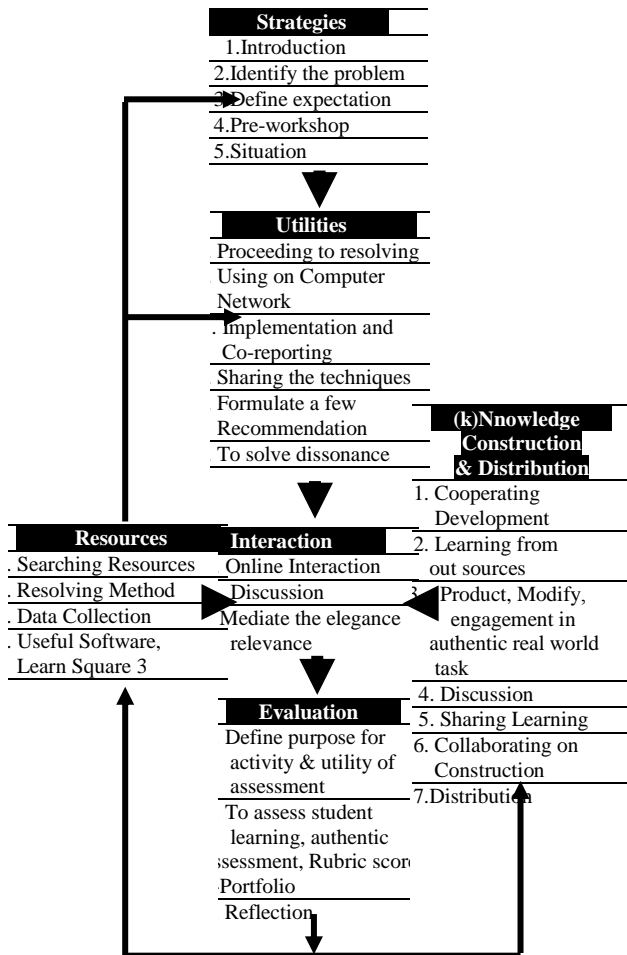


Figure 2 SURIN Model

1. **Strategies** consist of Introduction, Identify the problem, Define expectation, Pre-workshop and situation.
2. **UTILITIES**, consist of Proceeding to resolving, Using on Computer Network, Implementation and Co-reporting, Sharing the techniques, Formulate a few Recommendation, and to solve dissonance
3. **RESOURCES**, consist of Searching Resources, Resolving Method, Data Collection and Useful Software, Learn Square V.3
4. **INTERACTION**, consist of Online Interaction, Discussion and Mediate the elegance relevance.

5. **KNOWLEDGE CONSTRUCTION & DISTRIBUTION** consist of cooperating development, learning from out sources, product, modify, engage in authentic real world task, discussion, sharing Learning, Collaborating on construction, distribution and learner collaboration.

6. **EVALUATION** consist of define purpose for activity & utility of assessment, to assess student learning, authentic assessment, rubric scores, e-Portfolio, reflection and follow up appropriated.

2.2 The result of analysis factors of SURINE Model change to be the activities of learning system as follows:

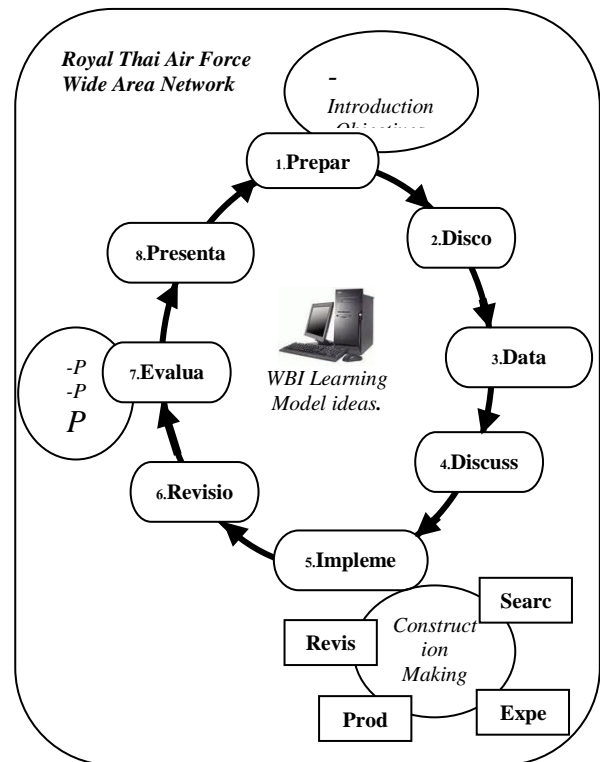


Figure 3 SURIN Model activities.

**The activities of SURINE Model 8 phases detailed as follows:**

- 1 Preparation; The instructor advices classroom, lessons to learn and all tools to learn and practices.
- 2 Studying (Discovery); Discover to the lesson resolving by the constructionism theory.

3 Data collection; to collect to the results of knowledge construction from discovery activities.

4 Discussion and brainstorming; to plan the job construction and production.

5 Implementation; to action on planning jobs by searching, experimental, product and revision.

6 Revision; to review all the jobs are made as the production.

7 Evaluation; to assess the jobs, formative test, posttest, to correct the feedback and report the production.

8.Presentation; to present all the jobs are made, sharing and distribution to the others unit by coordination and collaboration of learning model on constructionism to the RTAF. WAN.

2.3 The result of analysis factors of SURINE Model for effectiveness test and change to be the activities of learning system as following:

2.3.1 Step 1 of the test by the three of aircraft mechanics for effectiveness test on the learning system model and assessment by direct question, observing, interview also revised all the feedback to improve the system learning model.

2.3.2 Step 2 of the test by the nine of aircraft mechanics for quality and effectiveness test on the learning system model for appropriation with the research objectives by performing of treatment on learning model through the aircraft systems subject and performed pretest and posttest questionnaires and obtained  $E_1 / E_2$  as 76.20 / 81.78 and also revised all the feedback to improve the system learning model.

2.3.3 Step 3 of the test by the thirty of aircraft mechanics for quality and on the learning system model for appropriation with the research objectives by performing of treatment on learning model through the aircraft systems subject and took pretest

| Learning achievement | $\bar{X}$ | SD.  | t    | p    |
|----------------------|-----------|------|------|------|
| Experimental groups  | 38.33     | 5.59 | 0.28 | 0.78 |
| Control groups       | 37.90     | 6.22 |      |      |

and posttest questionnaires and obtained  $E_1 / E_2$  as 89.22 / 90.66 and also revised all the feedback to improve the system learning model.

**Table 1** illustrated the analysis learning achievement of experimental and control groups on the pretest treatment. independent

At the table 1 illustrated the learning achievement scores of the experimental and control groups on the pretest treatment of thirty real sample. Found that the control groups received the average scores were 38.33, SD. at 5.59, and the experimental groups received the average scores were 37.90, SD. at 6.22, the “t” index was .28, the “p” index was 0.78 that

| Learning achievement | $\bar{X}$ | SD.  | t    | p      |
|----------------------|-----------|------|------|--------|
| Experimental groups  | 47.50     | 0.97 | 6.64 | .000** |
| Control groups       | 42.77     | 3.89 |      |        |

greater than .05 of assumption index, That’s mean the pretest scores of the control and experimental groups are differential significance.

**Table 2** illustrated the analysis learning achievement of experimental and control groups on the posttest.

\*\* level of significance at .05

At the table 2 illustrated the learning achievement scores of the experimental and control groups on the posttest treatment of thirty real sample. Found that the control groups received the average scores were 42.77, SD. at 3.89, and the experimental groups received the average scores were 47.50, SD. at, 0.97 the “t” index were 6.64, the “p” index was .000 that lesser than .05 of assumption index, That’s mean the posttest scores of the experimental groups higher than the scores of control group or traditional group at.05 level of significance.

3.2 The result of assessment the satisfaction of the learners on the web-based instruction as follows:

The table 3 illustrated assessment the satisfaction of the thirty learners.

| questionnaire listing of satisfaction | X           | SD.         | The level of satisfaction |
|---------------------------------------|-------------|-------------|---------------------------|
| 1.The SURINE model for LMS            | 4.11        | 0.43        | High                      |
| 2.Media for learning activities       | 4.89        | 0.49        | Highest                   |
| 3.The usefulness of learning on WBI.  | 4.33        | 0.54        | High                      |
| <b>Total</b>                          | <b>4.51</b> | <b>0.48</b> | <b>High</b>               |

At the table 3 illustrated the satisfaction behavior of the learners on the web-based instruction, on the Media for the SURINE learning model activities obtained the mean were 4.89 and SD. at 0.49 at the highest level of satisfaction, the usefulness of learning on WBI. of the mean 4.33, SD. at 0.54, at the high level of satisfaction, and the SURINE model for learning management obtained the mean were 4.11, SD. at 0.43 at the high level of satisfaction respectively.

**The total summary of the research;**

1. The learning model construction through RTAF WAN on the constructionism were the research and development education consist of 3 steps as following:

1.1 The process of learning model construction (designs and developments) through RTAF WAN on the constructionism of SURINE Model 6 phases, theirs were:1.Strategies 2.Utilities 3.Resources 4.Interactive, 5. Knowledge Construction & Distribution) 6. Evaluation. The experts provided the recommendation supporting to the process at the high level were 4.51 and SD.at 0.48.

1.2 The experts evaluated the recommendation of SURINE Model consist of 8 phases at the high level, the mean were 4.25 and SD. at 0.70 theirs were:1)Preparation, 2) Discovery, 3) Data collection, 4) Discussion, 5)implementation, 6) Review, 7) Evaluation 8) Presentation.

1.3 SURINE learning model through RTAF WAN on the constructionism provided the effectiveness index at the 89.26 / 90.66.

2. The learning achievement comparison on the posttest between the experimental and the control groups higher than the scores of control group or traditional group at.05 level of significance as of assumption.

3. The satisfaction behavior of the learners' experimental group on the WBI. obtained the total mean were 4.51 and SD. at 0.48 at the high level.

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## **Developing Science Teachers' Understanding Nature of Science through New York Time's Scientist at Work Science Blogs**

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### **ABSTRACT**

Understanding nature of science is a characteristic of scientifically literate person and is an expected competence of all science teachers. This study aims to develop in-service science teachers' understanding of Nature of Science using Scientist at Work, a compilation of science blogs individually written by practicing scientists from diverse fields of natural science, created and maintained by New York Times. The participating teachers (N=22) were pursuing M.Ed. (Science Education) at Kasetsart University and enrolled Nature of Science course taught by the author. This course required them to read the blog, "talk" with the scientist and other peers worldwide over a period of two months in regard to the daily progress of scientific expeditions and on separated report, reflected upon their understanding of what science was and how it worked in context. They worked in a group of three to four and were free to select their favorite scientist. After the online activity, each group introduced their blog and their understanding of Nature of Science as a result of their blog experience to the class. Different aspects of Nature of Science were conceptualized at the end of each presentation through whole class discussion, facilitated by the instructor, in an explicit/reflective manner. To examine the effect of this activity on the teachers' understanding of Nature of Science, Lederman et al.'s View of Nature of Science Questionnaire (Form C) were distributed to the teachers before and after the course. The results

indicated that the blog activity could develop the majority of the teachers' understanding of nature of science in aspects of scientific knowledge, scientific inquiry and scientific enterprise. Most of randomly selected teachers (N=10) for post instruction, in-depth interviews liked this activity and would use it to teach Nature of Science in supplement to in-class science lessons in the future. Reading and writing responses to high quality scientific field notes in form of science blogs in combination of personal and social critical reflection on Nature of Science is an effective way to articulate the true meaning of science.

### **Keywords**

Nature of Science, Science Blogs, Science Teachers, Scientific Field Notes

### **1) INTRODUCTION**

In the current Thai Science Curriculum Framework (MOE, 2001, revised 2008), Nature of Science (NOS) is one of the eight learning strands that must be thought in school science in an integrated way. Science teachers must teach it along with any science content from grade 1 to 12. Teaching nature of science, without doubt, is new challenge and stress to many Thai science teachers. There had never been such learning outcome and requirement in the former science curriculums nor the term nature of science itself. The former curriculums did mention scientific method and suggested teachers to teach science imitating how science is actually done; widely know inquiry-based approach but nowhere mentioned the other aspects of science;

nature of scientific knowledge and scientific enterprise, that comprise NOS. In addition, it had no further explanation with examples on the suggestion to teach NOS in explicit manner. Common misconception about nature of science were clouded in national textbooks and teacher manuals including a classical one like; there is an universal/single route to scientific discovery, experimentation. Unsurprisingly, Thai science teachers' understanding about nature of science is inconsistent with the consensus view of nature of science held the community of practicing scientists and science educators and many teach science but not "about science" in their lesson or went even worse misled it.

With the concern that science teachers' understanding of the NOS less or more influences their actions in classrooms, the author tackled this problem the way he could by designing a learning experience driven a web 2.0 technology, a blog called "Scientists at Work" by New York Time in which learning material; fresh, exciting and authentic expeditions from the fields written and posted regularly the practicing scientists were presented, followed by though provoking questions and comments related to NOS in the text or by viewers that could be anywhere in the world; recorded later used by the author for open and deep discussion in-class about NOS.

## **2) RESEARCH PURPOSE**

To examine the effect of "Scientist at Work" Science Blogs on science teachers' understanding of Nature of Science

## **3) METHODOLOGY**

The author uses an action research as the research design for this project. He taught Nature of Science, a 15-week compulsory course of M.Ed. in Science Education at Kasetsart University. His students were all

in-service teachers. The blog activity lasted for 6 weeks followed by designing a lesson to teach NOS and microteaching sessions which is out of interest of this report.

The students worked in a group of four, selected the blogs written by their favorite scientists from different fields of science including zoology, biogeography, geology, ecology etc. The blog came in various volumes depending on the expedition that could last for several weeks to a year. They were assigned to read and on separate sheet write a summary and reflect the meaning of science behind the adventurous story. They were encouraged to talk to the scientists as well as "friends" from different corners of the world. The conversation can be prompted by questions and comments regarding the investigation and the nature of science. The students were required to hand in the print out of this online dialogue and give an oral presentation of the selected blog and their learning to the class at the end.

The participants' NOS understanding were assessed in a pre/post format using the Views of Nature of Science questionnaire, [VNOS-C] and interviews. This instrument measured the understanding of NOS on the categories with each has different aspects; Nature of Scientific Knowledge (Tentativeness and Laws and theories), Scientific Inquiry (Empirical Basis, Observation and inference, Subjectivity, Creativity) and Scientific Enterprise (Sociocultural Embeddedness). Student's written responses from VNOS-C were thoroughly read and compared with the consensus views of NOS.

## **4) RESULTS**

Some aspects of NOS are not easy to demonstrate in the expeditions. These include: the tentativeness and the durability of scientific knowledge; and the distinction between a theory and a law in science. This finding is in accordance with that of Bell,

Blair, Crawford and Lederman (2003) in that the scientific investigation either in natural setting or laboratory may not provide an opportunity or/and significant time for the readers to explore and interact with these aspects.

However, most aspects of NOS in the categories of scientific inquiry and scientific enterprise are obviously promoted. It was evident that the teachers tasted the messiness and the complexity of scientific investigation from reading the expeditions. The process and the culture of science were portrayed. The blog brings them close as if they engage in the discovery by themselves in an entertaining and educational way. The blog shares thoughts and expertise and provided scaffolding, modeling and coaching in proximity to the teachers. Noted in their reflective journals, reading and writing comments on the blog were impressive and enjoyable. By the end of the blog activity, they have developed the appreciation of science and in turn positive attitudes towards science and science professional.

## 5) SUGGESTIONS

Based on the findings, the suggestions for designing an effective authentic science learning experience to promote the consensus views of NOS are made. An explicit inquiry-based pedagogical approach to teaching NOS should be employed in the blog activity. The blog should not be too short so the teachers could take time to comprehend, familiarize, adjust and become a part of the culture. The explicit approach could have occurred in the seminar that follows blogging in which the instructor pointed out and discussed the aspects of NOS regarding teacher's reflection.

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## Flexible Learning Materials in e-Learning

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The Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH) is primarily concerned with developing innovative and technology-based solutions to address identified educational challenges commonly encountered by Southeast Asian countries. These solutions come in the form of training and human resource development, research and evaluation, and other special programs addressing specific areas of concern in the Southeast Asian educational scenario.

### **FLEXIBLE LEARNING MATERIALS**

Flexible learning materials play a crucial role in the success of *SEAMEO INNOTECH*'s online courses for school principals and managers. These instructional materials enable the learners to acquire the targeted competencies by engaging them in interesting and appropriate activities that support and strengthen the learning process.

Flexible learning materials are instructional materials in print, digital, and web-based modalities that serve to increase the students' control over when, where, how, and at what pace they learn, thus promoting learner autonomy and empowerment.

Using such flexible learning materials, the Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH) has enabled over 3,000 principals and school managers from the Philippines, Thailand, and other Southeast Asian countries since 2006 to

undergo instructional and curriculum leadership training without having to leave their workplaces. This is made possible by enrolling in SEAMEO INNOTECH's LEARNTECH eXCELS suite of online courses. LEARNTECH eXCELS stands for Learning Innovation & Technology Excellence in School Leadership for Southeast Asia. Online courses are conducted through synchronous online chat sessions and asynchronous forum discussions. The discussion topics primarily come from the flexible learning materials developed under the guidance of content experts and instructional designers. These instructional materials provide self-assessment activities before, during, and after studying the material. They also give detailed feedback that reinforces the learning process.

### **WHAT LEARNERS SAY ABOUT SEAMEO INNOTECH'S INSTRUCTIONAL MATERIALS**

In external and internal evaluations conducted on the effectiveness of the LEARNTECH eXCELS courses, a portion of the instruments focused on the flexible learning materials. Over-all results showed that the respondent school leaders rated the instructional materials as very useful and effective (Mean= 3.78, Very effective).

For the qualitative part, comments may be summarized as follows:

- The primary strength of the flexible learning materials is the richness of the content in terms of school leadership.

- The instructional materials enable the learners to understand the various theories on school leadership and management
- Providing hardcopies of the instructional materials was an excellent move, especially for learners who don't have laptops or other mobile devices
- The instructional materials enable a self-study program using well-prepared modules.

The positive evaluation results point to the effectiveness of the learning materials and their instructional design for e-learning.

Key to the effectiveness of the self-instructional flexible learning materials are the instructional design based on the 4 A's of adult learning and active learning principles.

#### THE 4 A'S OF ADULT LEARNING

1. **Activity:** Describes the structural experiences designed to engage the learner in activity dealing with the concepts to be learned. The experiences may be:
  - direct or vicarious
  - case analysis
  - questionnaires to be answered
  - simulation exercises
  - personal disclosure sessions
2. **Analysis:** Describes the process of inquiry into the results of the Activity. It includes:
  - What questions are to be raised?
  - What data will surface?
  - How will personal insights be evoked and processed/discussed?

3. **Abstraction:** Describes the generalization that will/can be derived from the Activity and Analysis. In this portion, theory input(s), lecturettes, or other activities may be included to explain or recapitulate the various concepts covered in the learning episode.
4. **Application:** Provides activities which will enable learners to transfer concepts learned to real life situations.

Provides mechanisms by which learner is able to evaluate his/her attainment of the instrumental (learning content) and the terminal (behavioral) objectives. These may include the following:

- Action plans
- Assignments
- Evaluation activities/ instruments to check understanding of/commitment to the learning outcome

The 4 A's engage the learners in activities that cater to their various learning styles, higher order thinking skills, and application of the concepts learned in the context of their workplaces as school leaders.

#### ACTIVE LEARNING PRINCIPLES

Active learning involves building interactivity into learning materials in order that learners are *doing something* with the ideas they are learning about and are actively involved in a two-way dialogue with the writer's text.

## WHAT IS THE PURPOSE OF ACTIVE LEARNING?

It helps learners to:

1. Find a pathway through the learning material
2. Break the text into manageable learning chunks
3. Maintain their interest and motivation
4. Remember, understand and make use of the ideas and information encountered
5. Think for themselves
6. Learn by doing
7. Go beyond memorization
8. Draw inferences
9. Relate and apply their learning to their own work or personal life
10. Bring in their own experience and examples
11. Reflect on implications of their learning
12. Practice towards important objectives
13. Monitor their own progress
14. Identify their strengths and weaknesses
15. Gain feedback on their learning performance
16. Pause and make mental notes of important information
17. Keep a record of what they have done

## HOW TO BUILD INTERACTIVE LEARNING INTO THE INSTRUCTIONAL MATERIALS

1. Guided Interaction
2. Activities
3. Feedback
4. Examples

### 1. GUIDED INTERACTION

Flexible learners need guidance in moving through a self-instructional learning material in order to maintain their motivation and make sense of the content, activities and assessment tasks.

This guidance is provided by four key elements of flexible learning materials:

- a) Learning Outcomes/Objectives
- b) Advance Organizers
- c) Access Devices
- d) Interactive Dialogue

#### a) **Learning Outcomes/Objectives tell learners –**

- what they are going to do and where they are headed
- what they have achieved
- what they've yet to master

They help module writers decide –

- what to put into the materials
- how to structure the content
- what assessment tasks to use

#### b) **Advance organizers are statements or symbols which indicate to learners what is coming next and help them organize their learning.**

Examples:

- a contents list
- diagrammatic representation of a module structure
- statements of aims and objectives
- introduction
- icons
- verbal signposts

- c) **Access devices are guides to learners which help them to move through the text. They provide signposts and highlight important information.**

Examples:

- links with other materials
- guidance on how to use the material
- pre-test
- labels to highlight important elements of illustrations, tables
- summaries/recaps
- graphic symbols, icons or cues

- d) **Interactive Dialogue is the manner with which the writer should talk to the learner in a friendly and encouraging dialogue.**

Examples:

- Use personal references (I, you, we).
- Engage the learner in an on-going dialogue/conversation
- Give advice on what to do and how to do it
- Give reinforcement and praise
- Provide bridges or links from one topic to the next, e.g, In the last lesson we learned

- Give clear instructions for all activities
- Use analogies that touch on a shared everyday experience
- Write in a relatively informal, user-friendly style
- Use language that is closer to everyday conversation
- Cut out surplus words , e.g, not “at the present moment in time” but “now”
- Use short (and usually more familiar) words) e.g., “use” not “utilization”

## 2. ACTIVITIES

Activities are the essential learning ingredient of active flexible learning materials.

Activities require learners to DO SOMETHING with the ideas they are learning about.

- a. **Questions or activities embedded in the material** every few minutes inviting the learner to answer a question or do some activity before continuing.
- b. **Assignments or projects** (often for assessment by a tutor) that are to be tackled after perhaps many hours of work. Usually used for assessing learner

achievement and encouraging application of learning to real life situations.

SEAMEO-INNOTECH Research Studies Unit (2009, 2010, 2011). Evaluation Reports.

3. **REGULAR FEEDBACK** is essential for learners to assess the adequacy of their responses to questions, activities, assignments, and overall learning progress.

Feedback in the text is the written equivalent of face-to face discussion in a conventional classroom or training session. It is not just about right and wrong answers. It is an integral part of the teaching-learning process itself.

4. **EXAMPLES** are needed to bring ideas and concepts to life and make them meaningful for learners

Examples build on the known in order to explain and explore the unknown. They provide a springboard for activities and interactive dialogue

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## Development of e-Learning Instructional Materials for the ICNS152 Southeast Asia Ecology Course

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### ABSTRACT

**Electronic learning or e-Learning instructional materials were developed for the ICNS152 Southeast Asia Ecology course, a natural science course offered at the Mahidol University International College, Thailand. The course provides an overview of the ecological systems of Southeast Asia and the current impacts and potential threats to them; the protected area system and their roles in protecting intact ecosystems, in conserving biological diversity, in providing ecological services, and as a key component of ecotourism; and the course looks at the relationship between ecosystem protection and sustainable development, and the international conventions that relate to ecosystem protection. The nature and scope of the course and the diversity of topics and sub-topics offered therein therefore allows for numerous opportunities in the development of e-Learning instructional materials for the course, and some of these are presented here.**

### Keywords

e-Learning, instructional materials,  
Mahidol University International College,  
Southeast Asia Ecology

### 1) INTRODUCTION

Electronic learning or e-Learning typically comprises all forms of electronically and technologically supported information and communication systems meant to serve as one means of implementing the learning and teaching processes, which can be employed for the out-of-classroom situation at both the learners' and the

teachers' convenience, and for supporting or enhancing the learners' in-classroom educational knowledge acquirement and experiences. In addition, the development of e-Learning has allowed knowledge to be accessed by a wider group of audience, beyond those typically associated with educational institutions.

### 2) BACKGROUND & OBJECTIVES

Hence, in line with Mahidol University's vision and policy towards the provision of knowledge-based services, instructional materials for the *ICNS152 Southeast Asia Ecology* course, a General Education natural science course offered to the undergraduate students of Mahidol University International College (MUIC), were developed with the following objectives and justifications:

- i. To allow students registered for the *ICNS152 Southeast Asia Ecology* course to access, review, and revise the course contents at their convenience from any location, and to reduce the time required for effective learning, therefore improving flexibility of the course delivery.
- ii. To motivate student learning, as e-Learning can be an effective means to keep abreast of articles on recent findings and observations, new technology, and to keep the learners inspired and encourage them to generate new ideas.
- iii. To allow learners to have a better understanding and appreciation of the natural and human-modified ecosystems, the threats they are facing,

benefits of the ecosystem services to humans, and the relationship between ecosystem protection and sustainable development.

- iv. To allow the public (students and non-students) access to interactive user-friendly educational materials that would otherwise be beyond their time availability and more importantly, beyond their economic means (e.g., school fees, tutor costs, travelling costs, costs of printed materials).

The overall purpose of the *ICNS152 Southeast Asia Ecology* course is to offer an overview of the ecological systems of Southeast Asia, and to discuss the current impacts and potential threats to them. The course further looks at the protected area system and its role in protecting intact ecosystems, in the conservation of biological diversity, in providing ecological services, and as a key component of ecotourism. In addition, the course looks at the relationship between ecosystem protection and sustainable development, and the international conventions that relate to ecosystem protection. Finally, the course provides some eco-friendly guidelines for developers and planners.

### 3) COURSE OUTLINE AND e-LEARNING CONTENT DESIGN

The nature and scope of the *ICNS152 Southeast Asia Ecology* course and the diversity of topics and sub-topics offered therein (table 1) therefore allows for numerous opportunities in the development of e-Learning instructional materials (table 2) for the course. To develop all possible e-Learning instructional materials for the course would require much time, effort, and funds. Thus, the development of e-Learning instructional materials for the course will be feasible only when carried out in several phases. For the first phase, the aspects of the topics and sub-topics

selected (table 2) are described in the following section.

Table 1: ICNS152 Southeast Asia Ecology course outline

| <i>Week</i><br><i>k</i> | <i>Topics</i>  |
|-------------------------|--|
| 1                       | <ul style="list-style-type: none"> <li>• Introduction to Southeast Asia</li> <li>• Introduction to Ecology</li> </ul>  |
| 2                       | <ul style="list-style-type: none"> <li>• Ecological Overview of Southeast Asia</li> </ul>  |
| 3                       | <ul style="list-style-type: none"> <li>• Natural Ecosystems: Mangrove Forest, Beach Vegetation, Brackish-water Forest, Rocky Shores, Coral Reefs</li> </ul>                    |
| 4                       | <ul style="list-style-type: none"> <li>• Natural Ecosystems: Rivers and Lakes, Peat swamp Forest, Freshwater-swamp Forest</li> </ul>   |
| 5                       | <ul style="list-style-type: none"> <li>• Natural Ecosystems: Lowland Forest, Mountains, Caves</li> </ul>   |
| 6                       | <ul style="list-style-type: none"> <li>• Mid-term Examination</li> <li>• Man-made Ecosystems: Impacts and Threats</li> </ul>   |
| 7                       | <ul style="list-style-type: none"> <li>• Man-made Ecosystems: Agricultural Ecosystems, Urban Ecology</li> </ul>  |
| 8                       | <ul style="list-style-type: none"> <li>• Protected Areas: Definition, Concept and Categories</li> </ul>  |
| 9                       | <ul style="list-style-type: none"> <li>• Biodiversity Conservation</li> <li>• Ecosystem Services</li> </ul>  |
| 10                      | <ul style="list-style-type: none"> <li>• Sustainable Development</li> <li>• Ecotourism: Definition and Concept</li> </ul>  |
| 11                      | <ul style="list-style-type: none"> <li>• International Conventions and Ecosystem Protection</li> <li>• Ecologically-friendly Guidelines for Developers and Planners</li> </ul> |



Table 2: Content design of instructional materials

| <i>Instructional Materials</i>                     | <i>Purposes</i>  |
|--|--|
| 1.1 Animation of the SE Asia                       | <ul style="list-style-type: none"> <li>To allow geographically challenged learners to better able locate countries in SE Asia and in the ASEAN.</li> <li>To allow learners to better able distinguish SE Asia as a biogeographic region as opposed to the member countries that make up ASEAN.</li> </ul>  |
| 1.2 Animation of ASEAN                             |  |
| 1.3 Animation of SE Asian and ASEAN's forest cover | <ul style="list-style-type: none"> <li>To allow learners to obtain a better overview of the forest types and their distribution, and the extent of forest cover in SE Asia and the ASEAN member countries.</li> <li>To allow learners to obtain a better visualization of the loss of forest cover and to emphasize the need for protect the remaining forests.</li> </ul> |

2.1 Animation of the mangrove forests.

- To assist learners in visualizing mangrove forest ecosystems and the unique environmental conditions with which they are associated.
- To allow learners to understand the physiological adaptations that mangrove plant species have adopted to survive the harsh environmental conditions of the coastal areas.

2.2 Animation of vivipary and seed dispersal by water.

- To illustrate a unique form of germination observed in some mangrove plant species.
- To illustrate seed dispersal by water, and a species' unique strategy for survival.

2.3 Animation of an ecological service provided by the mangrove forest ecosystem.

- To illustrate some of the physical functions of the mangrove forest ecosystem in fulfilling the role of buffering the impacts of waves, storms, and tsunami.

- 3.1 Short video clips of some of the components of the lowland forest ecosystem and protected area management.
- Video clips accompanied by the course instructor's commentary, to illustrate some of the salient features of the lowland forest ecosystem, threats, and impacts they are facing and some to the issues related to protected area management.
- 3.2 Animation of the fig wasp cycle and fig pollination by fig-wasps and figs.
- To illustrate the fig-wasp cycle, fig pollination, and the unique mutualism exhibited between fig wasps and fig species.
- 3.3 Animation of the modes of coexistence among wildlife species occupying the tropical lowland forest ecosystem, and details of the wildlife species exhibited in the animation.
- To illustrate the specializations and strategies that wildlife species adopt that enable them to coexist at high densities and diversity in an intact tropical lowland forest ecosystem.
  - To provide detail descriptions of the wildlife species illustrated in the animation, and these include the species' taxonomic notes, global threatened status, geographic range and distribution map, population status, habitat and ecology, and threats to their survival.

- 3.4 Multimedia slideshows of students' field trips.
- To allow learners a lighthearted view and a record of their field trips to a lowland forest ecosystem.
- 

#### 4) THE OUTPUTS

##### 4.1) Introduction to Southeast Asia, ASEAN, and ASEAN's forest cover

###### 4.1.1) SE Asia

The SE Asia is a sub-region in Asia that is geographically south of China, east of India and north of Australia. This sub-region can be further categorized into the Asian mainland, and the island arcs and archipelagoes to the east and southeast. The animation starts with an illustration of the planet Earth and the regions therein, followed by an illustration of the SE Asia as a biogeographic region.

###### 4.1.2) ASEAN

The Association of Southeast Asian Nations or ASEAN was established on 8 August 1967 in Bangkok by the five original Member Countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand; and later joined by Brunei Darussalam, Lao PDR, Myanmar and Cambodia. The animation similarly starts with an illustration of the planet Earth and the regions therein, followed by an illustration of the ASEAN member countries.

###### 4.1.3) Forest Cover

As above, the animation begins with an illustration of the planet Earth and the regions therein, followed by an illustration of the countries in and adjoining SE Asia. Users are able pan around the region or zoom in to a particular area for more detailed information. The forest cover also shows the forest types found in the region.

## 4.2) Mangrove forest ecosystem

### 4.2.1) Mangrove Forest Ecosystem

The mangrove ecosystem is a very distinct ecosystem that occurs in saline coastal habitats primarily in the tropics and subtropics, frequently near the mouths of large rivers and in sheltered bays (Whitten *et al.*, 1987; Osborne, 2000; Giesen *et al.*, 2007). The mangrove ecosystem is generally restricted to the tidal zone i.e. the area on the coast from the lowest water level up to the highest high water level (Whitten *et al.*, 1987; Osborne, 2000).

The mangrove vegetation include trees, shrubs, ferns and palms that typically grow in extreme environmental conditions, that include soils with low oxygen content, salinity and frequent tidal inundation. However, the mangrove vegetation have developed a set of physiological adaptations to survive the problems of low oxygen content, muddy, shifting, saline conditions (Whitten *et al.*, 1987; Osborne, 2000; Giesen *et al.*, 2007).

Given frequent or permanent inundation, mangrove trees therefore need to keep their trunks and leaves above the water line, while simultaneously firmly attached to the ground so they will not be dislocated by the waves (Whitten *et al.*, 1987; Osborne, 2000; Giesen *et al.*, 2007). Mangrove trees have special aerial roots, pneumatophores, and salt-filtering taproots that enable them to thrive in the muddy and saline conditions (Whitten *et al.*, 1987; Osborne, 2000; Giesen *et al.*, 2007). Aerial roots and pneumatophores project above the mud and water in order to absorb oxygen from the environment. The parts of a root that appear above the waterline then transfers oxygen to the plant below the waterline. The aerial roots, pneumatophores, and taproots can filter out the salt from the saline/brackish water. A number of mangrove plant species possess stilt and buttress roots to improve stability in the

soft and unstable muddy substrate.

The animation illustrates some features of the mangrove forest ecosystem, such as its location along the estuaries, the inundation it regularly encounters, and its specially adapted roots. The animation further illustrates vivipary and seed dispersal by water, and a physical function of the mangrove ecosystem.

### 4.2.2) Vivipary and Seed Dispersal

Vivipary is a unique feature of the mangrove vegetation that characterizes many typical mangrove tree genera, such as *Avicennia*, *Bruguiera*, *Ceriops* and *Rhizophora* i.e. the seeds germinate while still attached to the mother plant (Osborne, 2000; Giesen *et al.*, 2007). Mangrove plants that exhibit vivipary can disperse their seeds by water, and plants dependent on water dispersal will have fruits or seeds that can float. These fruits/seeds can disperse over long distances, and will usually germinate upon reaching shallow waters or when in contact with a firm substrate.

Seed dispersal can be viewed as means of ensuring reproductive success by reducing intra-specific competition for resources, and by reducing chances of being predated upon (Whitten *et al.*, 1987). Seeds of different plant species can develop different strategies for dispersal, such as dispersal by an explosive mechanism or by wind, water or animals (Whitten *et al.*, 1987; Whitmore, 1998; Richards, 1996).

The animation illustrates vivipary as exhibited by some mangrove vegetation, and illustrates how the germinated seeds attach themselves onto the soft muddy substrate and develop into saplings. The animation further illustrates seed dispersal by water by those species that exhibit vivipary. Controls allow e-Learning users to pause and mute the animation.

#### 4.2.3) *Buffer against Waves and Storms*

The mangrove ecosystems serve many important functions, directly and indirectly beneficial to humans. These functions can be broadly grouped into physical, biological and commercial (Whitten *et al.*, 1987; Osborne, 2000; Giesen *et al.*, 2007). Among the many physical functions of the mangrove forest ecosystem is that it serves as a buffer against extreme natural events. Its roots and trunks slow the water's flow preventing or reducing impacts from wind action, wave action, storm, hurricanes, and tsunamis in coastal areas, minimizing damage to property and the loss of life.

The animation shows the impacts of tsunami on coastal areas in the presence and in the absence of an intact mangrove forest ecosystem. Controls allow e-Learning users to pause and mute the animation.

#### 4.3) Lowland rainforest ecosystem

##### 4.3.1) *Aspects of the Tropical Lowland Forest Ecosystem*

A tropical rainforest flora is characterized by an abundance of thick climbers, vines and epiphytes; a closed canopy formed by broadleaf evergreen trees, large buttressed trees, and tall smooth-barked trees; a relatively open forest floor, and comprising mainly small trees and herbs (Whitten *et al.*, 1987; Richards, 1996; Whitmore, 1998). The high plant diversity in tropical lowland forests is due to a number of factors that include varying levels of light, humidity, temperature, higher nutrients, rapid decomposition, and rainfall. In turn, the high animal diversity is associated with the structural and taxonomic heterogeneity of the plants (Whitten *et al.*, 1987; Richards, 1996; Whitmore, 1998).

Video recordings of actual field trips to the lowland forest ecosystem were made. These recordings were later edited to

comprise several short video clips of about three minutes in duration to illustrate a particular aspect of the lowland forest ecosystem, and some observable biodiversity conservation and ecosystem management and issue. The video clips allow e-Learning users to directly access and view a particular aspect of the lowland forest ecosystem.

##### 4.3.2) *Figs and Fig Wasps*

Figs, in addition to being keystone resource for forest animals and humans, are one of the most interesting groups of plants (Whitten *et al.*, 1987; Whitmore, 1998), being widely distributed throughout the forests and available all the year round, with one fig plant or the other fruiting at any given time. The fig fruit, although ecologically considered a fruit, is actually a syconium, an inflorescence whose walls arch over and around so that the inflorescence is somewhat enclosed (Whitten *et al.*, 1987; Richards, 1996).

The fig plant has unique form of pollination. Its flowers are exclusively pollinated by tiny fig-wasps, with both figs and wasps totally dependent on one another for their survival. Furthermore, one species of fig-wasp is generally specific to a species of fig plant (Whitten *et al.*, 1987; Richards, 1996). The pollination process starts with the development of the flowers, which attract the female wasps. One or more female wasps enter the fig and each female wasp deposits her egg, and in the process 'unintentionally' collects pollen, which are then transferred to another fig, and the process is repeated several times (Whitten *et al.*, 1987). The larvae develop and pupate, the male pupae search for the female pupae and fertilize them, and upon maturity, the impregnated female wasp flies out and repeats the process (Whitten *et al.*, 1987).

The animation illustrates the fig wasp cycle, and the animation is subtitled to describe particular segments of the cycle. The animation has a pause control that allows e-Learning users to view the animation at their pace.

#### 4.3.3) *Modes of Coexistence*

The tropical lowland forests in addition to exhibiting a high density and diversity of plants also exhibit a high density and diversity of animals, more than any other terrestrial ecosystem. In addition, studies in the tropics have shown how so many animals can coexist in the same forest, primarily because different species occupy different niches, although the niches may overlap to varying degrees. These modes of coexistence include specialization in space, diet, and breeding sites (Whitten *et al.*, 1987; Whitmore, 1998).

The animation on co-existence of tropical wildlife allows e-Learning users to view and understand how diverse animal species can coexist in the same intact tropical lowland forest ecosystem, by developing specializations to exploit one or more ecological niches. A number of controls accompany this animation to illustrate the vertical stratification of a typical lowland forest ecosystem, and to illustrate animal species' specialization in space, in diet, and in breeding sites, photographs of the animals, and the animal's details from the IUCN Red List of Threatened Species database (to include information on the animals' taxonomic notes, global threatened status, geographic range and distribution map, population status, habitat and ecology, and threats to their survival).

## 5) CONCLUSION

The e-Learning instructional materials allow users to access, review, and revise the materials at their convenience from any location. Instead of being viewed as a replacement to traditional modes of teaching, the e-Learning instructional materials reinforce the course's teaching and learning. In addition, preliminary observations and opportunistic qualitative assessment indicated that registered users have much benefitted from the e-Learning instructional materials for the ICNS152 Southeast Asia Ecology course, and the instructional materials have indeed reinforced the users' learning and understanding of the course.

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## **e-Learning Courseware Prototype for Information Literacy Competency Development of Undergraduate Students**

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### **ABSTRACT**

This research aimed to develop an e-Learning courseware prototype for information literacy development of undergraduate students. The research based on the following concepts and theories: information literacy competency standards for higher education, theory of constructivists, ADDIE model for courseware development, and instructional design using the learning activity management system (LAMS). The research method used was a research and development approach used was a research and development approach which comprised of 5 steps: 1) the analysis and development of course plan for information literacy instruction which appropriated for e-Learning systems, by using documentation research survey method. 2) Instruction design based on the theory of constructivist and LAMS's tools. 3) Development of e-Learning courseware by using LAMS's software. 4) Testing and evaluation of the courseware, done by Khon Kaen University's first year students of class 000130 information Literacy Skills, course teaching staff, and e-Learning experts. 5) Development of the completed courseware for the information literacy course.

The research results provided the following products: 1) Course plan for information literacy instruction at undergraduate level which evaluated by the experts as appropriated for e-Learning system (IOC ) 0.8). The details of course plan included

information literacy competency expected from the course learning, topics and synopsis of the course contents, learning and teaching activities based on the theory of constructivist, student's roles, teacher's roles, and the measurement and evaluation of the learning outcomes. 2) An e-Learning courseware prototype for information literacy development of undergraduate students which has been developed by using LAMS software and tested and evaluated by the students, teaching staff, and e-Learning experts. The courseware evaluation was rated at good and very good levels in all items in the following aspects: course contents, learning activities, multimedia elements, measurement and evaluation of the learning outcomes, course management, and the system performances. It is suggested that implementation of this courseware prototype in an institution is based on the following factors: policy of institution on the development of information literacy competency of its students, infrastructure of information technology for supporting e-Learning instruction, the readiness of teaching staff and students and their skills in using e-Learning for learning and teaching, and the availability of learning resources in accordance with the course contents which will enhance the students' learning and then enable to development the students' competencies according to the course objectives.

## **Keywords**

e-Learning courseware; Information literacy; competency development; undergraduate students

## **1. INTRODUCTION**

Information Literacy is a basic characteristic needed and important skill of the knowledge-based economy. It was one major mission of Higher education to improve student to be information literate person. (Dewald & Scholz-Crane, 2000)

e-Learning is an innovation of teaching and learning. (Soh, Park & Chang, 2009)

In other parts of the world, e-Learning bring to a number of class by subject and curriculum. While in Thailand, e-Learning tends to supplement on campus classroom. (Laohajaratsang, 2008; Pongpech, 2005)

Most literature about information literacy teach in higher education in foreign are teach information literacy in class while student can revisable lesson by content online. In Thailand, almost teach in class more than on network. The larger port of contents do not cover a set of information literacy competency. In instruction, almost instruct in theoretical teaching more than Practical teaching. Other than that, most of them have a problem of increase student while instructor to be the same. While trend of development on information literacy instruction must be cover to comprehensive replacement. So student can self-directed learning all of subject by online. (Tuamsuk, 2010)

Because of higher education must be improve students' information literacy skill in order to be improve graduate student quality, apply to work and lifelong learning. However, developments of information literacy skill instruction by teach only in class. Because of the increasing number of students. Development of information literacy instruction by e-Learning instruction should be good answer and in accord with need to develop technology skill.

So development of e-Learning courseware prototype for information literacy competency undergraduate students with system methodology, including with academic matter of information literacy standard, instructional theory for learning development and e-Learning principle, to be important issue, lead to benefit for higher education and bring to common scholastic.

## **2. RESEARCH OBJECT**

This research aimed to develop courseware prototype for instruction by e-Learning as a guide line for developing information literacy competency of undergraduate students.

## **3. CONCEPTUAL FRAMEWORK**

3.1 Information Literacy Competency : by analyzing information literacy standard of SCONUL (1999), ACRL (2000) and ANZIIL & CAUL (2004) and groups of similarly standard, arrange words to be easy understand and appropriate language. Result to be framework of 5 information literacy standards.

3.2 Instructional Design to use constructivist theory with 4 elements; 1) Problem Base by students create project to be information study case. 2) Information Resources by make contents to be information resources online. 3) Scaffolding by student who's has a question can immediately connect for help from instructor. 4) Collaborative Learning by student must joint to group project for display idea and comment other opinion. (Kammanee,2008;Lomabut,2005; Maneerattanarungroj, 2007)

3.3 Design and Development Process : Use ADDIE Model consist of 5 step; 1) Analysis related contents such as information literacy contents, structure of course contents, elements of lesson, measurement and evaluation. 2) Design structure of lesson only such as screen, practice and test, lesson contents. 3)

Development of Courseware prototype by developing contents, practice, test and have a test and recheck all of courseware. 4) Implementation courseware by experimental group of student and instructor for improve courseware before actual implement. 5) Evaluation for suitability of apply from project objective. (Molenda, 2003)

3.4 Courseware development by LAMS software (Learning Activity Management Systems) with activities tools for manage sequences of learning activities. (Dalziel, 2007; Ghiglione & Page, 2010)

#### **4. RESEARCH METHODOLOGY**

This study used R&D approach which comprised 5 step

1. Analysis and Develop for course plan and course contents of information literacy course of undergraduate students and appropriate for instruction in e-Learning with documentary research and survey research. Start at analysis and synthesis information literacy standard for higher education. Then define to course plan consist of information literacy competency, topic of contents, learning activity, teacher activity, student activity, measurement and evaluate of outcome learning. Next to survey of 5 information literacy experts and 15 information literacy lecturers for evaluate course plan. A questionnaire is a research instrument.

2. Instructional design by documentary research. By improve course plan according to counseling expert. Then bring to learning activity design by constructivist theory. Then manage the learning activity by using LAMS tools.

3. Courseware prototype development by developmental research. First, choose learning unit 1 and 2 of instruction design to manage by LAMS tools. Then test for LAMS system and test for learning online by define to supplementary learning online.

4. Testing and Evaluating of the Courseware with survey research. Take courseware unit 3 and unit 4 to test in

comprehensive replacement media by 30 first-year undergraduate students of Khon Kaen University of class '000 130 Information Literacy Skill' and instructor of '000 130 Information Literacy Skill' for 1 person. Then evaluate courseware by student, instructor and e-Learning experts with questionnaire. Method of evaluate by survey and user experiences.

5. Develop e-Learning courseware prototype for information literacy development of undergraduate students to all of 6 units.

#### **5. CONCLUSION**

##### **5.1 Result of development of e-Learning courseware**

Research result can be described as follows

1) Development of contents and information literacy competency consist of 2 parts as follows

1.1) Information literacy competency compose of 6 competencies, each competency comprise of knowledge and skills.

1.2) Topic of contents and main point of contents compose of 6 units as follows Unit 1 Information Literacy and Higher Education, Unit 2 Analysis of information needs, Unit 3 Selection to Information Sources and Information Resources, Unit 4 Information Search, Unit 5 Information Evaluation and Unit 6 Composer and Information Present.

2) Courseware plan Development. Each of courseware plan compose with 4 parts as follow; learning activities, teacher activities, student activities, measurement and evaluate.

3) Appropriate Evaluation of Course Plan

3.1) Content and Information Literacy Competency was received IOC (Index of Consistency) >0.8 by information literacy experts with in each of contents items and competency issues.

3.2) Course plan for information literacy instruction at undergraduate level in each unit was verified by information literacy



experts using the index of congruence (IOC > 0.8)

### 5.2 Result of Instructional Design

**Table 1** Example of instructional design of learning unit 3

| (Learning & Teaching Activities)   | (Constructivist)            |
|--|-----------------------------|
| <b>Competency 3</b> Selection of Information Sources and Information Resources<br>Knowledge – Defines and articulate type of information sources and information resources<br>Skill – Determines information sources and information resources for appreciated information needs |                             |
| <b>Learning Unit 3</b> Selection Information Sources and Information Resources   |                             |
| 1. Learning Object Description   | - Problem Base              |
| 2. Topic   | - Information Resource      |
| 2.1 Information Sources<br>- VDO and Contents online   | - Information Resource Game |
| - Information Resource Game  | - Strategic Scaffolding     |
| 2.2 Information Resources<br>- VDO and Contents online   | - Information Resource      |
| - Information Source Game  | - Strategic Scaffolding     |
| 2.3 Information Sources and Resources<br>Selection<br>- VDO and Contents online  | - Information Resource      |
| - Information Resource Game  | - Strategic Scaffolding     |
| 3. Individual Exam: Learning and Understand Information Sources at Real Information Sources.   |                             |
| 4. Individual Exam: Determines Information Sources and Information Resources for appreciated information needs   |                             |
| 5. Group Project : Selection Information Sources and Information Resources for appreciated information needs<br>6. Collaborative opinion and evaluative result of group project.   | - Collaborative Learning    |
| 7. Post test   |                             |
| 8. Learning Note   | - Metacognition Scaffolding |

### 5.3 Result of development an e-Learning courseware prototype for information literacy competency development of undergraduate students.

Researcher was develop an e-Learning Courseware prototype in 3 step as follow

1) Development Courseware unit 3 and unit 4. Chose courseware unit 1 and 2 for Learning Management System test and try out of learning online by student. The 30 Students of 000130 was surveyed opinion. Result of test was LAMS system can operate on Windows NT server Operating System and result of survey is students can learning online. Then develop courseware unit 3 and 4 to complete and let students to comprehensive replacement learning.

2) Evaluation of Courseware Prototype. Courseware unit 3 and unit 4 was evaluated by 3 types; 1) Portfolio Analysis find unit 3 had students to learn 25 persons (83.33%) and unit 3 had students learn 16 persons (53.33%). 2) Surveys and evaluation of courseware at issue; Course contents, Learning Activities, Multimedia Elements, Measurement and Evaluation of Learning Outcomes. Student and e-

Learning Expert had commented to courseware was a very good and good appropriate. 3) Students who use courseware (user's experiences) commented that the courseware was easy to use.

## 6. DISCUSSION

This develop an e-Learning courseware give precedence to information literacy standard of higher education be universality. Begin with analyze and synthesis information literacy standard of SCONUL (1999), ACRL (2000) and ANZIIL & CAUL (2004) which are well-known and accept in higher education around the world as well as Thailand (Tuamsuk, 2010); besides, courseware prototype as for contents and information literacy competence are assign on learning competency for KKU's Graduate Qualifications Framework. (Khon Kaen University Council, 2010) Courseware prototype consist of instructional activities, teacher activities, learner activities and measurement and evaluation. Which define to analyze and synthesis related document of 000130 Information Literacy Skill, so expert evaluate appropriate (IOC) of courseware plan at >0.8 in each items and evaluate appropriate (IOC) at 1.00 in 4 courseware (unit 2, 3, 4 and 6)

Instructional design found to use constructivist theory in develop e-Learning courseware had 4 components as fellow; problem base, information resources, strategic scaffolding and collaborative learning. Result to evaluate by student are give an opinion of learning activities according by constructivist theory are good in each activities, also information literacy expert comment to learning activity of problem base which according to lesson, learning activity which support to information recourses by self-learning are very good activities. While learning activity by collaboration and learning activity support learner to give an opinion are good activities. This are indication to

use constructivist theory in develop e-Learning courseware are appropriation both theory and practice.

Develop an e-Learning courseware by LAMS system cause to e-Learning courseware which include components of learning activities management system; result to experts and students evaluate LAMS system are good and very good for course management.

## **7. RECOMMENDATIONS AND PERSPECTIVES FOR POSSIBLE FUTURE WORKS**

1. Higher education can apply by (1) Training staff or student for develop information literacy through e-Learning system. (2) Intervention in others subject for develop information literacy of student by defines student to self-learning in e-Learning system. (3) Use as both comprehensive replacement media and supplementary media for decrease instructional problem in case a great number of students. Higher education should consider factor of 1) Policy of institute to give precedence to develop information literacy is one point of desirable featured graduate. 2) IT infrastructure has computer laboratory for 24x7 service, LAMS software, Staff for develop instructional media support. 3) Instructor should know in 3 issues; knowledge of develop contents and courseware plan for e-Learning, knowledge of develop courseware for LAMS and knowledge of tracing and evaluation in LAMS system. 4) Learner should receive training for guide to learn by e-Learning. 5) Information resources or Library which has all of information sources follow by contents of information literacy.

2. Recommendation for Future Works. This study emphasize the development of courseware for e-Learning follow of System Development Life Cycle, so give precedence to test and evaluation of courseware more than evaluation of learning or competency learner. Even

through in process of develop has precedence to aim at desirable competency, define content according to standard and desirable result, include with activities learning. But in process of study do not evaluate of learning outcome. So for next complete study should study and use as comprehensive replacement media for all course and compare test between e-Learning and class. Which has clear result study.

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## **An e-Learning Facilities Developing Framework**

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### **ABSTRACT**

**Today, the adoption of e-Learning is widespread among educational institutions. Nevertheless, many authors have argued that technical, organizational, cultural and pedagogical factors are important in developing e-Learning facilities. A balancing of them is necessary to be considered, ensuring the improvement in student learning outcomes. This paper proposes a framework of processes for developing the e-Learning facilities. This framework is adapted from an existing process of software development in software engineering discipline. Therefore, this paper presents an overview of the software development process and discusses its possible application to the domain of e-Learning. It is considered as a guideline to improve e-Learning facilities' development and it has been implemented in an IT research e-Learning course. Its school record is compared to another IT research Face to Face or traditional course. The paper concludes with a discussion of the possible merit in the using this proposed framework.**

### **Keywords**

e-Learning Facilities, Software Development Model

### **1) INTRODUCTION**

With the rapid growth in e-Learning programs, it's concerned about how best to support student learning in universities. Therefore, universities continue to embrace new technologies in most aspects of the teaching and learning process. However,

while some institutions have achieved success, others have struggled to attain limited educational value. Moreover, Rashty (2012) pointed that there is an argument that traditional learning is the best way of maintaining a learning process. But there is no finding to support this argument, and research shows that e-Learning models are at least as good as traditional learning. However, in other studies, too, it was argued that computer mediated or online learning is more effective and interactive.

Therefore, universities are increasingly conscious of their investment in e-Learning activities and are looking for an e-Learning framework, students have expressed higher satisfaction and rated the learning as more effective than in the traditional framework. The reasons for these limited successes are many and varied from technical, organizational, cultural to pedagogical considerations. Because of these differing considerations, universities are willing to look for guidance on improving their e-Learning process. In an effort to develop such a framework of flexibility to guide the improvement of e-Learning, the researcher has turned to the software engineering discipline. The software development model has been applied to develop this e-Learning improvement framework..

### **2) AN E-LEARNING**

#### *2.1) e-Learning definition*

To provide a comprehensive understanding of e-Learning, the word e-Learning is firstly defined (Chengzhi, 2004) "e-Learning is a new education concept by using the internet technology, it deliveries the digital content, provides a learner-

oriented environment for the teachers and students.”

## 2.2) e-Learning Domain

The e-Learning domain introduces its concept of study in the field of instructional technology (Naiden, S., 2006). Therefore, some of the key issues associated with e-Learning could be defined into 4 areas (Marshall, S.&Mitchell,G., 2002) as:

- Student learning includes pedagogy, class interaction, monitoring, evaluation, and psychological theories underlying e-Learning.
- Resource creation includes technology and tools, contents, and human factors.
- Project support includes facilities that serve to ensure success.
- Organization includes culture, business, marketing, and management.

## 2.3) e-Learning facilities

To support e-Learning activities, something designed and created to serve an e-Learning function in its domain and to afford a convenience or service, is called e-Learning facilities. Therefore, e-Learning is expected to be good if e-Learning facilities are completely developed. Both of e-Learning and software are as a product of the technologies revolution. And software development model is a well-recognized standard for guiding process improvements in organizations’ software development processes. Therefore, it is believed that it could be also applied into e-Learning improvement processes.

## 3) THE SOFTWARE DEVELOPMENT MODEL

Based on the work of a software engineering pioneer, software development was considered in a software life cycle model. There are many models including

classical waterfall model, prototyping model, evolutionary model, spiral model, and so on. However, the classical waterfall model can be considered as the basic model and all other life cycle models as embellishments of this model. Therefore, classical waterfall model is used to apply into e-Learning improvement framework.

The classical waterfall model divides life cycle into phases shown in figure 1. The name of this model is justified by its diagrammatic representation which resembles a cascade of waterfalls.

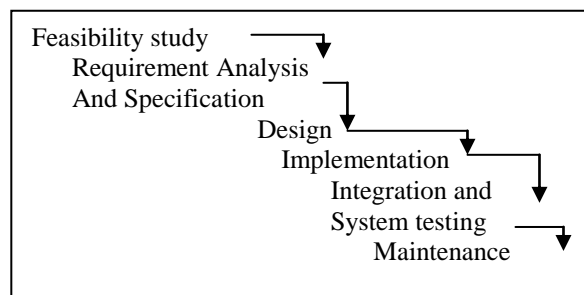


Figure 1. Classical Waterfall Model

The waterfall level of the model can be described as :

- Feasibility study: It is to determine whether it would be financially, and technically feasible to develop the product.
- Requirement analysis and specification: It is to understand the exact requirements of the customer and to document them properly.
- Design: It is to transform the requirement specified in the requirement specification document into a structure that is suitable for implementation.
- Implementation: It is to translate the software design into source code.
- Integration and system testing: Each modules are integrated in a planned manner. When all modules have been successfully integrated and tested, system testing is carried out.
- Maintenance: It is involves performing correcting errors, improving and enhancements. (Mall, R., 2008)

As above, both e-Learning and software are a product of technological revolution. It is clear that on this basis, it is reasonable to apply software development model into the field of e-Learning.

#### 4) APPLICATION OF THE CLASSICAL WATERFALL MODEL TO E-LEARNING

On the basis of the strengths of the classical waterfall model, it's reframed in the context of e-Learning for identifying outcomes as shown in Table 1.

Table 1: An e-Learning Developing Framework

| Activity             | Outcomes  |
|----------------------|---|
| Feasibility study    | Technical, organizational and pedagogical feasibilities   |
| Requirement analysis | Clear objective for eLearning<br>Consolidate and analysis requirements for e-Learning<br>Specify requirements (What to do?) |
| Design               | Transform requirement specification into a detailed operational plan (BluePrint) (How to do?)                               |
| Implementation       | Do/work on plan<br>Test and rework (in case of unsuitable)  |

The detail of the framework will be presented in the following sections.

#### 5) AN E-LEARNING IMPROVEMENT FRAMEWORK

The e-Learning facilities development framework is focused on guiding improvement in e-Learning. It's started with the existing and requirements of stakeholders in e-Learning system. After then it's moved to design the eLearning

facilities to support or serve the system to meet goal of e-Learning system.

In adapting the framework to the domain of e-Learning, the researcher has presented in each activity as shown in figure 2.

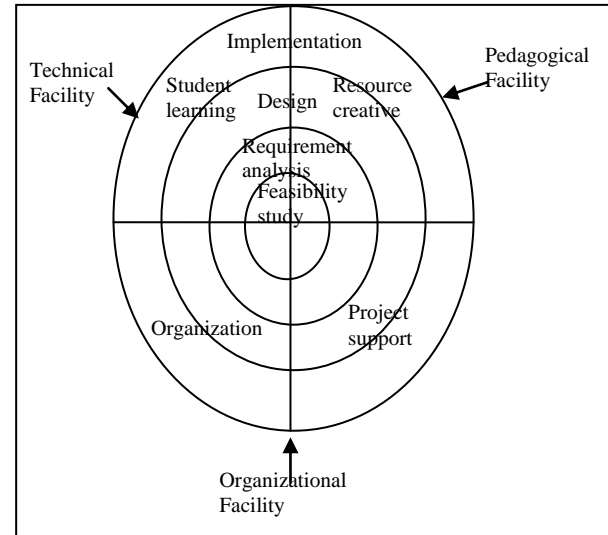


Figure 2: e-Learning Improvement Framework.

The diagrammatic representation of this framework appears like a circle with many circles. Each circle represents each activity of the e-Learning system development. The inner circle is concerned with feasibility study, the next circle with requirement analysis, the next one with design and the outer circle with implementation. Each circle in this framework is split into four sections as shown in figure 2. The first section identifies student learning that is about pedagogy, psychology, student culture and evaluation. The next section is resource creation identifying the development of content, staff, hardware, software and IT infrastructure. The next one is project support that identifies the solutions possible for supporting the e-Learning project. The last one is organization that is related to management, policy and procedure standard, business and marketing of e-Learning system.

Moreover, there are three e-Learning facilities supporting outside circle. This means these facilities will be designed and

created to serve e-Learning system. They will facilitate a whole of e-Learning system to improve eLearning successful. In this proposed framework, e-Learning facility consists of three areas, as following:

- Pedagogical facility:
  - Content management (design, create, update, and present)
  - Learning management (accessing, monitoring, and communication)
  - Evaluation (testing and assessment)
  - Psychology underlying e-Learning
- Technical facility: (hardware, software, and IT infrastructure)
 

Tools for

  - Accessing e-Learning: web browser, media player
  - Delivering e-Learning: web server, LMS, LCMS, collaboration tools, virtual schedule system, media servers
  - Development and design of e-Learning content: course authoring tools, website authoring, testing and assessment tools, media editors, and content converters
- Organizational facility:
  - Human Resource Management (staff training, IT supporter)
  - Financial and management
  - Policy and procedure standard
  - Marketing
  - Quality management

To provide a comprehensive understanding of e-Learning facilities, table 1 shows an example of the operational strategies for development

Table 1: The operational strategies for development

| Facility strategy area  | Considerations/Tasks  |
|-------------------------|---|
| Technical strategy      | <ul style="list-style-type: none"> <li>• What will be the minimum specifications of functions and capacities for hardware?</li> <li>• What software is presently in use?</li> <li>• Can either vendors or IT staff maintains and support software implementation?</li> <li>• Do e-Learning system enable users off-campus to use the IT systems with the same quality as their peers on campus?</li> <li>• What types of network security should be provided?</li> <li>• Does the existing data enables users to meet their needs?</li> </ul> |
| Organizational strategy | <ul style="list-style-type: none"> <li>• How can university provide training to e-Learning users on how to use eLearning system?</li> <li>• What should be done to ensure that university allocate sufficient budget to support eLearning activities?</li> <li>• Who will allocate and design facilities?</li> <li>• How will policy and procedures be developed?</li> <li>• What can be done to involve people and increase their</li> </ul>   |

|                      |  |
|----------------------|--|
|                      | awareness of e-Learning being used in the university?  |
| Pedagogical strategy | <ul style="list-style-type: none"> <li>• What and how the psychological theories underlying eLearning?</li> <li>• What should be done to ensure that lesson could be designed and implemented in e-Learning?</li> <li>• What and how should be done about the evaluation?</li> </ul> |

### 6) THE IMPLEMENTATION OF AN E-LEARNING FACILITIES DEVELOPING FRAMEWORK

The first purpose of this study was to propose an e-Learning facilities developing framework. The second purpose was to implement this proposed framework in an e-Learning course. The study was conducted at Rangsit university, Thailand and included two sections of graduate IT research course. The first section taught in e-Learning with the implementation of this proposed framework and the second section in traditional class: teaching two sections of the same course during the same semester. A total of 57 students were identified as population. Of these 57 students, 33 were identified in e-Learning class and the rest were in traditional class. At the end of the course, total scores of students in each section are compared. The researcher analyzed data using T-test. The result provided the clarity of how different between e-Learning implemented with the framework and traditional study.

Hypothesis: the mean of total score of e-Learning class is equal to the mean of total score of traditional class.

Result: Table 3 shows the mean scores and p-value computed by T-test

Table 3: t-test two-sample assuming Unequal variances

|                              | <i>Traditional</i> | <i>e-Learning</i> |
|------------------------------|--------------------|-------------------|
| Mean                         | 81.41666666        | 80.545454         |
| Variance                     | 23.64492753        | 58.943181         |
| Observations                 | 24                 | 33                |
| Hypothesized Mean Difference | 0                  |                   |
| df                           | 54                 |                   |
| t Stat                       | 0.523331954        |                   |
| P(T<=t) one-tail             | 0.301442161        |                   |
| t Critical one-tail          | 1.673564906        |                   |
| P(T<=t) two-tail             | 0.602884322        |                   |
| t Critical two-tail          | 2.004879274        |                   |

Analysis: Overall, the result of this comparative study on eLearning and traditional study were these:

- P-value (0.60) is greater than 0.05 (95% confidence interval). The hypothesis was accepted. There are no difference on teaching in these treatments.
- Using an e-Learning facilities developing framework into e-Learning will be at least as good as traditional learning.

Finding of the research, implementing an e-Learning facilities developing framework into e-Learning indicated an improvement in the student's achievements. The e-Learning also includes advantages that are not found in traditional learning, such as: time (24 hours 7 days), places (everywhere), enhanced communication among the learners, the ability to conduct an open discussion, and so on.



## 7) CONCLUSION

The paper demonstrates that it is possible to adapt the software development model to provide a guidance to aid instructor efforts aimed at improving e-Learning course. Actually, the framework might be incomplete but at least it provides a useful guideline for encouraging improvements in e-Learning. It has been informally implemented in IT research course, Rangsit University as a guide. It is hoped that a more formalized framework will be developed through a number of courses. Finally, the framework presented in this paper do not provide details of key processes necessary for improvements in e-Learning. Nevertheless, finding of the experiment was as an indicator of possible out come of improvement in e-Learning.

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# Multiple Group Structural Equation Modeling Development for Factor Analysis that affects Information Technology Service Management of Higher Educational Academic Institutions

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## ABSTRACT

The research study aims (1) to analyze factors and relational structures that affect information technology service management of higher educational academic institutions and (2) to develop a structural equation model of the total of 31 referenced indicators from ITIL (Information Technology Infrastructure Library)'s standard framework and theories and 300 samples were collected. All then were analyzed and two factors were extracted giving equations showing factor relational structures using multiple group structural equation analysis. The developed model shows that the information technology service management satisfaction is consistent with the data (Goodness of Fit), with p (P-Value) 0.05 and RMSEA (Root Mean Square Error of Approximation) 0.094

## Keywords

ITSM, Service Management, ITIL (Information Technology Infrastructure Library), Structural Equation Modeling

## 1) INTRODUCTION

The present uses of information technology services in higher education institutions are increasingly. Higher education institutions have adopted information technology as a tool in management, Teaching and learning. While more research needs to be more available and higher education institutions

must have a good process Service management. To analyze have good information technology about its services. Information Technology Service Management ITIL V.3 Foundation is an international standard in many countries have made to the guidelines. In the development, administration, information technology services Management. It is not just a service. The service only can become a strategic tool of the higher educational academic institutions.

The result was to analyze of information technology services management. In addition, the model developed. Can also be used with other institutions, this article will be useful in the management of information technology services for each of the next.

## 2) THEORY AND METHODOLOGY

The researchers used the technique to develop the model.

### 2.1) Factor Analysis

*Factor Analysis is a technique used to extract the factors (component) from a group of indicators that are related to each factor. This will be used instead of a group of indicators. This is a technique that reduces the number of dimensions or manifest variable and considers the suitability of the extracted factors. By checking the statistics Kaiser-Meyer-Olkin: KMO ( $KMO > 0.60$ ) factors obtained*

will only validate the considered values. Able to explain the variability of all the factors together (total variance explained) with the inverse of each variable with no apparent extraction factor would greatly benefit this approach. If the value of a high percentage (cumulative explained variance) showed that the factors can represent a good indicator, this can be formulated as follows

$$F_j = w_{j1} + x_1 + w_{j2} + x_2 + \dots + w_{jp} + x_p + e \quad (1)$$

Where:  $F$  = factor,  
 $w$  = coefficient of variable  $x$   
 $x$  = manifest variable  
 $e$  = margin of error.

## 2.2) Structural Equation Modeling

Structural Equation Modeling (SEM) is a technique used to analyze the relationship of factors from the survey (exploratory) with a key and then extract a model of the relationship of various factors, which is the main theory or hypothesis of this study. From the statistics of 1) Chi-square ( $\chi^2$ ) should be a non-significance ( $P > 0.05$ ) 2) Goodness of Fit Index ( $GFI > 0.90$ ) 3) Root Mean Square Error of Approximation ( $RMSEA < 0.06$ ) and 4) Hoelter's  $N$ , the value (Hoelter's.  $N > 75$ ) is used to check the adequacy and appropriateness of sample size (case) in SEM.

## 2.3) Accuracy Evaluation Criterion

*Accuracy Evaluation Criterion of a new data set, which must be precisely compatible (model best fit) by applying a set of new data (predicted missing) derived from the estimation of missing data to verify the real data set (actual missing) and then calculate the Magnitude of Relative Error (MRE) according to the formula*

$$MRE = \frac{|ActualEffort_i - PredictedEffort_i|}{ActualEffort_i} \quad (2)$$

The missing data ( $i = 1, 2, \dots, n$ ) must be used for calculating the Mean Magnitude of Relative Error (MMRE). If it is found that the results of MMRE have small values, the results should be precise or very close to the real data as formulated below.

$$MMRE = \frac{1}{n} \sum_{i=1}^{i=n} \frac{|ActualEffort_i - PredictedEffort_i|}{ActualEffort_i} \times 100 \quad (3)$$

## 2.4) Information Technology Infrastructure Library (ITIL)

ITIL is a de-facto standard which introduced and distributed by Office of Government Commerce (OGC) in UK and includes all IT parts of organizations. At present ITIL is the most widely accepted approach to IT Service Management in the world. It has an iterative, multidimensional and lifecycle form structure. ITIL has an integrated approach as required by the ISO/IEC 20000 standard with following guidance.

### 2.4.1 Service Strategy

The Service Strategy provides guidance on how to design, develop and implement service management from organizational capability perspective and strategic asset. It provides guidance on the principles underpinning the practice of service management which are useful for developing service management policies, guidelines and processes across the ITIL service lifecycle. Service Strategy guidance is applicable in the context of other parts of ITIL lifecycle. Service Strategy covers these parts of IT systems: the development of markets, internal and external, service assets, service catalogue and implementation of strategy through the service lifecycle.

Service Strategy includes these processes:

- Financial Management
- Service Portfolio Management
- Demand Management

### **2.4.2 Service Design**

It is guidance for the design and development of services and service management processes. It covers design principles and methods for converting strategic objectives into portfolios of services and service assets. The scope of Service Design includes the changes and improvements necessary to increase or maintain value to customers over the lifecycle of services, the continuity of services, achievement of service levels and conformance to standards and regulations. It guides organizations on how to develop design capabilities for service management.

Service Design includes these processes:

- Service Catalogue Management
- Service Level Management
- Capacity Management
- Availability Management
- IT service Continuity Management
- Information Security Management
- Supplier Management, Application Management
- Data and Information Management
- Business Service Management

### **2.4.3 Service Transition**

It is guidance for the development and improvement of capabilities for transitioning new and changed services into operations. Service Transition provides guidance on how the requirements of Service Strategy encoded in Service Design are effectively realized in Service Operation while controlling the risks of failure and disruption. This part of ITIL framework combines practices in release management, program management and risk management and places them in the practical context of service management.

Service Transition processes are:

- Change Management
- Service asset and Configuration Management
- Release and deployment Management
- Knowledge Management
- Stakeholder Management

- Transition Planning
- Support and Service Evaluation

### **2.4.4 Service Operation**

Service Operation tries to embody practices in the management of Service Operation. It includes guidance on achieving effectiveness and efficiency in the delivery and support of services so as to ensure value for the customer and the service provider. Strategic objectives are ultimately realized through Service Operation, therefore making it a critical capability.

It processes are:

- Event Management
- Incident Management
- Request Management
- Problem Management
- Access management

### **2.4.5 Continual Service Improvement**

This is including of instrumental guidance in creating and maintaining value for customers through better design, introduction and operation of services. It combines principles, practices and methods from quality management, Change Management and capability improvement. Organizations learn to realize incremental and large-scale improvements in service quality, operational efficiency and business continuity.

It processes is:

- The 7-Step Improving Process

## **4) METHODOLOGY**

### **4.1) Data sets for the research**

*The data set of experimental group was 290 data sets.*

### **4.2) The factor analysis of experimental group**

The experimental group focused on the factor analysis method by principal component analysis to provide a measure that is relevant to the factors in the same way as rotation varimax to reduce the

number of points. This should measure the weight of each factor to as low as possible. Results from the analysis of new factors with KMO were 0.976, and new factors from extraction consist of two main factors F1 and F2 is shown in Table 1.

Table 1: Results of main factors and indicators

| <i>Factor</i> | <i>Indicator of Factor</i>    |                    |
|---------------|-------------------------------|--------------------|
| 1             | Service Transition            |                    |
|               | Service Operation             |                    |
|               | Continual Service Improvement |                    |
|               | 2                             | Service Strategy   |
|               |                               | Service Design     |
|               |                               | Service Transition |

### 4.3) Structural Equation Modeling

The main factors F1 and F2 of building a SEM are shown in Fig. 1. The model appropriate to review the statistics of the compatibility of the model to goodness of fit: RMSEA, GFI and Hoelter's N which are the adequacy of the sample cases. The results in Table 2 and the new SEM are shown in Fig. 2

Table 2: The statistic's compatibility of SEM

| <i>Model</i>            | <i>Default</i> |
|-------------------------|----------------|
| Chi-square ( $\chi^2$ ) | 1.546          |
| GFI                     | 0.710          |
| AGFI                    | 0.667          |
| RMSEA                   | 0.094          |
| Hoelter's               | 91             |

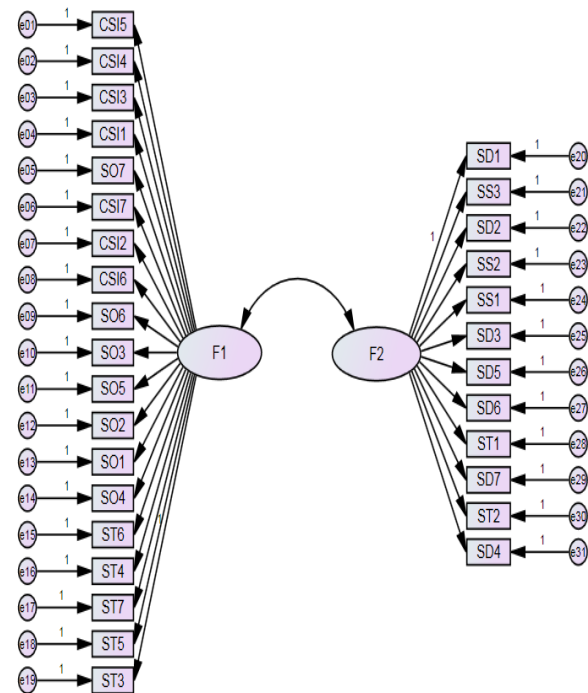


Figure 1: SEM standardized type

### 4.3) Product indicator approaches of structural equation modeling with constrained approach

The only measure left over from the results of the SEM according to Fig. 1 is  $F1 = \{CSI5, CSI4, CSI3, CSI1, SO7, CSI7, CSI2, CSI6, SO6, SO3, SO5, SO2, SO1, SO4, ST6, ST4, ST7, ST5, ST3\}$  and  $F2 = \{SD1, SS3, SD2, SS2, SS1, SD3, SD5, SD6, ST1, SD7, ST2, SD4\}$  to create SEM have the statistics of compatibility.

## 5) RESULTS

The test group of 290 sets was assigned to find estimate the replacement value of missing data as follows:

1) the data imputation estimation methods using SEM, the result of MMRE was 25.23%

2) Thus, comparing estimates of data showed that using the SEM with the unconstrained approach and related indicators had high accuracy, while MMRE declined using the constrained approach with related indicators.

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## A Strategy for e-Training in Information Technology Security

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### ABSTRACT

**This research aimed to develop e-Training Strategy for Information Technology Security Model which included 5 steps; Step 1-Depth interview of 8 e-Training Strategy Experts. Step 2-Analysis and synthesis of data and information obtained from expert depth interview and the analysis and synthesis of 12 models of e-Training Strategy in order to develop the outline of e-Training Strategy for Information Technology Security Model. Step 3- Primary assessment of the outline of e-Training Strategy for Information Technology Security Model by 5 experts. Step 4-Evaluation of the outline of e-Training Strategy for Information Technology Security Model by 21 experts. Step 5-Further to the analysis by experts, it had found that e-Training Strategy for Information Technology Security Model consisted of 6 components namely Planning, Analyzing, Designing, Developing, Role Playing, and Evaluation.**

### Keywords

e-Training Strategy, e-Training Strategy for Information Technology Security, Information Technology Security, Online Training

### 1) INTRODUCTION

“Human” is the most significant drawback of security system that causes determined policy, standard, advice and procedure ineffective (Ministry of ICT., 2007, Dark, 2007). The information technology and

communication act, 2554-2563 B.E., hence, emphasized on developing human resources to be capable of developing and applying information technology efficiently, considerately and thoughtfully. In addition, the act also emphasized on promoting standardized knowledge, ability and skill (Ministry of ICT., 2010). Information technology human resources are increasing continuously due to the growth of information technology. At present, there are many knowledgeable and capable personnel in information technology both in private and public sectors proven by a large numbers of graduates, but Thailand still lacks of skillful information technology personnel both quantitatively and qualitatively (Ministry of ICT., 2009). Further to findings from the survey of 403,842 information technology personnel working in private and public sectors, it had shown that among these people, 115,531 personnel were classified as highly skillful personnel and 59,513 personnel were bachelor graduated and higher (National Statistical Office, 2009). In the meantime, there were only 1,443 personnel who were classified as highly skillful or specialist in information technology security (National Statistical Office, 2010). The Ministry of ICT, therefore, had assigned the development of human resources in information technology security as one of the five urgent strategies to prompt and strengthen country development. It is necessary to develop certified human resources in information technology security who are accredited internationally. The project of creating awareness on national information technology security

and the project of information technology security and communication training, therefore, became urgent procedures of national ICT model scheme through create awareness and training, since the numbers of skillful and experienced human resources in systematic security management are still insufficient. By next decade, Thailand will need over 10,000 professionals in information technology security. It is, therefore, necessary for Thailand to have precise goals of systematic training and certification administration. So we will have human resources to take care of corporate information technology security or to give counseling about information technology security to local and foreign enterprises (Ministry of ICT., 2007). Further to the joining of Asian Free Trade Area in 2015, information technology will be affected in terms of transferring or exchanging of labor, business, investment and information and knowledge (Ministry of ICT., 2010). The movement will encourage skillful information technology personnel to be employed by foreign companies and lead to labor shortage in the local industry. It is, therefore, necessary for the government to determine precise goals of awareness creation and training in order to enable human resources to manage information technology security effectively. This can be achieved by increasing the numbers of workforce who graduated bachelor degree or obtained internationally accredited training (Ministry of ICT., 2009). Information technology was increasingly applied and adapted for educational management, passing on knowledge and training in the form of e-Training. It is the learning method which is flexible, cost saving and highly independent of time (Jokela, Karlsudd, 2007, Kavathatzopoulos, 2003). Internet based learning improves learning performance by computers and information technology devices (Jalal, and Mian Ahmad Zeb, 2008). Information technology is effective to manage

enormous data and information. It also allows two way communications among teachers and learners. This new learning model will provide good opportunity for long life learning, and it is suitable for mentoring teaching strategy rather than teacher based teaching (Jokel and Karlsudd, 2007). The new learning model also complies with the Eleventh National Economic and Social Development Plan which focused on people as the center of development for sustaining long life learning society. The researcher was aware of the importance of e-Training Strategy for information technology security model and was interested in developing it to solve the information technology security human resource shortage problem that had never been studied before

## **2) RESEARCH OBJECTIVES**

To develop e-Training Strategy for Information Technology Security Model.

## **3) LITERATURE REVIEW**

(Sittiwong, 2006), had developed e-Training workshop model for teacher had found that e-Training workshop model for teacher consisted of analysis, design and development, transmission and model evaluation of e-Training model. (Rattaman, 2008), had developed web based Training model and found that overall trainees highly needed web based Training, post training achievement was higher and overall trainees were highly satisfied with web based Training. (Mohd Nordin, and Other, 2007), had studied the application of open source software to design and develop online leadership and educational administration lessons based on Moodle's on-line lesson development model, and they had found that the developed lessons were successful to promote higher education teaching and learning. In addition, the developed model could support educational institutes in designing and developing online lessons as



well. (Kim and Choi, 2002)., had analyzed professional learning needs among information technology security managers (ISMs) in Korea and found two highest ranked learning needs as the development of information technology security and the development of information technology security evaluation. Further to the analysis of professional learning needs among information technology security developers (ISSDs) had found three significant technical knowledge including information technology security technology, information technology and system hacking technology. (Clarke, Lewis, Cole, and Ringrose, 2005), had studied about strategies to improve e-Training to increase the opportunity to learn among personnel in health and sanitation organizations. They had found that health and sanitary e-Training could improve learning opportunity and facilitate health and sanitation organization to train their personnel in different locations. Integrating learning was the most suitable learning strategy. Significant requirements of this learning strategy was the intention to save time and cost, meanwhile, its progress depended on how well did the organization proceeded.

#### **4) RESEARCH METHODOLOGY**

This study aimed to develop e-Training Strategy for Information Technology Security Model. Population and sampling group included 3 groups of expert. Group 1 included 8 e-Training Strategy Experts. Group 2 included 5 e-Training strategy structural development experts. Group 3 included 21 e-Training Strategy structural evaluation experts. Research methodology included 5 stages as below;

Step 1- To draft depth interview for experts which was later reviewed by research advisor and co-advisor. Finally, 8 experts were interviewed.

Step 2- To analyze and synthesize data gathered from depth interview with 8 experts and to analyze and synthesize

e-Training Strategy from 12 models of training process. Analysis and synthesis, then, was applied to develop the structure of e-Training Strategy for Information Technology Security Model which was evaluated by research advisor and co-advisors and revised later on.

Step 3- To evaluate the structure of e-Training Strategy for Information Technology Security Model initially by 5 experts and revise.

Step 4- To evaluate the structure of e-Training Strategy for Information Technology Security Model by 21 experts.

Step 5- To develop e-Training Strategy for Information Technology Security Model based on structural evaluation of e-Training Strategy for Information Technology Security Model by experts.

#### **5) RESULTS**

e-Training Strategy for Information Technology Security Model included (Wilson and Hash, 2003, Department of the Air Force, 1993, Moskowitz, 2008, Rossett, 2002, Blanchard and Tracker, 2010, United States Marine Corp., 2004, European Training Foundation, 2009, Bozarth, 2008, International Society for Performance Improvement, 2002, Sintapanon, S. and Other, 2011, Jaitueng, 2010, Khammani, 2010)

##### **1. Planning**

1.1 To determine and prepare ideas of e-Training in order to come up with the best idea as guideline of e-Training procedure and its limitation.

1.2 To generate administration and evaluation plans of e-Training in order to ensure that we could control e-Training process effectively, timely and under budget. These plans should consist of sufficient data to administer and evaluate the effective e-Training program.

##### **2. Analyzing**

2.1 Trainee analysis refers to collect, analyze and evaluate data of knowledge, understanding, attitude, expectation, perception or feeling, idea, skill and ability

about information technology security of trainees. Trainee analysis results were afterward applied as guideline of e-Training and reduce the gap between current knowledge and ability among the trainees and their actually required knowledge and ability.

2.2 Content and resource analysis refers to determination and evaluation of feedback effectiveness and efficiency of circumstances related to the organization and human resources, information technology security and communication, task and responsibility of human resource, working tool and equipment, resources used in developing e-Training, along with cost, time and limitation of resources.

2.3 e-Training Content Analysis

2.4 Problem analysis or role play analysis refers to the analysis of possible problem or question for information technology security role play. It consisted of the identification of situation, problem or question for trainees' learning.

2.5 e-Training Activity Analysis

2.6 To analyze and determine e-Training role play situation were proceeded when we had got precise problem and objective. Then information technology security situation would be described to trainees verbally or literally, so trainees would understand the primary online situation.

### **3. Designing**

3.1 Online e-Training system was designing e-Training activity based on e-Training Management System (LMS) with open sourced software including e-Training registration, e-Training orientation, introduction to e-Training lesson and content, testing, follow up and trainee assessment.

3.2 The objective of e-Training and role play concerned about the determination of goal or learning objective obtained from e-Training that complied with its necessity, content, working situation and utility. Chosen e-Training must be the most suitable for the trainees would obtain maximum knowledge, understanding, positive attitude, highest skill and ability.

3.3 Designing e-Training consisted of e-Training planning, training material content, role play situation and designing e-Training evaluation.

### **4. Developing**

4.1 Developing and testing online e-Training

4.2 Developing e-Training content

4.3 Developing and testing training material

4.4 Developing role play situation

4.5 Developing e-Training evaluation

### **5. Role Playing**

5.1 Theoretical e-Training consisted of pre training activity, during training activity and post training activity.

5.2 E-Training role play consisted of role play introduction, role play performance, post role play performance learning exchange and discussion.

### **6. Evaluation**

6.1 e-Training follow up was to evaluate on process or during online e-Training activity from the beginning of e-Training system planning and development to the final stage of e-Training in order to evaluate its feasibility, mistake and difficulty level of each activity.

6.2 On process e-Training evaluation refers to the evaluation of e-Training progress. The result would be used to improve e-Training quality according to its objective. It also concerned with pre-learning test, during learning test, exercises, online e-Training tracking or monitoring according to its specified steps and time frame.

6.3 Post e-Training evaluation refers to evaluation and conclusion of e-Training with post-training and learning test. The result would be used to grade trainee's achievement, e-Training strategy effectiveness and satisfaction towards e-Training strategy.

## **6) CONCLUSION**

Information technology security e-Training is the significant and urgent duty that private and public sectors must proceed because of high need of information

technology human resource. In addition, newly information technology is continually developed that higher information technology security is more demanded. Hence, this research was to develop e-Training Strategy for Information Technology Security Model that could develop different information technology security e-Training from the typical ones. Our model was examined and evaluated by experts and came up with appropriate e-Training strategy that consisted of e-Training planning, e-Training analysis, e-Training design, e-Training development, e-Training role play and e-Training evaluation.

Since information technology security online e-Training was capable to save time and cost of e-Training, especially it came up with e-Training role play that enabled trainees to obtain real life working skill and learn about various case studies of information technology security technology through role play.

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## AAS : Algorithm Analysis Service for Computer Science e-Learning

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### ABSTRACT

**This paper presents an e-Learning service for experimental analysis of computer algorithms. Design and analysis of algorithm is one of the core knowledge units in Computer Science curriculum. We usually analyze algorithms to determine their running time as a function of input sizes. The analysis can be done mathematically and experimentally. Mathematical analysis is usually considered to be a complex process for novices. Experimental analysis can be used to verify the mathematical analysis result and sometimes exposes algorithm insight. Algorithm Analysis Service (AAS) presented in this paper is a web application accepting the algorithm under study and experimental parameters, performing the experiments and showing experimental results. AAS accepts algorithms written as a Java program. It also accepts experimental parameters such as range of input sizes and input characteristics. Experimental results are shown as a line plot of execution counts versus input size along with their correlation using curve fitting. In addition, an instruction-execution-count histogram is also shown adjacent to the source code for better visualization. Experiments are performed in full-speed using a source code instrumentation technique so that large-size data set can be used. Users can use AAS via a web form or REST web service protocol. Students can use AAS to experimentally analyze standard textbook algorithms or their own designed algorithms to expose their pros and cons.**

### Keywords

algorithm analysis, experimental analysis

### 1) INTRODUCTION

An algorithm is a sequence of computational steps that transforms input into output of a given problem. It is a tool for solving well-defined computational problem (Cormen et al., 2009). When writing non-trivial computer programs, programmers need to design algorithms before coding the programs. Since solving a given problem may be done using many different algorithms, programmers must be able to analyze each algorithm to determine its efficiency. We usually analyze an algorithm to determine its execution time and memory space as a function of input size. Algorithm analysis can be done mathematically and experimentally (Sedgewick and Flajolet, 1996). To mathematically analyze an algorithm is to formulate a mathematical function representing its behavior. Execution counts of key operations in the algorithm are usually used to represent time efficiency. For example, a simple data sorting algorithm called Selection Sort uses  $n(n - 1)/2$  data comparisons (Cormen et al., 2009) where  $n$  is the number of data to be sorted.

Algorithm analysis is therefore a very crucial core knowledge unit. It is one of the required knowledge units in the latest ACM Computer Science Curriculum (ACM, 2008). However, mathematical analysis is usually perceived as a hard topic. Fortunately, algorithms can be analyzed experimentally by writing a program implementing an algorithm of interest, executing the program using various different kinds and sizes of inputs, measuring resources used and finally plotting the data as a graph to visualize the relationship of execution counts and input sizes. This usually leads to some insight of

algorithm behavior (Brassard and Bratley 1996).

This paper presents an e-Learning service called *Algorithm Analysis Service* (AAS) facilitating many cumbersome and time-consuming tasks in experimental analysis of algorithms. The system relies on a source-code level instrumentation technique to insert counters into the source code automatically. AAS provides the service via web form or via a simple REST protocol. The experimental results are shown as line graphs and histograms on the web page. For a very time-consuming experiment, the system provides an option to send email notification when the experiment is done.

The paper is organized as follows. Section 2 presents related work in tools used in experimental analysis. Section 3 explains the internal structure of our AAS system. Examples are shown in Section 4. The paper concludes in Section 5.

## 2) RELATED WORK

Profiler is a tool for resource usage analysis during program execution (Liang & Viswanathan, 1999). In Java platform, profiler collects data using JVMPI (Java Profiling Interface) and JVMTI (JVM Tool Interface) (Hunt and Binu 2011). The tools do not support profiling performance at instruction level.

JP (Binde & Hulaas, 2006) and ByCounter (Kuperberg, Krogmann and Reussner, 2008) are two profiling tools at byte code level. The tools can measure overall efficiency of the program, but they do not measure counts at each individual instruction.

JProfile101 (Nilla-or & Prasitjutrakul, 2009) is a source-code level profiler which requires users to manually insert specific counting instructions at operations of interests. However, specifying which

operations to be profiled is not an easy task especially for students or novices.

## 3) AAS

To use the mentioned profiling tools, users are required to install the tools and go through some complex setup procedures. This leads to an idea of developing a web-based service for experimental algorithm analysis called AAS that requires only a web browser to use the system. In addition, the system instruments a given Java program by inserting counting instruction next to every instruction of the program at the source-code level so that heavy resource intensive instructions can be easily identified.

The internal structure of AAS is shown in Figure 1. AAS accepts a Java program along with a set of experimental parameters via a web form. The Java program is instrumented with counting instructions and then fed to our own JProfile101 controller engine. Since JProfile101 only profiles instructions tagged with system-specific counting instructions, the instrumentation process simply tags *all* instructions in the Java program with the counting instructions before feeding to JProfile101 to perform experiments. After the experiment is done, all the profiling data are read back to AAS for further analysis. The system presents experimental results in form of graphical views in web pages back to the user.

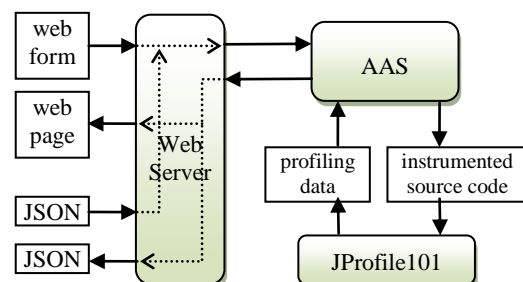


Figure 1: Overall AAS

### 3.1) Input

Experiment inputs are entered via a web form as shown in Figure 2. They consist of a source-code of Java method in a text area and a set of experimental parameters such as:

- The name of experiment.
- input data generator such as
  - RandomIntArray
  - SortedIntArray
  - ReverseIntArray
- Range of input sizes specified as From, To, and Step parameters.
- The number of repeats for each data size (this is used for average case analysis).
- curve fitting option
- Email used for notification when the experiment has completed.

Please Input Method for the Experiment.\*

```

public void quicksort(int[] a) {
    quicksort(a, 0, a.length - 1);
}

public void quicksort(int[] a, int left, int right) {
    if (right <= left) {
        return;
    }
    int i = left - 1;
    int j = right;
    while (true) {
        while ((a[++i]) < (a[right])) {
        }
        while ((a[right]) < (a[--j])) {
            if (j == left) {
                break;
            }
        }
        if (i >= j) {
            break;
        }
        int swap = a[i];
        a[i] = a[j];
        a[j] = swap;
    }
    int swap = a[i];
    a[i] = a[right];
    a[right] = swap;
    quicksort(a, left, i - 1);
    quicksort(a, i + 1, right);
}
    
```

Please Define the Initial Data.

The Name of Experiment: QuickSort

RandomIntArray

Add Clear

Input Class Array (Input)\*

RandomIntArray

Initial Number of Random Data (Seed)

Input Array (From)\* 100

Input Array (To)\* 1000

Step to Input the Size of Array (Step)\* 100

Number of the Experiment (Repeat)\* 100

The Name of Axis X

The Name of Axis Y

Curve Fitting  True  False

The Results via Email: anin.kr@gmail.com

Analyse

Figure 2: A web form for system input.

### 3.2) Output

The profiling data are analyzed and presented in two different views; a histogram and a line graph, as shown in Figure 3 and Figure 4, respectively.

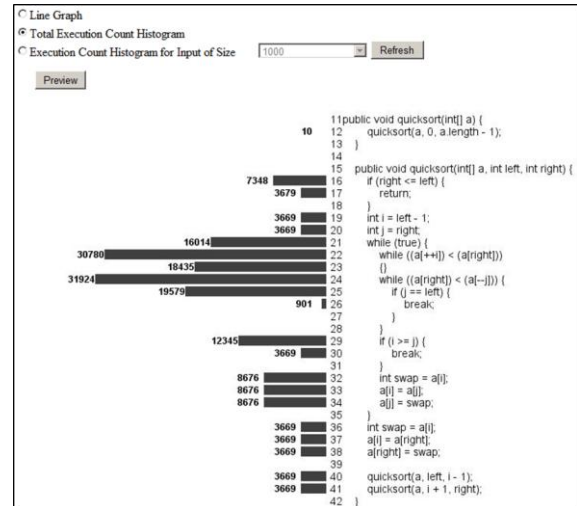


Figure 3: A histogram shows execution count frequency of each instruction.

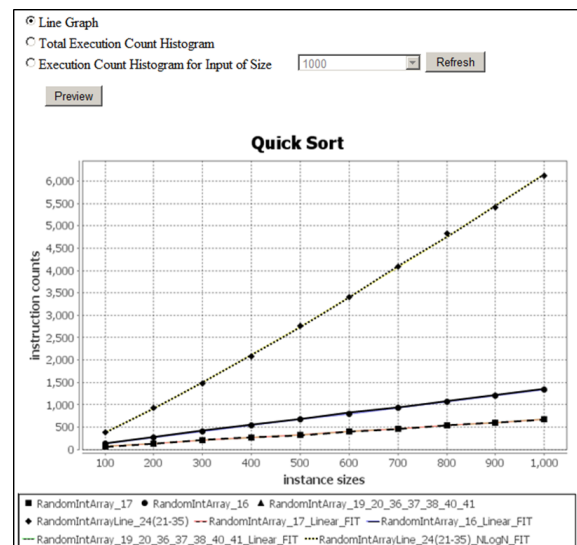


Figure 4: A line graph shows the relationship of execution counts and input size.

The histogram shows how frequent each instruction gets executed compared to others. This shows hotspot areas of the program where most of the running time was spent during execution. The line plot presents the relationships of execution counts as a function of input size. The system also tries to fit a set of standard

curves (e.g.,  $\log n$ ,  $n$ ,  $n \log n$ ,  $n^2$ ,  $n^3$ ) to the output data and shows the most fitted curve.

### 3.3) REST Web Service

AAS allows users to interact with the system via web forms as previously described. The service can also be called and interfaced with other services via REST protocol (Allamaraju, 2010) (See Figure 1). Interfacing with the service is easily done using URL address in the following format:

```
http://servername/AAS/AASServ.svc/
profile?attr=JSON
```

where *servername* is a valid server name hosting the AAS and *JSON* is an input parameters of the experiment written in JSON format (Allamaraju, 2010). For example, a simple experiment for finding maximum element can be written as follows:

```
{"codeMethod": "int max(int[] d) {
    int m = d[0];
    for (int i = 1; i < d.length; i++)
        if (m < d[i]) m = d[i];
    return m;}",
"strInputClsArray": ["RandomIntArray"],
"fromVal": 100, "toVal": 1000, "stepVal": 1,
"repeatVal": 200, "curveFitting": true}
```

When the experiment has completed, AAS also responds back to the caller with a JSON object specifying the URL address of the two result views such as:

```
{"urlResult": "http://192.168.0.20/AAS/Output.aspx?expName=Exp2012032703452" }
```

## 4) EXAMPLES

### 4.1) Bubble Sort

A very simple sorting algorithm (usually introduced in the first programming course) is bubble sort. This algorithm swaps adjacent data whose orders are incorrect as shown in Figure 5. The experimental result views are shown in

Figure 6 and 7. Figure 7 exhibits a quadratic function as being confirmed from curve fitting provided from the system at the bottom of the graph (specified as Power2\_FIT).

```
11) public int[] bubbleSort(int[] data) {
12)     for (int i = 0; i < data.length; i++) {
13)         for (int j = i; j < data.length; j++) {
14)             if (data[i] > data[j]) {
15)                 int temp = data[i];
16)                 data[i] = data[j];
17)                 data[j] = temp;
18)             }
19)         }
20)     }
21)     return data;
22)}
```

Figure 5: BubbleSort.

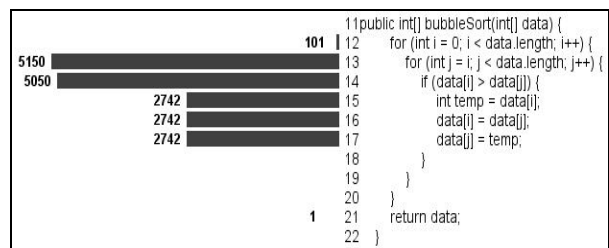


Figure 6: Histogram of execution counts in BubbleSort ( $n = 100$ ).

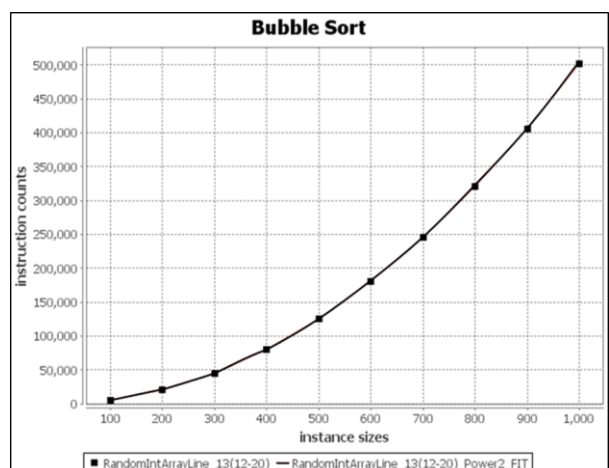


Figure 7: Execution counts as a function of input size for BubbleSort.



## 4.2) Insertion Sort

Another simple and useful algorithm in practice for sorting small size data is Insertion Sort shown in Figure 8. The control structure of Inserting Sort is more complicated than that of Bubble Sort. It inserts a new element to the left of them in the sequence so that the result after being inserted is sorted. Iterating the insertion process from the 2<sup>nd</sup> element to the last makes the whole sequence sorted. Experimental result views are shown in Figure 9 and 10. Although the line graph shows the same quadratic behavior as Bubble Sort, the exact execution counts are largely different. This is confirmed by comparing the execution counts of each instruction in the histogram of Figure 6 and 9 where  $n = 100$ .

```

11)public int[] insertionSort(int[] data) {
12)
13) for (int i = 1; i < data.length; i++) {
14)   int j = i;
15)   int temp = data[i];
16)   while (j > 0) {
17)     if (data[j - 1] < temp) {
18)       break;
19)     }
20)     data[j] = data[j - 1];
21)     j--;
22)   }
23)   data[j] = temp;
24) }
25) return data;
26) }
    
```

Figure 8: InsertionSort.

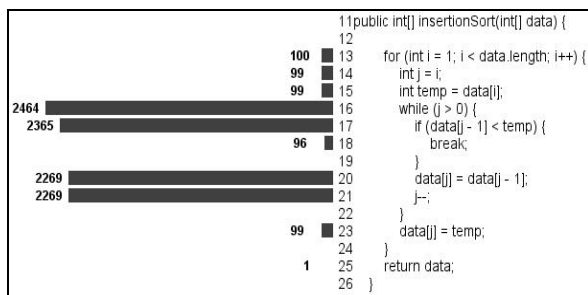


Figure 9: Histogram of execution counts in InsertionSort ( $n = 100$ ).

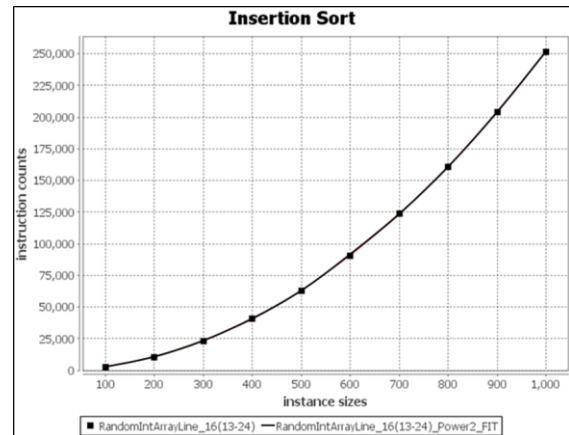


Figure 10: Execution counts as a function of input size for InsertionSort.

## 5) CONCLUSIONS

The Algorithm Analysis Service (AAS) presented in this paper can be used as an e-Learning tool for experimental analysis of algorithms in several courses in Computer Science and Engineering curriculum. The system utilizes web interface and protocol so that users only need a web browser to use the system without any requirement to install any extra program development or program analysis software. Profiling is done by instrumenting every instruction of a program under study so that the system can gather execution counts of all instructions. The experimental results are shown as a histogram of execution counts and a line plot of execution counts as a function of input size. The system can be used in class, in laboratory or in doing assignments.

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## **The Investigation of Remote Advising on Independent Study/Thesis work for students in e-Learning Mode: a Case Study of Faculty and Students in Graduate Level e-Learning Programs**

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### **ABSTRACT**

The popularity of e-Learning mode of study throughout all level of formal academic study is increasing. The majority of e-Learning development has focus on the delivery of instruction as well as initiating valuable e-Learning class experience via communication technology and social media. Although the current e-Learning resources are vast and students can learn by themselves in variety of ways, the current content may not be sufficient toward the independent study or thesis work of graduate students. In graduate level education, the independent study and thesis works are required in most cases to complete the graduation requirements. However, students often struggle to focus and keep the consistent work toward the requirements. Thus, students frequently stop the study and may postpone the work for a long period that could results in delaying the graduation. e-Learning students could face more challenges because they might not be able to visit the advisors as frequently as students who study in traditional mode of learning.

The current study aims to explore the current practice of advising students remotely by using the sample from the advisors and students from established e-Learning graduate programs at a university in Thailand. Using a structured interview method, the researcher aims to investigate the current practice and issues as well as students' and advisors' perception toward the remote advising for e-Learning students.

### **Keywords**

Collaborative work, Communication Technology, e-Learning Advising, Independent Study Project, Thesis Project

### **1) INTRODUCTION**

Studying at a graduate level in most academic programs requires students to enroll in courses as stated in the study plan as well as producing a final project work in a form on independent study or thesis. The independent study or thesis projects are important because it is the works that required for completing the degree. Furthermore, the requirements of the independent study or thesis work are often difficult and of high academic standard (Dong, 1998). As a result, many students struggle to complete the work and might give up or take longer time to graduate than the plan. Thus, delaying the degree completion.

For e-Learning students, they might already be studying at a remote location, which may make the traveling to the instructor place more difficult since they might not be able to conveniently travel to the location. As a result, the frequency of the visit might be reduced. Furthermore, the interaction between the instructors and the students are often conducted through the use of communication technology, which may or may not provide students with the impression of the instructors that the students would be working with. As a result, the adjustments of working with the instructors may need more time for adjusting to each other working style.

Even though the presented scenarios might showed that students who are studying in e-Learning might be at a disadvantage when working on their independent study or thesis work, there are successful online learning programs at graduate levels where students complete all of the work as required the same as students in traditional classroom. Furthermore, the increasing popularity of online learning at graduate level is increasing annually. Thus, it might be able to conclude that the mode of study or some of the disadvantages of online students might not be obstacles regarding the independent study or thesis work stage.

The current research is a case study of an e-Learning master level programs, the aim is to investigate the methodology, technology, applied by the online learning advisors and students in order to proceed with the independent study and thesis work. The information could be beneficial to anyone who is working on their independent study and thesis work to see the example of methodology and technology that could be applicable. Furthermore, the information would benefit the public view of the work involvement that the online advisors and students are involved when working together to produce a quality project.

## **2) NATURE OF WORKS**

Depending on the institution, the independent study and thesis projects may be quite different. However, the requirement for the two types of work and the depth of the work depends largely on the institutions, academic programs, field of study, as well as the persons that evaluate the work themselves (Mauch & Park, 2003). Both of the projects share a similar traits, which is the work is conducted and completed by a students with the advisor. The interaction and methodology between the advisor and student while working remotely is the focus of the current research.

The process of the work at the institution in the current study requires students to work with the advisors that are assigned to the students by the departments. Students are consulting mainly with the advisors. When the project is completed, the students defend the project in the defense examinations, which are the proposal and final. The proposal and final examination defense could be the only times that the e-Learning students meet the advisor face-to-face. During the independent study or thesis works, the advisor may take many roles such as teacher, mentor, and colleague. Mauch and Park described that the theory of the advisor and students relationship changes from being a student and teacher relationship at the beginning of the work to become senior-junior colleagues type of relationship (Mauch & Park, 2003). The role and tasks for the advisor for providing guidance are similar for both the IS and thesis projects. Both works requires constant review of students' work and providing appropriate feedback in a form of comments toward the draft paper or toward the questions that students have.

## **3) METHODOLOGY**

In order to investigate the method of collaboration between the advisors and students, the researcher decided to employ a qualitative research and use interview as the mode of collecting relevant data. The scope of the research is a case study of an institution that offered online Master level degree programs in Thailand. The institution is known for providing an online degree for over 6 years. Thus, the institution should be able to provide an outlook for the method of advising e-Learning students.

There are four constructs for the data collection. First construct is the process of advising e-Learning students using the information and communication technology. The second construct is the advisor and student attitude toward the information technology and face-to-face meeting. The

last construct is the overall recommendation for advising e-Learning students.

The interview is conducted via different channels, telephone, text-chat, video-conference, and face-to-face meeting. The choices depended on the convenience of the interviewees.

### ***2.1) Behaviors of using communication technology for working on IS / Thesis for e-Learning advisors and students***

For this construct, the researcher focused on how advisors and students started the work together as well as the method of usage of communication technology. The areas of questions that the researcher asked are, the using of technology for communication, submitting of work, providing feedback, receiving comments and other consultation procedures. Furthermore, the computer application or the Internet application that advisors and students employed for working collaboratively was also asked.

### ***2.2) Attitude toward using communication technology and face-to-face meeting***

For the attitude toward the communication technology and face-to-face meeting, the researcher aims to collect advisors' and students' overall attitudes toward both types of interaction. The area of questions that were asked are; the preference toward the face-to-face meeting versus the communication technology, the rationale for having the face-to-face meeting, the opinion toward advantages and disadvantages of face-to-face meeting.

### ***2.3) Frequency of communication***

This section focuses on the frequency of advising students and contacting advisors during the process of working. Although the frequency of interaction varies, depending on the stages of the IS / Thesis work (Mauch & Park, 2003). The researcher aims to gauge the estimation of

frequency of contact that the advisors and students that occurred. In turn, the data might help providing the preferred number that could be apply as guidelines for working successfully.

### ***2.4) Recommendation for other advisors or students***

For the last construct, the researcher aims to capture the respondents overall opinion toward working on the IS /Thesis work for e-Learning students. The recommendation provides opportunities for e-Learning advisors and students to express their experience toward the work that he or she think should be beneficial toward other advisors and students.

## **3) RESULTS AND DISCUSSION**

There were a total of 10 advisors and 3 students agreed to be respondents for the study. All of the students have experience for working on independent study or thesis and use communication technology during the work. The advisors have experiences of advising e-Learning students for a minimum of 3 years and over 5 years. The interview sessions were schedule for each respondent. Each interview last approximately 30 minutes.

The findings reported from advisors and students interview, it shown that the communication technology has been employed toward working collaboratively between the advisors and students.

The level of technology usages among the advisors and students varies greatly. Some advisors may employ both types of synchronous and asynchronous communication. On the other hand, some advisors chose to rely on only asynchronous communication as a supplement to the face-to-face meeting. Although the current practice seems to serve the purpose of advising and working remotely, the current

availability of technology could provide more benefits toward the task.

### ***3.1) Behaviors of using communication technology for advising/working***

From the results, the technology that used the most is a simply e-mail communication. Both the advisors and the students heavily rely on e-mail as the mean of communication. The e-mail can serve as a mean for communication, for delivery of document, and for getting the quick response as well as providing comments. The flexibility of e-mail application also showed when students and advisors were asked about the benefits of the communication technology. The benefits of push communication as the e-mail can be accessed by a mobile devices such as smart phones and the benefits of able to ask or providing comments at anytime. The findings matches with the research of students experiences on online thesis by Suciati, who also reported that e-mail was the main technology for communication and submitting works (Suciati, 2011).

Another notable for the benefit of the communication technology was the reported by a student that the guidance and comments were recorded for later review via the use of Skype text chat. The students also mentioned that the text chat record was how he received comments on the work as well. The presented scenario showed the benefit of the technology that may be better than the face-to-face meeting. If the student was to record everything via face-to-face meeting, the quality of the record may not be as clear since the recording may not be easily capture everything. However, using text chat, every conversation was recorded for later retrieval easily. This not only help students but also help the advisor as well since he or she could recall clearly about what was recommended earlier.

Although social media such as Facebook may seem to be popular and well known at

the time of this research (2012), the benefit of the social media may not be direct toward applying for collaborative working on IS or Thesis. Even a student mention about Facebook as a communication tool, when asked further about the usage of Facebook, the student was not using the Facebook for communicating with advisors regarding the work nor using Facebook for getting help for the work. As a result, it might be safe to conclude that using of social media may not be suitable at this time regarding the IS or thesis work.

The disadvantages of the communication tool could reflect the nature of the asynchronous communication technology. Majority of advisors and students concerned that the message sent through e-mail, which is asynchronous technology, could be misinterpret easily (“Advantages and Disadvantages of Email,” n.d.). They mentioned that in certain cases, the message of commenting on students work could sound negative or offensive to students, which was not intended to. Furthermore, there could be a potential exchange of several messages prior to reaching same understanding. All of the issues showed the disadvantages of asynchronous communication such as e-mail. It may be difficult to find solution for the shortcomings since the nature of individual when writing e-mail could be different.

### ***3.2) Attitude toward face-to-face meeting***

Regarding the attitude of advisors and students toward the face-to-face meeting, both parties seemed to provide variety of opinion toward the construct. Majority of advisor and students believed that the current technology would allow the communication to replace the face-to-face meeting. For those that believe, the reason was because technology that provides synchronous communication such as Skype video chat or Facetime calling could provide the same experience can simulate the face-to-face meeting effectively. On the other

hand, those that do not believe the current technology stated that the face-to-face conversation could not be easily duplicated with the use of technology. For further clarification, the question for the interview asked about the opinion to all people whom may not have experience with using the synchronous communication application at all. As a result, the people who reported based on only the experience of using e-mail as the only mean of communication technology. However, this might worth further investigation regarding the performance of the synchronous communication technology in the future.

Further analysis on the advantages and disadvantages of the face-to-face meeting showed that the advisors and students believed that the meeting provided a better conversation than communication technology. The face-to-face meeting allowed the conversation to be more immediate. Thus, questions and answers can be immediately response. Further explanation can be provided immediately as well.

Another benefit of the face-to-face meeting is to gauge students' performance on the work. As one of the advisors explained that by having a face-to-face conversation with students, the advisor could gauge the students' performance on the work as well as ensuring that the work was done by the student himself or herself.

From the results, it seemed that the advisors and students believed that the face-to-face meeting is more effective for helping students who are not competent or explain the work more in detail. Furthermore, when asking advisor and students regarding reason for having face-to-face meetings, all respondents reported that the meetings were needed for discussing ideas toward the projects or to further explanation in details of the work submitted.

The only disadvantages of face-to-face meeting would be the cost of travel and time spent on appointment and meeting time itself. The traveling and time are the limitation for most e-Learning students since almost all of the students chose the e-Learning as it allowed them to carry on with their full time work and study at the same time. Furthermore, they also stayed in a location that may not easily travel to the campus to meet advisors during the weekdays. As a result, the face-to-face meeting can be difficult for both the students and the advisors since the meeting might have to be at a location and time that may not be convenient for both. One of the advisors reported that the meeting should be worth having since it is difficult to meet the e-Learning students. Thus, the advisors and students should prepare well before meeting face-to-face.

### **3.3) Frequency of communication**

On average, advisors and students reported that they are communicating through communication technology about once a week. In addition, they reported that the frequency was varied depending on the stage of work. In the beginning, the frequency could be higher but the frequency is less once the work is advanced. However, on average, the communication is continuous. The advisors and students reported that the frequency of face-to-face meeting was not frequent and the meeting occurred at the beginning of the works.

### **3.4) Recommendation for e-Learning Advisors and Students**

For the recommendation for e-Learning advisors and students, both groups showed that the constant communication of at least once a week would be necessary. Other recommendation concerns the organization of file and meeting the requirements of the schools and the advisors are other recommendations. The results might show the issue that may be well known among

advisors and students that there were students that might not be able to follow through with the final projects and might stop pursuing the graduation completely. Thus, the recommendation of constantly communicate would be necessary for students to update the advisors on the work progress and for advisors to follow-up with students on previous assignment.

#### **4) CONCLUSION AND FUTURE RECOMMENDATION**

When working on independent study or thesis for e-Learning students and e-Learning advisors, the requirements of constant communication between both parties seem to showed that the technology already allow the work to be completed remotely. Even though not all of the technology available for online collaboration was employed, the work seemed to be possible with only e-mail and word processing software. However, there were reported of difficulties and limitation of communication technology by the advisors and students. The research findings seemed to show that the issues lie for the asynchronous communication tool, which is e-mail.

The current technology that might be able to answer the need for the advisor and students could be in a form of virtual meeting rooms that allow the video meeting but also the presenting and commenting on the work as well. In addition, the virtual meeting is synchronous communication in nature. Furthermore, the tool can allow the recording of the conversation similar to the recording of the text chat. Thus, the experience would be similar to having a face-to-face meeting.

The current research only provides the overview of usages toward the independent study or thesis projects. The results showed usage experiences of positives and negatives of communication technology and face-to-face meeting for e-Learning students and

advisors. For future research, the investigation of effectiveness for different level of communication technology usage might help further identify the best practice for advising e-Learning students.

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## **A Guideline of Social Media Application for the Collaborative Learning in Higher Education**

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### **ABSTRACT**

**Social networking and its impact has led to people being able to learn with the use of modern technology. In general, it has helped collaborative learning flourish because of the benefit of online study groups and so on. This article presents a proposed guideline for higher education instructors to effectively apply those social media in collaborative learning process. Contents cover principles and procedures of social media in learning and teaching; theories of collaborative learning, particularly at tertiary level; concepts of instructional management on the internet; and a proposed guideline of social media application for the collaborative learning in higher education.**

### **Keywords**

Collaborative learning, Higher education, Social media, Social networks

### **1) RATIONALE**

Learning and Teaching in the 21st century in line with the National Education Act B.E. 2542 and 2545, Section 22, requires that provision of learning must be based on the principle that every student can learn and self-develop. Students should be encouraged to develop naturally to their full potential. Also, Section 24 specifies that educational institutions and relevant agencies must arrange activities, learning

environment and facilities in line with interests and aptitudes of students (Office of National Education, 2545).

The Higher Education Commission has announced Thailand Qualifications Framework to serve as a national standard of learning. There are five required areas: moral and ethics; knowledge; intellectual skills, interpersonal relationship and responsibility skills; and numerical analysis, communication and information technology skills.

Teaching and learning approaches in higher education should focus on balance development of students, student-centered, thinking skills, real-life situation, and problem solving. For students, learning must be coordinated and integrated to real life so that they can learn naturally and meaningfully. Thus, integrated education provision has more important role.

A method of collaborative learning is student-centered. It encourages students to think critically and create a new knowledge on their own (Curtis & Robert, 2000). It is applied to both traditional and online instructions to increase efficiency and quality of learning activities. The method focuses on provision of learning environment where students can learn together in small groups. Each member involves in learning activities, takes part in group success, exchanges ideas, shares learning resources, and encourages each other. An individual member is responsible for his/her own learning and

assignment while interacting with members of the group. (Panizt, 2001).

Web 2.0 services, as social networks, contain eight features: the application of collective wisdom, reusable, innovation portfolio, creating a rich experience, integration of multi-device software, continuous function update, the long tail effect, and actuarial saving light framework (Joiner, Nethercott, Hul & Reid, 2006). Web 2.0-based systems provide web users a collaborative creation environment. Researchers have indicated that web 2.0 technologies can also be used to support indoor or outdoor learning activities via mobile devices (Ebner, 2007; Hwang, Tsai, Yang & Criteria, 2008), such that students can learn collaboratively in a virtual community (Laru & Jarvela, 2008). It is expected that such student-centered learning with social interactions can foster students to become self-learners. On the other hand, the role of teachers can be more as a mentor for guiding students to think independently and to participate in collaborative learning actively through discussions, knowledge sharing and problem solving (Chen, 2011).

Social networks widely used for communication are e-mail, facebook, twitter, msn, wiki, youtube and flickr. They are also known as social media. Properties of such technology can be applied to teaching and learning in higher education. The social media can create collaborative learning at anytime and anywhere, connect related knowledge for integration and construction of new knowledge. Therefore, the following guideline on social media application for the collaborative learning in higher education is proposed.

## 2) CONCEPTUAL FRAMEWORK

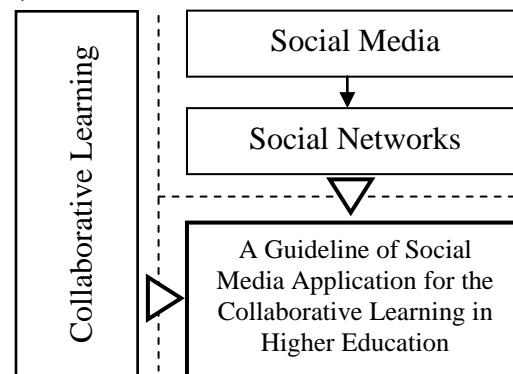


Figure 1: Conceptual Framework of social media application for the collaborative learning in higher education consists of 3 main elements.

### 3.1) The Concept of Collaborative Learning.

Collaborative learning is a process of people working together to achieve a goal set. During activities, each person seeks for outcomes that are beneficial to oneself and members of the group. A method of 'learn together' has been used extensively. Johnson and Johnson (Johnson & Johnson, 1994) have concluded the principle of cooperative learning as follows.

#### 3.1.1 Positive Interdependence.

The positive relationship stems from the recognition that they need to collaborate with team members. All have equal roles and responsibilities. The success of each student as an individual person depends on the success of the group. The group will succeed or not depends on support or positive dependence from all members. The students must take responsibility. Tasks are assigned to achieve the goal set. The instructor plans instructional model that creates positive dependence. The principle is as follows: setting goal together, receiving award together, sharing learning resources, and appointing roles of group members.

### *3.1.2 Face to Face Promotive Interaction*

The students are grouped in mixed ability. They exchange information, and express their opinions in front of a group of friends. The result of group interaction is intellectual activities and interpersonal relationship between students such as explaining how to solve the problem, presenting knowledge among members, explaining the relevance of what they have learned to prior knowledge. Social influence and helping each other occur. The students practice responsibility and reason with friends.

They support each other, respond with words and give feedback, and reinforce members who lack of incentive. These interactions make them work successfully.

### *3.1.3 Individual Accountability.*

The responsibility of each member is considered an important element of collaborative learning. The working group will evaluate the performance. The evaluation will provide learners with feedback. Only the success of all members of the group is considered a success. Each member is responsible for the assignment. Teachers assess whether group members are helping each other, and provide feedback. Do not give the same assignment to working groups. Student responsibility can be assessed by testing individuals or sampling of outputs.

### *3.1.4 Interpersonal and Small-group Skills.*

Students are trained to know and trust each other. They learn to communicate, to accept, to help solving conflicts, and to criticize or make comments relating the idea not the owner of that idea.

### *3.1.5 Group Process.*

The group's output is influenced by the opinion of the group members during working process. The group process occurs when group members discuss the success of working toward objectives while maintain good relationship among members. The group process reflects how

the group works, makes the students confirm their own ideas, and reinforces the desired behavior of each member.

## **3.2) Social media**

### *3.2.1 Learning Through Social Media*

Social media, in this study, are digital technologies that enable social interaction through a variety of forms and channels. Interaction through social media can occur through a variety of ways, from Internet browsers to mobile phones (Boyd & Ellison, 2007). Participation through and with social media is an opening for teens to socially relate with each other in new contexts not limited to school, home, or a fixed time. Participation with and through social media is not limited to building relationships, it can also be driven by specific interests of users (Ito, Horst, Bittanti, Boyd, Herr-Stephenson & Lange, 2008). This includes (but are not limited to) visual arts such as anime and comic art, video editing, photography, creative writing, fandom groups around reality television shows, and other creative activities (Jenkins, 2003, 2006; Jenkins, Clinton, Purushotma, Robison, & Weigel, 2007; Rheingold, 2007).

Participatory cultures have existed long before the Internet and social media (Jenkins, 2006). Yet, social media has amplified the ability for many different kinds of people to gather across time and space to share ideas. Understanding the reciprocal and dynamic systems of teaching and learning found in these types of social media environments requires taking into account an individual's learning (Piaget & Inhelder, 2000) in relationship to the social influences of learning (Vygotske & Cole, 1978). The social influences of learning in classrooms in nothing new (Hagaman, 1990; Wilson, 2004; Wolf, 1993); however, what is new and needed is an understanding of learning that addresses the reciprocal dynamics of

exchanges between individuals and social collectives<sup>2</sup> through social media.

The field of education offers a number of threads regarding digital media research and learning communities. Digital media can be used as a way of critically engaging with visual culture and building communities of resistance (Darts, 2004, 2007) in networked society (Sweeny, 2004). Learning communities have also been organized and supported through the creation of interactive social and ecological justice websites (Julian, 1996; Krug, 1997). Further, learning communities have explored how [AQ: the?] potential of hypertext, hyper aesthetics, and critical pedagogy shape learning in ways that encourage critical thinking and the manipulation of ideas (Taylor, 2000, 2004; Taylor & Carpenter, 2002). Online learning also enables communities to assemble and take on new roles in environments like collaborative virtual museums (Keifer-Boyd, 1997) and has given new opportunities to connect for learners with disabilities (Derby, 2011). This study extends and elaborates Springgay's (2005) theorization of learning through the digital as spaces that shape new processes of knowledge production that are networked and relationally dynamic.

### 3.2.2 Social Media to Support Learning

Table 1: Analysis and synthesis methods of the Social Media to Support Learning.

| <b>Approach</b>             | <b>Category</b>   | <b>Technology</b>  |
|-----------------------------|-------------------|--|
| Conversation /Participation | Micro blogging    | Twitter, Plurk, Pownce, Jaiku  |
|                             | Social Networking | Facebook, Bebo, Avatars United, LinkedIn, MySpace, Orkut, Skyrock, Netlog, Hi5, Friendster, Multiply |
|                             | Discussion        | MSN, Yhoo, Skype   |
| Content Publishing          | Articles          | Slideshare, Scribd, HubPages, ezinearticles  |
|                             | Blogging          | Blogger, LiveJournal, TypePad, WordPress, Podcasts   |
|                             | Wiki's            | Wikipedia, PBwiki, wetpaint, wikia   |
| Sharing                     | Photo Sharing     | Flickr, Photobucket, SmugMug, Zoomr  |
|                             | Video Sharing     | YouTube, Vimeo, Revver   |
|                             | File Sharing      | mediafire, 4shared, One2car  |
| Search Engine               |                   | Google, Yahoo  |
| Evaluation                  |                   | Googledoc, Mankey server   |

### 3.3) Instructional System Design

Instructional system design of the concept of (Kemp, 1985) proposed 10 elements: learning needs, topics or job tasks and general purposes, learner characteristics, subject content task analysis, learning objective, teaching/learning activities, instructional resources, support services, learning evaluation, and pretesting.

Elements of a system are collection of things that man has created to achieve the goals (Banathy, 1968) In order to fully function, a system must consist of 5 major parts input, process, product, control, and feedback (Tissana, 2547).

### 4) METHODOLOGY

The stages of the Guideline of Social Media Application for the Collaborative Learning in Higher Education are as follows.

4.1) Study related documents, concepts, principles, and research studies, then analyze and synthesize to set the procedure of organizing instructional model.

4.2) Bring data from a study to construct a draft model of the Guideline of Social

Media Application for the Collaborative Learning in Higher Education which has 5 steps.

4.2.1 *Input*. There are 6 sub-elements: 1) determine instructional objectives, 2) prepare environment readiness, 3) design content of the lesson, 4) determine social media, 5) determine roles of the teacher, and 6) determine roles of the learner.

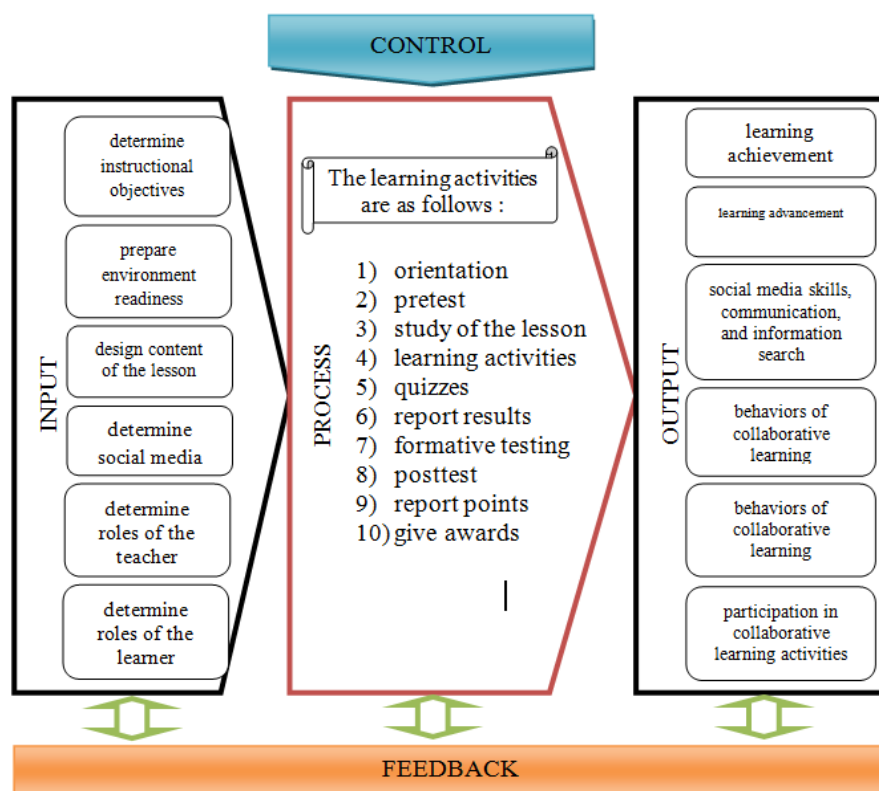
4.2.2 *Process*. There are 10 sub-elements: 1) orientation, 2) pretest, 3) study of the lesson, 4) learning activities, 5) quizzes, 6) report results, 7) formative testing, 8) posttest, 9) report points, and 10) give awards

4.2.3 *Output*. There are 6 sub-elements: 1) learning achievement, 2) learning advancement, 3) social media skills, communication, and information search, 4) satisfaction of students with collaborative learning, 5) behaviors of collaborative learning, 6) participation in collaborative learning activities.

4.2.4 *Control*. Monitoring activities and control duration of learning sessions.

4.2.5 *Feedback*. Providing feedback for improvement.

Figure 2: A Guideline of Social Media Application for the Collaborative Learning in Higher Education



## 5. CONCLUSIONS

This proposed guideline model needs to be put into further steps including reviewed and certified by experts, then implement to appropriate courses in higher education. It is expected that the model will encourage students to develop themselves in various areas such as teamwork, responsibility, and sharing,

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## **Taking Australia's premium MBA program online through blended learning**

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### **ABSTRACT**

**Macquarie University's Graduate School of Management (MGSM) faced a hurdle while transitioning from Blackboard to Moodle. However, the AMQ e-Learning team, helped re-think approaches to learning and teaching and to convert a face to face delivery into a blended learning product by basing their design approach on best practice and research. This paper summarizes the Processes, the Instructional Design and the Learning Object's Features.**

### **Keywords**

**blended learning, change management, e-Learning project scoping, MBA, Prince2, scalable development**

### **1) INTRODUCTION**

Creating a blended learning program for Macquarie Graduate school of Management (MGSM) required careful consideration of the school's strengths, culture and reputation and had to be seen as an enhancement opportunity. This paper looks at large e-Learning project processes, the design and features giving insight into e-Learning projects based on design science research (Kirschner, Carr, & van Merriënboer, 2002, p. 97) resulting in an innovative Master's of Business and Administration (MBA) program through a learning management system (LMS).

#### **1.1) Background**

In 2011, MGSM was informed that Macquarie University will be migrating from Blackboard to Moodle. MGSM

lecturers were peripherally aware of their LMS, using it as a document repository. The MGSM team was introduced to the e-Learning team at Access Macquarie (AMQ) - a wholly owned entity of MU, which provides professional instructional design and e-Learning development specializing on the Moodle platform. AMQ's expertise was sought to migrate to Moodle and to create a new MBA delivery.

### **2) PROCESSES**

#### **2.1) Program evaluation and change management**

In education, change management though never easy, can be successful if it takes the form of program evaluation. The faculty can relate well to change management if it is defined as a process that seeks to improve quality and is 'a process of knowledge production' (Owen, 2006, p. 3). To that end, Owen's Proactive form of evaluation (2006, p. 50) was used by conducting a needs assessment and market analysis. This involved faculty members, management and MGSM instructional designers in a 2 day workshop to provide strategic definitions to project elements of e-Learning such as aims, objectives, resources and models (Fee, 2009, p. 65). Some of the outcomes are described below.

##### *2.1.1 Blended learning*

MGSM was not keen on self-paced distance education. That was seen as a decrease in quality, because an MBA program requires and is valued because of interaction between professionals. The workshop confirmed that MGSM is more



in line with a social method of learning i.e. Anna Sfard's participation metaphor (1998, p. 6) and furthermore with the knowledge creation metaphor as MGSM's learners need to collaborate to not only apply their knowledge but also incorporate new ideas and concepts (Paavola & Hakkarainen, 2005, pp. 539-540). Hence a self-paced distance education program would not maintain that value but blended learning could provide the best of both worlds.

### 2.1.2 Which Units to develop first

This was an administrative decision, but not an arbitrary one. The focus was on 3 core units, as an MBA can be achieved through a Graduate Certificate - 3 core units - and then a Graduate diploma - another 3 core units - (MGSM, 2012).

### 2.1.3 Defining roles and responsibilities

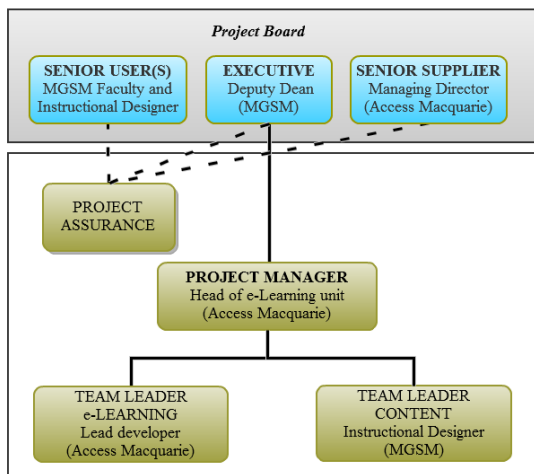


Figure 4: Prince 2 adaptation to project

Prince2 (P2) was determined as the most appropriate project management methodology and so, the *Project Board* and management team (see Figure 1) had to be determined (Murray, et al., 2009, p. 33). P2 works well in education because it relates intuitively to the program evaluation processes since it is easily adapted to logic model development i.e. identifying resources, activities, outputs, outcomes and impacts (W.K. Kellogg Foundation, 2004, p. 25). Furthermore, P2's principle of

learning from experience resonates with faculty that looks to institutionalize lessons learned (Schindler & Eppler, 2003, p. 225) by integrating reflection on current program into the new one.

### 2.1.4 Identifying templates

Finally, MGSM unit similarities and differences had to be identified. All units consist of 10 lessons; all have lectures, assignments, readings, and examinations. To facilitate design, the content was broken into 3 categories (Collis & Moonen, 2001, p. 89), (1) pre-lesson (2) in lesson (3) post lesson. Furthermore units were modularized; though when put together the 10 lessons constitute a cohesive unit, each could also stand on its own. The units varied in style (theoretical, mathematical, or practical) some using books while others course notes provided by faculty.

## 3) INSTRUCTIONAL DESIGN

### 3.1) Principles of Design

The instructional design processes above were derived from and supported by Visscher-Voerman's (VV) 16 design principles (Kirschner, Carr, & van Merriënboer, 2002, p. 97) – a process that resonates well in an academic setting. Some will be detailed here.

#### 3.1.1 Design by stages (VV principle 2)

Stage design is both a P2 (Murray, et al., 2009, p. 13) and VV principle that was deemed important to break up the project in stages and plan only one at a time, to properly learn from each stage.

#### 3.1.2 Creating ownership and inclusive design (VV principles 3 and 6)

The designers took care to create ownership with the academics, as they will be the ones delivering the content and despite AMQ's instructional design expertise, input was solicited from academics into both content and design.

### 3.1.4 Visible creativity (VV principle 11)

Out of box deployment of a Moodle platform, is not very visually pleasing. Care was taken to leverage the features of the Moodle platform, but to also make an artistic rendering of a user interface creating an intuitive user experience and reflecting the MGSM corporate brand.

### 3.1.5 Learner needs (VV principle 13)

Though the final product was structured around units and topics, the learner needs were prioritized in terms of flexibility features and intuitive navigation.

## 3.2) Practicalities and Features

A major design decision was driven by the student needs. Goodyear talks about the ‘decline of the compliant learner’ (2000, pp. 4-5) as a trend in education whereby we can no longer expect learners to behave in predictable patterns. MGSM students increasingly find it difficult to commit to a campus experience. They were clearly no longer *compliant* and needed a more flexible delivery that incorporates elements of informal learning such as the learner’s ability to decide not just the logistics of *how*, *when* and *format* but also to self ‘organize and manage their own learning’ (Hart, 2011, p. 17). Another important aspect of design relates to another of Goodyear’s paradigms of ‘environments for activities’ (2000, p. 6) so that the MGSM content is designed to become a platform that reflects real life. In terms of content that meant applying authentic design characteristics by ensuring activities do not just reflect real life, but ‘provide a sustained and complex learning setting’ (Herrington, Reeves, & Oliver, 2010, p. 21). In terms of design, this meant a modular semi synchronous course.

### 3.2.1 Semi Synchronous mode of delivery

The selected model blends synchronous and asynchronous delivery. Though lessons

will still be offered in classrooms, text and online video content acts as a substitute. Nevertheless, students have to remain in synch with peers; when taking a unit, the learners no matter where they are located, will have to complete the unit at the same time. Though they will not have to commit to lectures, they need to progress one topic per week ensuring syndicate group work can occur; their collaboration might not happen face to face exclusively, but could involve, collaboration on projects through wikis which as research suggests are ideal for higher education collaborative projects (Bruen, Fitzpatrick, Gormley, Harvey, & McAvinia, 2010, p. 110). The principal driver of the semi-synchronous mode of delivery was to provide students with more flexibility, preserve the quality of the program that relies on close collaboration and allow them to leverage the benefits of creating a knowledge building community (Scardamalia & Bereiter, 2006, p. 98).

### 3.2.2 Modularity

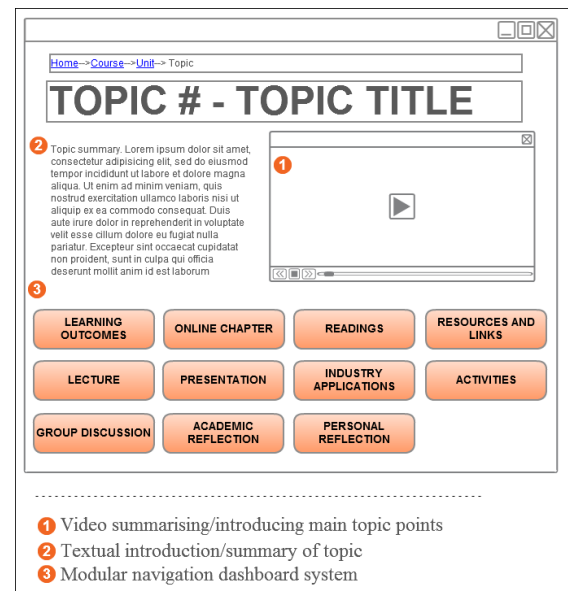


Figure 5: Topic (lesson) template GUI

Modularity was achieved by breaking up a unit into its 10 topics, ensuring each topic is self-contained, and then breaking up the content further. As seen in Figure 5, learners can alternate between *outcomes*, *readings*, *activities* and *reflection blogs*,

providing them with ‘just in time learning’ (Goodyear, 2000, p. 4) i.e. interrupting studies and seamlessly returning to them, a feature prized by busy executives. This also reflects how they work and expect to be taught (Kirschner, Carr, & van Merriënboer, 2002, p. 88). Today’s executives often work with easy to navigate to and from dashboard systems, and the design template simulates that.

### 3.3) Issues

#### 3.3.1 Lecturer workload

Lecturers worried about forums, which they saw as a replacement for emails. From a design perspective, forums provide a value add to students and a reduced workload for lecturers. The forums were made public so that lecturers may initiate a discussion, and participants respond to the main topics by posting and replying to their peers’ posts. Hence a community is re-enforced, and lecturers only have to summarize collective thoughts and answer questions in one go which benefits all.

#### 3.3.2 Quality

The content was classified as: (1) assessments/activities (2) readings (3) video content. As a design decision, assessments and activities have to be updated on a yearly basis. To that end lecturers were taught how to be self-reliant within Moodle. The course notes were scheduled for review once every 3 years. Finally video content was scheduled for review once every 5 years. Any references to temporal proximity (e.g. recent events), were removed from scripts in order to give the videos the longest possible shelf life. Furthermore quality is re-enforced by minimizing static content (provided in advance through the LMS). Learners are encouraged to create their own knowledge while the LMS is used as a launching pad to explore other readings, and to collaborate. Keeping the content to a minimum also reduces update related overheads.

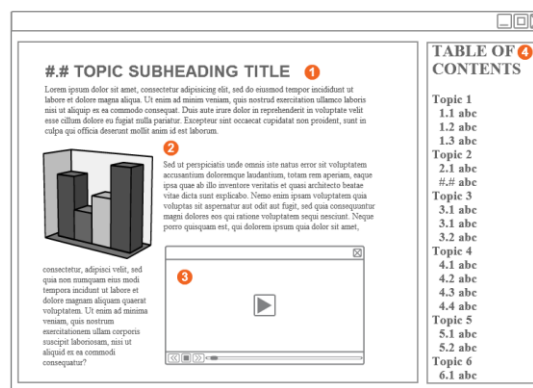
## 4) LEARNING OBJECTS

Some of the more relevant features will be explored here.

### 4.1) Learning Outcomes

The learning outcomes are represented by the first top left element (see Figure 5) that once clicked states what abilities the learners will develop. AMQ’s experience with design in the English as a Second Language field, demonstrated the value of *can-do statements* (Council of Europe, 2011, p. 244) inspired by the Common European Framework. This feature re-enforces the modularity of the unit, allowing learners to (1) get a sense of progression (2) quickly re-engage with the content if they set it aside for a while and (3) offer them a mechanism to reflect.

### 4.2) Online Chapter



- 1 Immediate localisation
- 2 Improved and thorough imagery
- 3 Animated images
- 4 Link to other units

Figure 6: eBook objects

The online chapter was designed with intuitive and useful navigation addressing missing Moodle features. The online chapter (Figure 6), is accessed by clicking the online chapter button (Figure 5). Doing so, learners are directed to a topic, so that button acts like a physical bookmark allowing learners to continue where they left off. The table of contents to the right, highlights the current section, and puts the topic in context while allowing navigation

to other topics. Images were inserted in the image sparse content, and some images were animated for greater effect. Research points to cognitive benefits of images that learners remember better and longer (Levin & Mayer, 1993, p. 96), and consequently insertion of more meaningful diagrams and images was emphasized.

### **4.3) Activities**

The activities, present in every topic of a unit, are where most of the internalization and group collaboration occurs. Though learners progress one topic at a time, the knowledge is 'organized around problems rather than topics' (Scardamalia & Bereiter, 2006, p. 101), making it more relevant and applicable to learners. Examples of activities include financial spreadsheets that need to be analyzed, or case studies related to current company financial statements. Learners collaborate in their syndicate groups by working on reports through a wiki which reflects the need to provide flexibility to geographically dispersed groups, and the cross border collaborative nature of work of today's executives. The activities are meant to convey that working on an MGSM group task is a realistic replica of what these learners are likely to experience as graduates.

### **4.4) Reflection**

Reflection activities take two forms: structured and personal. The personal reflection activities are blogs that students keep as they progress through the unit. Lecturers keep a blog to reflect on their teaching and note anything of relevance to improve their delivery or content. The quality principles outlined above coupled with the lecturer reflection allows for iterative and ongoing design that research indicates is the way to ensure continuous improvement (Scardamalia & Bereiter, 2006, p. 100). Structured reflection activities are forums, in the pre and post lesson content where lecturers ask

questions making a link between the upcoming topic and the learner's own experiences. At that time the learners would not have yet read the weekly chapter or would not have internalized it fully but would derive value from activating prior knowledge which has been shown as beneficial for learning of new knowledge (McInerney & McInerney, 2002, p. 82). In the post lesson space, the forums are initiated by lecturer, asking learners to reflect on the readings, lectures or videos, their initial post and their experience. In both cases learners are encouraged to engage with peers allowing professionals from varying backgrounds to benefit from the perspective of others. This design facilitates higher value double loop learning (DLL) (Argyris & Schon, 1996, p. 20); where in the pre-lesson forums learners make use of existing knowledge without questioning their underlying values (referred to as single loop learning), and by the time they go through the week's content, and engage with peers who might challenge their world-view in post lesson forums, they can potentially engage in DLL.

## **5) CONCLUSION**

The project of creating a blended learning MBA program, illustrates 3 elements of a successful large scale e-Learning project in the higher education space. First is the selection and tailoring of a project management methodology that is compatible with an academic environment, Instructional Design practice, and research based development. Second, it is important to identify and adhere to best design principles that include stakeholders, and focus on authentic tasks. Finally the design itself must clearly integrate and demonstrate these best practices by producing through iteration an e-Learning product that incorporates social constructivist features and is mindful of technicalities such as intuitive use and ease of navigation.

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## **Comparison of Learning Achievement on Circuit Analysis by Mesh Current Method via the Internet between Different Feedbacks**

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### **ABSTRACT**

This research aimed to compare learning achievements of students who had different feedback methods and to study the satisfaction of students who had learning activities via website which has 2 types of feedback methods and 2 types of display. The sampling group was 68 of 1<sup>st</sup> year vocational certificate students. This sampling group was separated into 4 groups as follows: 1. Learning via the website which has solution before test feedback method and private displaying 2. Learning via the website which has solution before test feedback method and public displaying 3. Learning via the website which has solution after test feedback method and private displaying 4. Learning via the website which has solution after test feedback method and public displaying. The learning achievement comparison of each group was analyzed by two-way analysis of variance. This found that students who had private or public display did not get different learning achievements while students who had solution before and after test had different learning achievements. The satisfaction of students who had learning activities via website was in a good level.

### **Keywords**

Learning Website, Circuit Analysis using Mesh Current Method, Feedback

### **1) INTRODUCTION**

At present, learning process management focuses on the learners by providing the chance to choose their learning according to their aptitude and interesting, encouraging them to participate in the learning process, developing their ability to pursue knowledge and applying knowledge to fully develop their potential. There are several methods to help the learners to learn and develop their skills such as descriptive teaching, practical skill teaching, discussing teaching, seminar teaching as well as teaching by self studying. For the subject of Electrical Circuit 1 This knowledge is important for electrician student. The subject is basic knowledge in electrical field. These subjects are learning by doing. On the other hand, it must have calculated skill.

Consequently, researcher makes instruction media for selecting. The content is circuit analysis by mesh current method. That has feedback result for helping student. Feedback result education can help learning development. Moreover, it has better achievement. So, it can use effective education. That is advantage for student, teacher and other in electrical field.

### **2) THEORY AND RELATED RESEARCH**

#### **2.1) The subject of Electrical Circuit 1**

According to vocational diploma course 2002 (revised 2003), Office of Vocational

Education Commission, Ministry of Education, subject area of electrical power, electrical power department, subject of Electrical Circuit 1 code 2104-2102, 3 units is classified in vocational group. The subject is taught 5 periods in weekly. For internet lesson of Electrical Circuit 1 is created into 6 sections.

**2.2) Teaching and Learning through web**  
Teaching and learning through web or teaching assistant web is teaching and learning based on World Wide Web. Therefore, www is mediator between instructor and learner in multi dimension media. It is the part of structure. In addition, various attribution and resource in www enhance the teaching and learning process with unlimited time and place under internet network system.

**2.3) Adobe Photoshop CS 3**

Photoshop is program used for creating and refurbishing image. It is popular at present because it can work effectively and can be easily understood.

**2.4) PHP**

PHP is PHP Hypertext Preprocessor which is one type of script language called Server Side Script processing at server side then sending the results to client side via web browser. It is very popular for work development on web called Web Development or Web Programming

**2.5) MySQL**

MySQL is Database Server suitable for medium organization with not much data and also it is relative database management system which is such a freeware database that it is very popular now.

**3) RESEARCH PROCEDURE**

**3.1) Instrument creation procedure**

- 3.1.1 Create learning lesson on internet
- 3.1.2 Create test creation and evaluate efficiency
- 3.1.3 Create quality assessment form for

lesson on internet

3.1.4 Create questionnaire of students' satisfaction

**3.2) Trial**

- 3.2.1 Trial with sample group
- 3.2.2 Trial with sample group was separated into 4 groups

**3.3) Conduct the experiment and collect data**

The lesson through internet on subject of Electrical Circuit 1 verified by academic and media production experts is conducted in sample group and small group. Then, compare of self access learning through internet on the subject of Electrical Circuit 1.

**4) DATA ANALYSIS**

**4.1) Lesson analysis on internet**

Table 1: Lesson analysis on internet

| Efficiency                  | Full score | $\bar{X}$ | %     |
|-----------------------------|------------|-----------|-------|
| Process efficiency (E1)     | 3,379      | 49.69     | 82.81 |
| Achievement efficiency (E2) | 3,331      | 48.98     | 81.64 |

4.2) Academic achievement analysis pre and post applying self access learning on internet

Table 2 : Academic achievement analysis pre and post applying self access learning on internet

|               | Detail    |      |           |      | Total Average |      |
|---------------|-----------|------|-----------|------|---------------|------|
|               | C         |      | D         |      | $\bar{X}$     | SD   |
|               | $\bar{X}$ | SD   | $\bar{X}$ | SD   |               |      |
| A             | 50.16     | 3.38 | 49.95     | 3.51 | 50.05         | 3.40 |
| B             | 46.62     | 1.36 | 48.78     | 3.09 | 47.63         | 2.53 |
| Total Average | 48.50     | 3.15 | 49.47     | 3.35 | 48.98         | 3.26 |

*Note:* A = Learning via the website which has solution before test feedback method

B = Learning via the website which has solution after test feedback method

C = Private displaying

D = Public displaying

## 5) CONCLUSION

This research can be concluded as follow:  
This found that students who had private or public display did not get different learning achievements while students who had solution before and after test had different learning achievements. The satisfaction of students who had learning activities via website was in a good level.

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## **Enhance motivation in online knowledge sharing: how to adapt social networking and web applications as scrapbook concept for digital storytelling**

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### **ABSTRACT**

**In knowledge sharing process, storytelling is one of the most popular methods because it helps people gathering idea and best practice from group members' experiences through their working story. Many people have interesting idea or best practice in their work but they do not realize about it. Storytelling helps them to tell real experience from their mind which sometimes more meaningful than the principle in the books. It's is the reflection of real process from their work. Normally, knowledge sharing requires members come to join together in face to face for storytelling and discussion that make its discomfort for participation, by using online tools for support knowledge sharing from anywhere anytime can solve such problem. Many social network and web applications, such as collaborative documents and presentation, authoring tools, online community tools, or online whiteboard can adapt as scrapbook concept for supported digital storytelling in online knowledge sharing. Scrapbook is the tools that can help people to share their story from photos, journaling and embellishments as working diary or office bulletin board. They can create its stand alone by themselves or help create together in social network or web application.**

**Digital Storytelling through collaborative scrapbook make people fun from showing their idea and creativity from composition and decoration more than telling their story through the text with a little picture. Moreover, it makes other people interested in other people's story and gain attention in knowledge sharing too.**

### **Keywords**

Online knowledge sharing,  
Digital storytelling, Social networking,  
Web applications, Scrapbook

### **1) INTRODUCTION**

In organization, many people have interesting practice or some situations in their work that can be the good case that other people can study and adapt for working but they do not realize about it. That is very valuable knowledge for increasing efficiency in work. In order to transfer that tacit knowledge to explicit in knowledge sharing, storytelling is the one of the most popular method. But normally storytelling has some limitation from face-to-face situation that must use time and place for discussion. From that reason, social networking and web application have advantage for support storytelling from anywhere anytime trough various communication tools. In this article will present about how to adapt social networking and web applications as scrapbook concept for digital storytelling in knowledge sharing. The authors expect this article can be the useful guideline for online knowledge sharing.

## 2) SOCIAL NETWORKING AND WEB APPLICATION

Social networking use web-based technology to encourage large scale connections between interested people. They offer an interactive, user summated network of friend, personal profiles, blogs, group, photos, music, and videos internationally. This attracts more people to share their perspective on topic and emerging conversation (Mason and Rennie, 2008; Winkelen and Mckenzie, 2011).

Web application is the program written to run under the manufacturer's web server and can be run programs and various functions on web browser. The user's data will be installed and stored on the server instead of download and install them on users' computers (Fowler and Stanwick, 2004; Vora, 2009). For instance, Google is developing Google Docs for document management as well as MS-Office or OpenOffice. YouTube, the video sharing website have functions for online video editing same as other video editing software. And Flickr, the photo sharing website can photo editing on web browser as well as photo editing software for PC. Most of web applications are available for free charge. But it's powerful enough for general use, accessible and easy use for users. Those make web application becoming very popular now.

Social networking and web application concept are alike. Many social networking including many application tools for work too. But main objectives of social networking such as blog, wiki, and facebook are communication and information distribution. As for web application such as Google docs, main objectives intend for working more than social communication. However, sometimes these two are integrating together and barely notice the difference.

## 3) WHAT IS DIGITAL STORYTELLING?

Digital storytelling is an activity that gives opportunities for people to express their experiences through various digital media such as text, sound, picture, and animation (Ohler, 2008). It help the people learning by analyzing the stories from their own stories and other tellers' story because the stories from storytelling are real situation without theory or personal opinion that come from people real performance. We can learn a lot of knowledge and idea from those stories from thinking and analyzing the stories. Additionally, digital storytelling can reduce some limitations in face-to-face storytelling. Because storytellers may feel too nervous to tell their story in front other peoples within a time limit that cause storytelling less efficacy. If we use digital media to support storytelling, storyteller can prepare themselves and make other people interesting in stories from digital media. Furthermore, it's can revise many time when the groups need for discussion or expanding. Advantage of digital storytelling is help people to expand the capabilities of computer literacy, media literacy, information literacy and creativity from storytelling by crating digital media too.

The processes of digital storytelling are same as traditional storytelling. McDrury and Alterio (2003) have discussed the process of learning through storytelling following these five steps.

**1) Story finding** the story for telling should have an urgent to tell high in emotional content. Something about a situation excites, upsets or intrigues us.

**2) Story telling** In this stage, teller and listeners focus on organizing and ordering content. Stories are told and listened to for the purpose of understanding the story itself.

**3) Story expanding** The key point at this stage is to share what they learned during the storytelling for link their past experience with the new things that they learn from the stories together.

**4) Story processing** To learn in depth is required to reflective activity. A key focus of this stage where the focus shift to working with meaning and, in particular, developing, through reflective dialogue, multiple perspectives of events.

**5) Story reconstructing** In this final stage, tellers and listeners demonstrate an ability to interrogate stories critically from as many perspective as possible. And adapt new knowledge that they learn from the storytelling in other situation.

Digital storytelling is not limited to the presentation of the story. People can use any tool in the production of digital media. They can mix of text, images, audio, video and animation to present their stories. Social networking and web application are digital media that can use for digital telling too. Using social networking and web application help people can storytelling form anywhere anytime trough internet and other people can access to see the stories from anywhere anytime too. Moreover, many social networking and web application is easy use, flexible access, and compatible. It's not requiring high computer and internet skill for using. Last, it's free of charge.

#### 4) WHY IS SCRAPBOOK?

Classical scrapbooks are albums into which flat physical items (e.g. photographs) or written notes can be pasted with decoration items. The creation of physical scrapbooks evolved beyond the basic hobby of pasting newspaper clippings, magazine articles and photographs in books (West, D., Quigley, A. and Kay, J., 2007). Scrapbook is

creating for recalling, sharing and reviewing their memories of life experiences. This concept is consistent with objective of storytelling. We can adapt this idea for digital storytelling. Making scrapbook help people to arrange their work experience and expression their creativity from designing and making. However, the physical scrapbook has some of disadvantages compared with digital media such as the way to sharing with other people, no easy way for multiple individuals to creating, limited media, hard to search and cost of decoration. These limitations can be solved by creating digital scrapbook from online tools in social networking and web application. Besides, it's easy for sharing your scrapbook to other people; other people easy to visit; several of presentation styles that make storytelling interesting more than listening from storyteller only.



Figure 1: Classical scrapbooks



Figure 2: Danial's scrapbook in LongKrung television show

## 5) HOW TO CREATING COLLABORATIVE SCRAPBOOK BY SOCIAL NETWORKING AND WEB APPLICATION

Many social networking and web application can adapt for creating scrapbook. Most have similar concept. So author would like to give examples to guide how creating scrapbook from social networking and web application as follow.

### 5.1) linoit.com

“lino is a web-based sticky note service. This service provides its registered users (lino users) with virtual stickies operable on a web browser along with “canvas”, a user specific bulletin board-like online area. Both lino users and non-registered users (guests) can post stickies on a canvas, and relocate or remove them when needed.” (linoit.com)

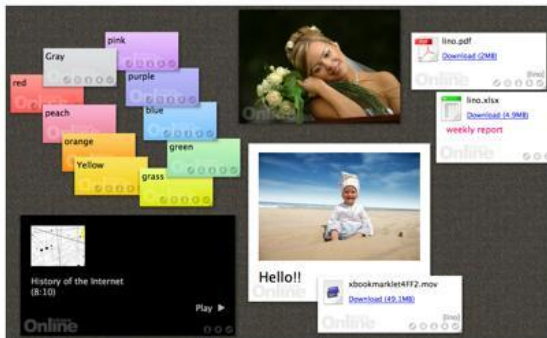


Figure 3: lino's interface

lino's sticky note can insert several media such as text, picture, video, and document file in to the big canvas. Normally, it use as bulletin board style for exchange information. But we can adapt it to make scrapbook because it have same concept as well as cut and pasted of scrapbook.

We can use lino for digital storytelling in many style such as using to tell your own story, using collaborative storytelling in same topic, or using as the place for discussion your storytelling etc.

I would like to introduce some interesting canvas as guideline.

Nicliana use her canvas to exchange her group logo design with her friend.



Figure 4: Nicliana's canvas (<http://linoit.com/users/nicliana/canvases/Our%20logos>)

Jhalon use his canvas to tell about tsunami disaster from his stories and feeling with picture and video.



Figure 5: Jhalon's canvas <http://linoit.com/users/jhalon/canvases/How%20Tsunami>

TeachHub use their canvas to share about recommended teacher movies. Many people suggest movies and their opinion about those movies.



Figure 6: TeachHub's canvas (<http://linoit.com/users/teachhub/canvases/Teacher%20Movies>)

### 3.2) Google Docs

*“Google Docs is a suite of products that lets you create different kinds of online documents, work on them in real time with other people, and store your documents and your other files -- all online, and all for free. With an Internet connection, you can access your documents and files from any computer, anywhere in the world. (There's even some work you can do without an Internet connection!)”* (docs.google.com)

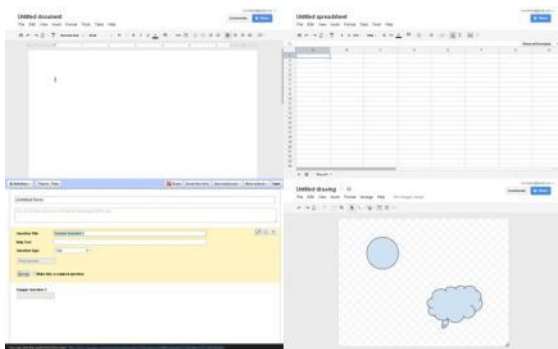


Figure 7: Google Docs Products

In Google Docs products, we can adapt it to create in many styles depending on your creativity.

Google documents and Google drawings can use for creating collaborative scrapbook as well. They can draw objects and insert text and picture in document or canvas. Moreover, they can share and edit object and drawings with your friends and coworkers too. The main different of these two is the products of Google documents is document or website. But Google drawings products will publish to picture.

Google drawings is freely in design more than Google documents. But Google documents is more comfortable in composition layout from using table. These two are suitable for creating scrapbook in album, book, board, poster, newsletter, or newspaper style.



Figure 8: Example of creating scrapbook by Google documents

Google presentations have higher advantage for creating scrapbook as multimedia more than Google documents and Google drawings because it can insert video from YouTube into slide. You can upload sound and video in YouTube and insert into slide for help storytelling. In addition, it can publish and embed your presentations in a website, allowing access to a wide audience too.

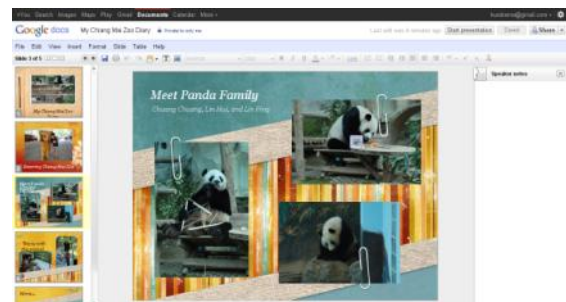


Figure 9: Example of creating scrapbook by Google presentations

From these two examples, I hope it allows you can visualize how to adapt this concept to create scrapbook in other social networking and web application that have the big canvas for drawing and insert various media. For example, online presentation creators as Prezi, Slidrocket, and Empressr, online whiteboard like Scriblink and Dabbleboard, or online mind mapping like bubbl.us and spiderscribd.net.



Figure 10: Prezi's interface

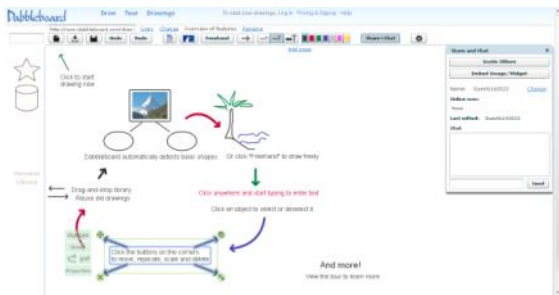


Figure 11: Dabbleboard's interface



Figure 12: Spiderscribd.net's interface

## 6) CONCLUSIONS

Social networking and web application that author suggested is a little of a lot social networking and web application on internet. There may be more appropriate to your situation. However, they are not different much. You can adapt this scrapbook concept for gain motivation in storytelling.

Digital storytelling helps to expanse of the method of knowledge sharing from various social networking and web application on internet. It's solved limitation of face-to-face knowledge sharing and gains people motivation in knowledge sharing from creative storytelling by making scrapbook to tell their own stories. And other people will be interested in stories from variety of media in digital storytelling.

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## **Bridging the Gap of ICT Adoption in Business**

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### **ABSTRACT**

The advancement in Information and Communication Technology (ICT) has become one of a key factor for economic growth and sustainable development of the nation. However, bringing ICT to the needs of business requires skilled professionals. Intertwine with the potency of business and the acquiring of ICT, education has played an important role to create human capital to meet the demand of business. This research aimed to examine the perceptions of ICT supervisors in the difference between demand and supply in professional competency, personality, and moral/ethics of ICT professionals. The attitude of ICT professionals towards factors related to their performance was assembled. The delineation resulted in feedback to education sector which is an important part of a potential mechanism to drive the country into modern economy. Two hypotheses were defined 1) to test the correlation between the demand of employers and the satisfaction of ICT professional productivity in terms of personality, professional competency, and moral/ethics 2) to investigate factors related to the improvement of their performance. Test results reveal that overall professional skills are below expectation and factors affected ICT professional performance are teaching models, training, ethics and learning facilities at statistically significant below 0.05. Suggestions conduce to the improvement of academic process and efficient pattern for modern education: e-education as an alternatives for bridging the gap at more practical level.

### **Keywords**

Business, competency, ICT professional

### **1) INTRODUCTION**

ICT is widely diffused and used as a formidable tool to close the gap between the developing world and the developed world. The contribution of new technology to economic growth has been rendered as an essential element of competition (Porter, 1985). But in the light of experiences, the use of ICT itself cannot ensure the success. Main player to strengthen the future of business has been designated as ICT professionals. However the predicted demand outstrips the supply. Even the number of graduates tends to increase, no evidence that the needs has been fulfilled. The imbalance between ICT demand and supply causes many researchers' attention to rummage more understanding on the ICT skill shortage and find definitive advice for education institutes. Qualified ICT professionals are viewed as weakness endangered to the possibility of shaping the future of business (Ministry of Information and Communication Technology, 2009). Therefore, a need to reduce barrier in deploying ICT in business required a sustainable participation of government, educators and ICT professionals themselves. Human capital, one of the seven facets required for business explication need to be discipline-specific on future emerging skills and quality (Keen, 1985).

### **2) PROBLEMS IDENTIFICATION**

The growing needs for ICT calibers with explicit skills in management, research and applications has significantly impacted to the technology society (Agyemang, 2008).

Education seems to be a crucial component to reduce the burden (Osterwalder, 2010), causing a growing acceptance among academics, education policy-makers, and employer groups that the development of graduate skills is part of the role of higher education. Therefore the nation long-term education plan focusing on increasing ratio of science students: humanity and social science to 60:40 was released (Rattananukul, 2011) following by the ICT Master Plan targeting at improving the quality of ICT personal.

However, this approach was still unsuccessfully achieved. The outcome of higher education failed to accommodate the demand. New graduates incapacitated to work abruptly (Suksiriserekul, 2008). Job coaching is immensely required, reflecting the declination on quality of ICT students. A huge gap between the academics version and the entrepreneur version of ICT curriculum still exists. Even academics are trying to adjust the contents, graduates are still unable to meet the needs of industry forasmuch as the educational process remain too focus on teaching theories while business focused on experience and technical expertise. Moreover, Graduates with only a degree will no longer serve the expectation. Other attributes such as self-confidence, knowledge, abilities, expertise and personality for eg: the ability to communicate and apply appropriate technology tools are in great demand (Debusse, J et al., 2009, and Miliszewska et al., 2008).

The ambivalence in terms of demand and output has grasped the attention of researcher to study the expectations of ICT employers in factors related to performance of their subordinates in core generic skills defined as ethics and moral, professional knowledge, cognitive skills, interpersonal skills and responsibility, numerical analysis, communication and information technology (TQF-Computers,

2009) .Two hypotheses were designated 1) to test the correlation between the expectation of employers and the satisfaction of ICT professional productivity in professional competency, personality, and moral/ethics 2) To extract factors affected performance of ICT graduates, variables include pedagogue, curriculum and institute. The study focused on studying professionals graduated in Information Technology which consisted of 4 main areas: Computer Science, Computer Engineering, Software Engineering and Information Technology. (Commission on Higher Education Committee, 2009) which consisted of approximately 605 educational programs if classify by program name (Chutimasakul, 2008).

### **3) METHODOLOGY AND DATA COLLECTION**

Quantitative and qualitative research methodologies were embraced. The questionnaires were designed based on two prominent thoughts on National Education Plan, and Economic and Social Development Plan targeting to: 1) assess the expectation and verity of employers on skills, personality and moral/ethics of ICT professionals 2) investigate attitudes of ICT professionals (1-5 years experience) on factors affected performance including curriculum, pedagogue, and the institute itself. Data Triangulation was adopted through documentary research and semi-structured interviews with selected executives, educators in universities responsible for the establishment of curriculum, ICT professionals, and ICT students. Questions covered admission criteria, curriculum, teaching/learning facilities, attributes, experience and stratagem to improve quality of educators. The expectation of the outcome and attitudes towards the educational process of educators and employers was investigated. The consequence of the research resulted in the practical guidelines



to improve productivity and quality of ICT professionals and feedback from business shall truly be applied to improve the academic process.

#### 4) FACT FINDINGS

The questions for the expectation of employers and ICT professionals exhibited an acceptable level of reliability (Cronbach alpha average = .938 and .918 respectively). First set of data was collected from employers whom 75% working in private company, 92.8% located in Bangkok, 54% related with technology as ICT end users. The second was collected from ICT professionals whom 88% working in private company, 92.7% located in Bangkok, 83.5% related with technology as ICT end users.

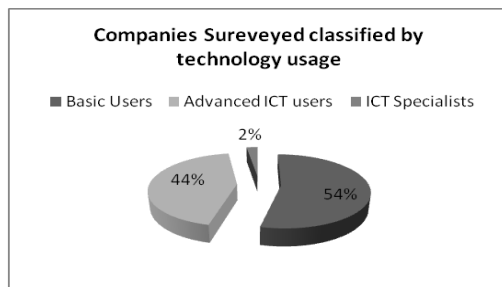


Figure 1 Demographic data of companies surveyed

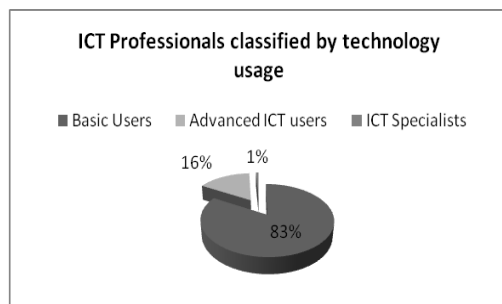


Figure 2 Demographic data of ICT Professionals surveyed

##### 4.1) Professional skills, personality and moral/ethics of ICT professionals

The first hypothesis was tested using Pearson's correlation to measure the correlation between the expectancy of ICT

employers and the verity of ICT professionals on professional skills, personality and moral/ethics. The results indicated that employers not only needed professionals graduated in relevant fields but also expected professionals to possess core generic attributes in high level.

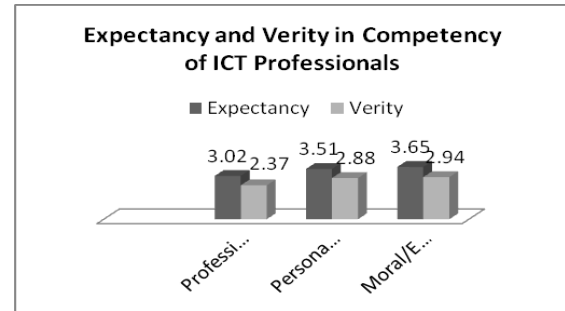


Figure 3 The expectancy and verity in competency

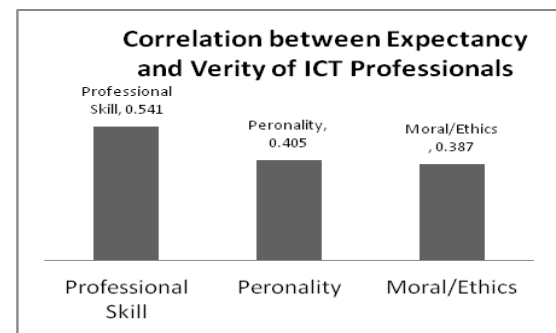


Figure 4 The correlation between Expectancy and Verity of ICT Professionals

The first rank expected by ICT supervisors was moral/ethics, following by personality and professional skills. The verity of each attribute possessed by the professionals was lower than expected. It can be interpreted that the outcome of academic process mismatched. The correlation of all attributes had positive relationship between the expectancy and verity and statistically significant at the level of 0.01. The highest correlation between the expectancy and verity was on professional skills which indicated that if professionals possess high technical skills, the satisfaction of employers will increase proportionally.

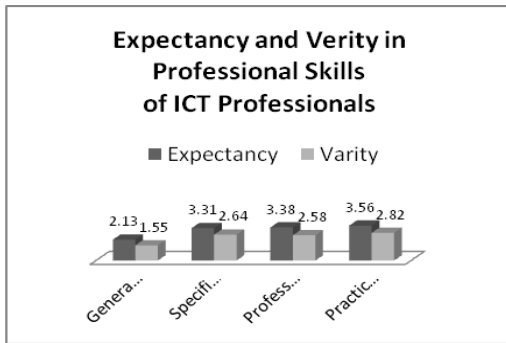


Figure 5 The expectancy and verity in professional skills

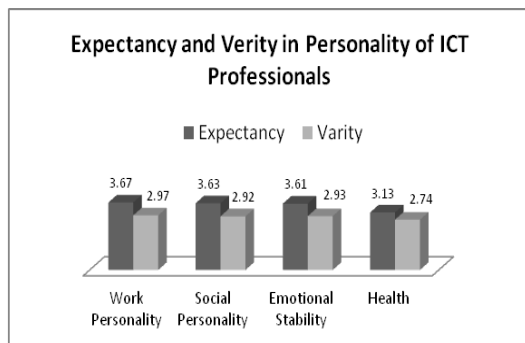


Figure 6 the expectancy and verity in personality

The respondents were requested to explore into more detail on core generic knowledge which cover hard and soft skills as summarized:

1. Professional knowledge required in high rank comprised 1) general knowledge : English, and O.S. installation 2) specific professional knowledge : program coding and networking. 3) professional talent : program installation and security. 4) practical knowledge : ability to learn and creativity.
2. Personality required in high rank comprised 1) work personality : commitment, diligence, honesty and responsibilities. 2) social personality : interpersonal skills, neatness, and appropriate behavior. 3) emotional personality : humble and gentle. health personality : active and healthy.
3. Ethics required in high rank comprised punctuality, responsibilities, consistency in

work, and discipline as well as a good team player.

The outcome of the survey induced that the consistency of ICT professionals are still lower than expect in every aspect supported by a survey result showing that over 60% of ICT graduates experienced major technical problems which need to indispensably seek help from colleagues when start working.

#### 4.2) Factors related to performance

The second hypothesis was investigated by applying Factor Analysis and Multiple Regression Analysis to analyze parameters affected the performance of ICT professionals. Parameters to find the relationship of k independent variables were classified as curriculum, pedagogue, and institute.

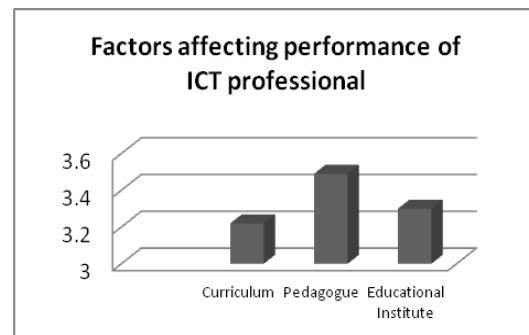


Figure 7 Factors affecting performance

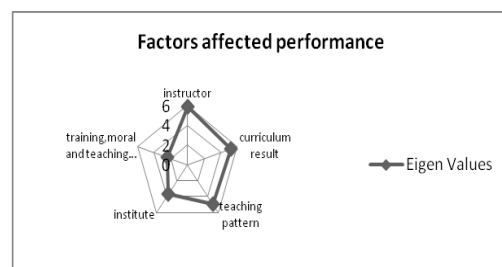


Figure 8 Factor Analysis of factors impacted IC professional competency

Factor affecting the competency of ICT professionals listed in the top rank was pedagogue, following by educational institute and curriculum. 30 variables were analyzed to verify if given variables were

appropriated to use as key elements. As a result of Principal Component Analysis five factors which can explain all the variance by 71.25% were extracted. The analysis shown that the index of Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .926 the probability (Sig.) is 0.000 which indicated that 2 variables were directly related to the performance of ICT professional. The result indicated that

1. The course contents should include moral/ethics. Modern technology like e-education is inevitably affected the performance of graduates.
2. The teaching pattern should be more focused on practical and field training. The idea of focusing on teaching theories more than hands-on experience should be changed. Graduates should be trained to work as a designer / developer instead of users.

## 5) ASSUMPTIONS

### 5.1) *Limitations*

There are limitations spontaneously occur to this approach. Most of the limitations were discovered prior to the beginning of this research and prudently aware in the data collection process. One of the limitations was questions in questionnaires were not able to cover all detail required by researcher. Thus, all doubtful issues were verified by the interview with sample groups to confirm the results. Others are the limitations on separation of level of ICT usage in companies, and partial demographic data of the company.

### 5.2) *Conclusion*

There is evidence to suggest that there is a gap between the expectation of employers and the competency of ICT professionals. It appears that the graduates are not prepared of the extent to which they can start the career in the workplace after

graduate. The interview result suggests that students do not know much about the profession they are coaching as they should. Greater collaboration between education and entrepreneurs is mandated to narrow the gap between what educators impart today and what is needed by business tomorrow. From researcher's experience and discussion with employers, they are more than willing to work closely with academics to reduce the barrier. Both parties can obtain win-win scenario since higher education can prepare ICT manpower with required skills while employers can save investment in training.

Based on the finding, education institutions need to put more efforts in building up technical skills such as : English communication skill; Operating System :UNIX, Windows; business software package; computer programming; project management; computer security; web tools; software application domain and business practice for graduates. Soft skills expected include capabilities to learn new technology, team work, commitment to work, responsibilities, loyalty and unselfishness.

The findings presented in this paper are not intended in any way to minimize the significance of technical skill. The need for which is unquestionably important. However, as indicated technical skills are a base-line measurement for hiring - necessary but insufficient alone. There are other factors involved which are valuable to the profession and required by employers. Hard skill and soft skill are required in equilibrium level. As mentioned by employers that they are willing to hire people with lower technical skill if they can prove to have loyalty to the companies. Thus, higher education should concentrate on developing necessary attributes to the outcome in order to serve the needs of the workplace.

### 5.3) Suggestion

The nature of the ICT profession is changing. A policy to attract more intelligent and articulate students who have the ability to understand how technology can solve business problems to join in the future should be considered. An effective systemic approach of knowledge sharing between academics, entrepreneurs, ICT professionals and students should be organized in e-Learning academic sphere. Empirical policy on knowledge management hub among education institutes, government, and business need to be setup if the plan to accelerate the economics growth by using technology as a weapon is a target.

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## Demand of MUIC students on the usage of e-Lecture for reviewing lessons

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### Abstract

The aim of this research is to (1) study the students' opinion on e-Lecture in order to (2) develop and design instructional multimedia (e-Lecture), (3) to revise the lessons of the courses taught in Mahidol University International College (MUIC), and (4) enhance e-Learning and m-Learning to be more suitable and match the needs of the users. The population of MUIC students is 2,824, according to information on January 6<sup>th</sup>, 2011. 300 MUIC students are selected as samples by simple random sampling. The research found that 35.67% of sample students are *interested to highly interested* in using e-Lecture to review MUIC lessons. 43.67% of sample students are found to be interested in reviewing lessons from the courses of Business Administration, followed by the lessons of Humanities and Language Division. 66.67% of sample students want to use e-Lecture at home and dormitory, followed by using it within the college. 63.33% of sample students will use e-Lecture via laptop, followed by PC computer and mobile phone respectively. More than 50% of the sample group expected e-Lecture to be designed in such a way that it would provide reviews of the lessons learnt. Also, they expected that e-Lecture must have high speed of retrieving information, comprehensive content, clear menu, easy and convenient access, good-quality lesson content, and good information connection and contain a lot of lessons for reviewing. However, less than 50% of the

sample group expected that the e-Lecture must be colorful, has a beautiful layout appearance and also has social media and games for relaxation. Moreover, they expected that after using e-Lecture, they will obtain better grades in different courses and become an up-to-date person. The subjects that students are interested to use e-Lecture to review lessons are varied and from every Division. The subjects that have a lot of frequency of students' nomination are Mathematics, Finance, English Communication and Principle of Marketing.

### Key Words:

e-Learning, e-Lecture, m-Learning

*\*Supported by Mahidol University  
International College, Seed grant*

### Introduction

#### Significance and Background of the Study

Mahidol University International College (MUIC) is the educational institution that concerns about the application of information technology in education and uses internet to complement lectures. Students and lecturers can use e-Learning and m-Learning to study and enhance the efficiency of the learning process. The instructional media such as e-Learning and m-Learning will provide quick learning lessons and well respond to the students' need for study. Therefore, using

technology for the educational benefits is necessary for the learning process because it helps students to access the contents of the lessons at anytime they need.

Researchers, therefore, need the opinions of the users' needs in using e-Lecture for reviewing lessons of MUIC. This e-Lecture is a classroom system that can be used to create and publish interactive instructional multimedia in order to support e-Learning and m-Learning. Since it can be used to review lessons at any time; provides fast, convenient and up to date curriculum contents; saves time and money; it will be an effective tool for learning that provides sufficient knowledge and skills for students to educate themselves and lead them to the society of wisdom and lifelong learning.

### **Objective of the Research**

The aim of this research is to (1) study the students' opinion on e-Lecture in order to (2) develop and design instructional multimedia (e-Lecture), (3) to revise the lessons of the courses taught in Mahidol University International College (MUIC), and (4) enhance e-Learning and m-Learning to be more suitable and match the needs of the users.

### **Research Procedure**

1. Designing the questionnaire about the needs of using e-Lecture for reviewing MUIC courses.
2. Distribute the questionnaires to the students to conduct a survey on their needs of using e-Lecture for reviewing MUIC courses.
3. Collect and evaluate data from the surveys.

### **Sample Group**

The total population of MUIC students is 2,824, according to the information on January 6<sup>th</sup>, 2011. 300 MUIC students are selected as samples for this research by simple random sampling.

Researchers found that the sample group has more female students than male students. Most of the students from sample group are 2<sup>nd</sup> year students, followed by 3<sup>rd</sup> year students, 4<sup>th</sup> year students and 1<sup>st</sup> year students respectively. In addition, most of them are studying in Business Administration Division, followed by Tourism Industry Management Division, Science Division, Social Science Division and Fine and Applied Arts Division.

### **Research Tools**

The questionnaires about the needs for using e-Lecture for reviewing MUIC lessons.

### **How to design questionnaire**

Draft questions and create questionnaire. Have the questionnaire checked by the expert and then edit and modify the questionnaire accordingly. Practically use the questionnaires and collect them to evaluate data.

### **Statistics for Data Analysis**

Use percentage and arithmetic mean to evaluate data.

### **Results**

The result of the study shows that most of the students from the sample group access e-Lecture less than one time per month, followed by 1-2 times per week and 1-2 times per month respectively. In addition, most of them used the service less than 30 minutes per month within college, at home or at dormitory and access via PC and notebook. The purpose of accessing e-Lecture was mostly to upload/download information of lessons and to submit their homework. Some sample students use it for reviewing lessons. When deliberating on which subject that the users have accessed via MUIC e-Learning, it shows that subjects

of Business Administration Division have been accessed most.

The results of the demand of using MUIC e-Lecture for reviewing lessons of MUIC students indicate that sample students are founded to be *highly* to *very highly* interested in using e-Lecture. They specify that they are interested in using e-Lecture to review lessons of Business Administration Division the most, followed by lessons of Humanities and Language Division. The sample group is founded to be using e-Lecture at home/dormitory the most, followed by within the college. Most of them access e-Lecture via notebook, PC computer and mobile phone respectively. More than 50% of the sample group expected e-Lecture to be designed in such a way that it would provide reviews of the lessons learnt. Also, they expected that e-Lecture must have high speed of retrieving information, comprehensive content, clear menu, easy and convenient access, good-quality lesson content, and good information connection and contain a lot of lessons for reviewing. However, less than 50% of the sample group expected that the e-Lecture must be colorful, has a beautiful layout appearance and also has social media and games for relaxation. Moreover, they expected that after using e-Lecture, they will obtain better grades in different courses and become an up-to-date person. The subjects that students are interested to use e-Lecture for reviewing lessons are varied and from every Division. The subjects that have a lot of frequency of students' nomination are Mathematics (20people) Finance (13people) English Communication (11people) Principle of Marketing (11 people).

## Evaluation Results for demand of MUIC students on the usage of e-Lecture

### Tables and Figures

Table 1: Number and percentage of the sample group by the level of their interest to use e-Lecture to review lessons

(n=300)

| Level of interest to use e-Lecture | Number (Students) | Percentage    |
|------------------------------------|-------------------|---------------|
| High                               | 58                | 19.33         |
| <b>Very high</b>                   | <b>107</b>        | <b>35.67</b>  |
| Moderate                           | 87                | 29.00         |
| Low                                | 17                | 5.67          |
| Very low                           | 31                | 10.33         |
| <b>Total</b>                       | <b>300</b>        | <b>100.00</b> |

From Table 1, it shows that of all 300 sample students, majority of them which is 107 people or 35.67% are very highly interested to use e-Lecture to review lessons, followed by 58 sample students or 19.33% of them are highly interested. 87 sample students or 29.00% of them are moderately interested. A number of sample students that have low and very low interested interest to use e-Lecture to review lessons are 17 and 31 students who are 5.67% and 10.33% respectively.

Table 2 : Number and percentage of the sample group by Division that they are interested to use e-Lecture for reviewing lessons

| Division that the sample students are interested to use e-Lecture | Number (Students) | Percentage   |
|---|-------------------|--------------|
| <b>Business Administration (n=300)</b>                            | <b>131</b>        | <b>43.67</b> |
| Social Science (n=300)  | 60                | 20.00        |
| Science (n=300)   | 62                | 20.67        |
| Humanities and Language (n=300)                                   | 92                | 30.67        |
| Tourism Industry Management (n=300)                               | 67                | 22.33        |
| Fine and Applied Arts (n=300)                                     | 29                | 9.67         |

From Table 2, it shows that of all 300 sample students, some are interested to use e-Lecture to review lessons from various Divisions. The majority of them which is 131 people or 43.67% are interested to use it to review subjects of Business Administration Division, followed by 92 sample students or 30.67% of them are interested to the use it to review subjects of Humanities and Language Division. 67 of sample students or 22.33% of them are interested to use it to review subjects of Tourism Industry Management Division. A number of sample students who are interested to use e-Lecture to review subjects of Science Division, Social Science Division and Fine and Applied Arts Division are 62 people, 60 people and 29 people or 20.67%, 20.00% and 9.67% respectively.

Table 3: Number and percentage of sample group by the location where they use e-Lecture to review lessons

| Location where sample students use e-Lecture                                | Number (Students) | Percentage   |
|---|-------------------|--------------|
| <b>Home/Dormitory (n=300)</b>   | <b>200</b>        | <b>66.67</b> |
| Within the College (n=300)  | 155               | 51.66        |
| Within the university (n=300)   | 12                | 4.00         |
| Internet café (n=300)   | 9                 | 3.00         |
| Other locations (i.e., everywhere, Not interested to use e-Lecture) (n=300) | 7                 | -            |

From Table 3, it shows that of all 300 sample students, some of them want to use e-Lecture to review lessons in various locations. The majority of them which is 200 sample students or 66.67% want to use it at home/dormitory, followed by 155 sample students or 51.66% of them want to use it within the college. A total number of sample students who are interested to use it within the university, in the internet café, use it everywhere and not interested to use it are 28 people or 9.33%.



Table 4: Number and percentage of sample group by type of device that sample students need it to support the usage of e-Lecture for reviewing lessons

| Type of device that sample students need it to support the usage of e-Lecture | Number (Students) | Percentage   |
|---|-------------------|--------------|
| <b>Notebook (n=300)</b>   | <b>190</b>        | <b>63.33</b> |
| PC (n=300)  | 140               | 46.67        |
| Mobile Phone (n=300)  | 86                | 28.67        |
| Tablet/iPad/iPod (n=300)  | 63                | 21.00        |
| Other devices(i.e. DVD and unspecified) (n=300)                               | 2                 | 0.67         |

From Table 4, it shows that of all 300 sample students, some of them want various types of device to support e-Lecture. The majority of them which is 190 sample students or 63.33% are those who want to use it via notebook, followed by 140 sample students or 46.67% of them want to use it via PC computer. 86 sample students or 28.67% of them want to use it via mobile phone. 63 sample students or 21.00% of them want to use it via Tablet/iPad/iPod. Lastly, 2 sample students or 0.67%, one wants to use it via DVD and another does not specify the type of device.

Table 5: Number and percentage of the sample group by the expectation on the design of e-Lecture for reviewing lessons

| The Expectation on the Design of e-Lecture               | Number (Students) | Percentage   |
|--|-------------------|--------------|
| <b>The speed of retrieving information (n=300)</b>       | <b>235</b>        | <b>78.33</b> |
| Comprehensive content (n=300)                            | 198               | 66.00        |
| Clear menu that is easy and convenient to access (n=300) | 191               | 63.77        |
| Good-quality lesson content (n=300)                      | 186               | 62.00        |
| Good information connection (n=300)                      | 164               | 54.67        |
| Contain a lot of lessons for reviewing(n=300)            | 161               | 53.67        |
| Be colorful, have beautiful format (n=300)               | 80                | 26.67        |
| Have Social Media (n=300)                                | 76                | 25.33        |
| Have games for relaxation (n=300)                        | 40                | 13.33        |

From Table 5, it shows that of all 300 sample students, some of them have the expectation on the design of e-Lecture for reviewing lessons in many aspects. Most of them which are 235 sample students or 78.33% have an expectation on the speed of retrieving information, followed by 198 sample students or 66.00% of them have the expectation on the comprehensive content. 191 sample students or 63.77% have the expectation on clear menu that is easy and convenient to access. 186 sample students or 62.00% of them have the expectation on good-quality lesson content. 164 sample students or 54.67% of them have the

expectation on the good information connection. 161 sample students or 53.67% of them have an expectation that the e-Lecture should contain a lot of lessons for reviewing. 80 sample students or 26.67% of them expect that the e-Lecture must be colorful and have beautiful format. 76 sample students or 25.33% of them expect that the e-Lecture must have Social Media. 40 sample students or 13.33% expect that the e-Lecture must have game for relax.

Table 6: Number and percentage of sample group by the expectation after using the e-Lecture for reviewing lessons

| The Expectation after Using the e-Lecture   | Number (People) | Percentage   |
|---|-----------------|--------------|
| <b>Obtain a better grade (n=300)</b>  | <b>226</b>      | <b>75.33</b> |
| Become an up-to-date person (n=300)   | 110             | 36.67        |
| Have an option to relax (n=300)   | 29              | 9.67         |
| Have more friends (n=300)   | 13              | 4.33         |
| Understand lesson more clearly (n=300)  | 13              | 4.33         |
| Other expectations(i.e. use the e-Lecture when absent the class, when finding extra knowledge, for receiving information, to increase skills) (n=300) | 10              | 3.33         |

From Table 6, it shows that of all 300 sample students, some of them have expectation on the use of e-Lecture to review lessons on many aspects. Most of them which are 226 sample students or 75.33% have the expectation that they will obtain a better grade, followed by 110 sample students or 36.67% of them expect

that they will become an up-to-date person. 29 sample students or 9.67% of them expect to use e-Lecture as an option to relax. A number of those who expect that they will have more friends and those who expect that they will understand lesson more clearly are equal at 13 sample students or 4.33%. 10 sample students or 3.33% of them have other expectations such as they will use it when absent the class, use it to find extra knowledge, use it for receiving information and use it to increase skills.

Moreover, when asking about the subjects that students are interested to use e-Lecture to review lessons, of all 300 sample students, 14 students nominate to use e-Lecture with all subjects. The following is a number of students who nominate other subjects.

Business Administration Division

BBA (9 people) Marketing, Principles of Marketing (11 people) Accounting (6people) IFM (6people) Finance (13people) Service Quality Management (4people) Micro Economics (3people) Event Management (2people) Consumer Behavior (2 people) SQM (2people) Intereconomic (1people) Micro Business (1people) Macro Business (1people) Macroeconomics (1people)

Social Science Division

Social Science Course (1people) HRM (2people) Major Social institution (1people) Psychology (2people) Physical Anthropology (1people)

Science Division

Mathematics (20people) Sciences (4people) Organic Chemistry (1people) Biology (7people) Chemistry (2people) Ecology (3people) Economic (3people) Environmental Sciences (4people) Computer Science (3people) Statistics (4 people) Pathology (1people) Political Science (1people) Management Science (1people) Programming (1people) Physical (1people) Natural Science (1people)

Humanities and Language Division

English Communication (11people)  
Japanese (4people) Moral & Ethic (4people)  
France (2people) Chinese (2people) Spanish  
(2people) Language Subject (1people) logic  
(2people) Introduction to Mass  
Communication (2people) Humanities  
(5people)

Tourism Industry Management  
Division

TIM (5 people) Ecotourism  
(1people) Strategy Management in Travel  
Industry (1people)

Fine and Applied Arts Division

Thai Art (6people) Art Theory  
(3people) Fine Art (1people) Apply Art  
(1people)  
Thai History (1people) World History  
(1people) Introduction to Culinary Art  
(1people)

The sample group also expresses the opinion that they are interested to use e-Lecture with other subjects (one person per one subject) that have a lot of lectures such as Art Appreciation, Social Anthropology Aerospace, BF, Design Technology, Direct Research, Core Course, General Education, CS Course, Manager, New Product, Yoga and Swimming Physical Activities

**Discussion**

The plan to design e-Lecture for students to review lessons by applying research results to redesign e-Lecture to cohere with the students' behavior is detailed as follow:

1. In order to modify and develop network system and instructional media for the future benefits of students and expand it to cover more users, we would interact with students and invent methods that can motivate or persuade them to access network system and use MUIC e-Learning more frequently. However, the research results indicate that a lot of present students use e-Learning less than one time per month. Plus,

some students are not interested in using e-Learning. The research results also show that students will access and use network system when they need to download information in the lessons and submit homework rather than using it to review lessons.

2. MUIC e-Learning would need to be designed to support the use via PC computer and notebook, and then designed it to support the use via mobile phone or other wireless communication devices. This is because the research data shows that students who use e-Learning via PC computer and notebook are more than those who use it via other devices. Some of students express that they also need to use e-Learning via mobile phone or other wireless communication devices, too.

3. For the use via network system, it would need to be given priority on the network outside college and make it to be more convenient because the research results indicate that though students mainly use e-Learning within the college, a number of students who need to use e-Learning at home or dormitory are more than those who need to use it within college.

4. The important issues on system development and design that would need to be concerned are the speed of the system, comprehensive lesson content and menu that is designed for easy use. These are the issues that students concern more than beautiful format, social media and game. This maybe because the students give priority to the expectation on obtaining a better grade.

5. The subjects that would need to be included in the pilot project of development and design e-Lecture for reviewing lessons and also be used are: Mathematics (20people) Finance (13people) English Communication (11people) Principle of Marketing (11 people). It should be operated in the characteristics of research and development with the cooperation from the lecturers in those subjects. Ask them to

be academic consultants to provide information and check the quality of basic information necessary for the design process such as behavioral objectives, selection and compilation of contents or issues in the subject, activities and measurement and evaluation in e-Lecture, etc. After developing and designing e-Lecture for one subject, the project operation in the characteristics of research and development will help e-Lecture designing team discovering a clear and formalized process and procedures on how to develop and design e-Lecture for reviewing lessons. This will later lead to more effective subject design and development.

6. To apply research results, the researchers would like to present the sample of MUIC's future project and use it as a guideline to develop the usage of e-Lecture of MUIC students comparing it with the Mahidol University Library and Knowledge Center's project development of E-Lecture on Web which coheres with Mahidol University's Strategic Plan: Teaching and Learning Excellence and Administrative Strategy: ICT-Based University & Resource Optimization.

## Conclusion

From the results of the research, it is founded that Mahidol University International College has the need to develop e-Lecture's characteristics to be able to access via internet to be used at home; able to be accessed via computer notebooks or PC; and also through mobile phones or other wireless communicating devices like iOS and Android which has quick browsing speed, covered contents, varying menus which are clear and easy to use. Also, e-Lecture needs to have good quality of contents of different lessons from different courses. To match with the needs of the students, e-Lecture would need to help the students to gain better grades and

help them to keep updated with the progress of information technology and communication. Also, e-Lecture would need to be able to satisfy the needs of the students and provide proper help to the increasing number of the students. Importantly, it also will need to be related with the university's strategy of using information technology and communication as the basis of developing the education system to build a learning organization and academic excellence.

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# **Students' Perceptions towards Learning Experiences, Curriculum and Satisfaction of an e-Learning Program: A Case Study of an International e-Learning Program offered in Thai Institution**

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## **ABSTRACT**

Teaching and learning processes as well as the students' satisfaction towards the academic program are some indicators for measuring quality of academic programs. For academic institution to improve and perform better, it is critical to constantly aware of the students' perceptions toward different aspects of the academic programs. For academic program that offered as full-e-Learning mode, the perceptions of students are even more critical since the mode of study may not be preferable by all students. The e-Learning programs might have similarities and differences that may cause students to become uncomfortable and dissatisfied toward the learning experience. In Thailand, there are policy and plan to promote using of ICT and e-Learning for academic programs. However, there may be a lack of information regarding the perception toward aspects of academic institution of students who already experience an e-Learning program offered by Thai institution since there are few institutions that offered a full online learning program.

The current paper gathers such data using a 38-item questionnaire that includes the perception toward learning experience in e-Learning, the perception toward the curriculum offered, and the satisfaction toward aspects of e-Learning. The source of the information is obtained from a Thai academic institution that offered a full e-Learning

program at the graduate level. The report would provide insight into students' perception and certain strengths and weaknesses of the e-Learning program offered in Thailand. The data collection process was completed by 69 respondents both current students and alumni participated in the study (n=69). The results revealed that respondents have good attitude towards their learning with the mean value of 3.89 (M=3.89). Regarding the quality of curriculum, the respondents satisfy with the provided curriculum (M=4.00). In terms of satisfaction, the respondents reported that they satisfied with the mean value of 4.01 (M=4.01). According to the mean values of all variables, it can be concluded that respondents, satisfy and have good attitude towards their e-Learning program.

## **Keywords**

Attitude towards e-Learning, e-Learning, e-Learning curriculum, Perception, Students' Satisfaction

## **1) INTRODUCTION**

The Internet usage nowadays has been rapidly grew. Most institutions have adapted themselves from the purely traditional teaching style to the hybrid mode of teaching, which implement information communication technology into some of learning and teaching processes. For institutions with fully equip of equipment, and budget moving them to

the self-contained online instruction. College of Internet Distance Education, Assumption University is one of them.

The College of Internet Distance Education has been established since 2002 to provide worldwide education to anyone, from anywhere and at anytime. According to <http://digitallearning.eletsonline.com/> website, Assumption University with its establishment of the College of Internet Distance Education on April 25, 2002 spearheaded the visionary initiative for Thailand to be the seat for eLearning in Asia by offering complete eLearning degree programs. The government of Thailand later then, legalized eLearning degree programs in 2005. The university recognized the importance of widening opportunities for anyone wanting to continue their education conveniently at their own time and paces, as well as promoting lifelong learning using the Internet, the shift from traditional classroom-based to Internet-based distance education

([www.digitallearning.in/april06/assumption\\_university.asp](http://www.digitallearning.in/april06/assumption_university.asp), 2012).

## 2) OVERVIEW OF e-LEARNING

Education is considered as one way to develop the human resources of the country, thus increasing its economy and competitiveness. There are several ways to deliver the knowledge or to educate people. In the past, learning and teaching always take place in a classroom setting as we called “a traditional learning environment.” However, as the technology and innovations are growing and moving forwarded, the usage of such technology is adopted and adapted to be an option to provide people with effective learning and teaching methods, e-Learning is not an exception.

Chorpothong, and Charmonman (2004) listed some benefits of e-Learning, which include: 1) degree awarded from online courses is equivalent to the traditional on-

campus degree; 2) flexible choice of degree from fully accredited universities; 3) the study can be from any place and at any time through a combination of online media, including e-mail, Internet conferencing, and other facilities of the Internet; 4) time and cost savings from travelling; 5) studying while working full-time; and 6) earning degree from universities abroad while staying with the family in home country.

e-Learning gives learners an opportunity to broaden their knowledge because they can learn on their own and that increases learners’ level of confidence and independence (Eke, 2011). “Good teaching is good teaching, no matter how it is done” (WorldWideLearn.com, 2011). Therefore, lots of benefits from e-Learning will enhance the rich content and knowledge. Students can use Internet based technology to access, share and encode knowledge to enhance learning with a great deal of information available online to read, analyze and store into their memory. Besides, technology can promote collaborative work while they can communicate through email, mobile devices or social media networks. In addition, e-Learning provides cost effective for learning with variety of media such as video, audio, interactive simulations, wikis, blogs and forums. These teaching methods promote challenge to learning as well as students will be more involved in technology enhance learning to make them to become an active and motivated learner. Technology enhances learning allows students to control their own learning progress, and to repeat and review the course content for more understanding at their convenience time.

## 3) RESEARCH QUESTIONS

1. What are the levels of perception towards CIDE students and alumni regarding attitude towards e-Learning at CIDE?

2. What are the levels of perceptions towards CIDE students and alumni regarding quality of curriculum provided at CIDE?

3. What are the levels of perceptions towards CIDE students and alumni regarding their satisfaction towards CIDE?

#### **4) RESEARCH OBJECTIVES**

1. To determine the level of perceptions towards CIDE students and alumni regarding attitude towards e-Learning at CIDE

2. To determine the level of perceptions towards CIDE students and alumni regarding quality of curriculum provided at CIDE

3. To determine the level of perceptions towards CIDE students and alumni regarding their satisfaction towards CIDE

#### **5) SIGNIFICANCE OF THE STUDY**

The study will benefit the CIDE to improve its curriculum to ensure the appropriateness to serve the needs of prospective students. In addition, the findings would benefit the CIDE to improve its e-Learning teaching and learning processes to ensure that the effective learning and teaching has occurred. In addition, the result may be served as a guideline in creating and designing an effective e-Learning for other institutions as well.

#### **6) LIMITATIONS OF THE STUDY**

The study was only conducted based on students and alumni perceptions towards e-Learning system provided by CIDE. Therefore, the results may not be applicable to other institutions that provide e-Learning programs since the system and learning and teaching process may be different. In addition, the results may not be directly benefited other types of teaching and learning such as traditional classroom teaching or hybrid learning.

#### **7) VARIABLES MEASURING e-LEARNING QUALITY OF CIDE**

To measure the quality of e-Learning, there are variety of researchers or organizations have focused on different aspects of quality. For example, the European Association of Distance Teaching Universities (EADTU), the Europe's leading association for Lifelong Open and Flexible (LOF) learning in distance Higher Education (HE) has set up benchmarks and indicators to measure e-Learning quality, which include design of curriculum, course design, course delivery, staff support, and student support (Ubachs, 2009). In addition, Martínez-Arguñelles, Castán, and Juan (2010) stated that learning process, administrative processes, teaching materials and resources could be aspects to measure effectiveness of e-Learning.

However, for the current research, the variables to measure students' perception towards e-Learning including attitudes towards e-Learning, quality of curriculum, and overall satisfaction as explains as followed.

##### *Attitude towards e-Learning at CIDE:*

By its definition, attitude refers to an individual's favorable or unfavorable evaluation of an object, aspect, or else (Fishbein and Ajzen, 1975). Thus, the attitudes regarding the e-Learning can be referred to as a student's perceptions toward their judgment on e-Learning that they have had experiences at the institution. The attitudes was measured with the 14 items, which related to the ability to apply knowledge for career, career advancement, communication skills, computer skills, problem solving skills as well as interpersonal skills that students would develop or experience during their study in the e-Learning program.

##### *Quality of Provided Curriculum:*

To measure students' satisfaction on an e-Learning environment, curriculum was

mentioned to be one of the important factors to explore since it was considered as one of the major responsibilities towards satisfaction (Ubachs, 2009). The curriculum refers to materials that students will interact and follow in order to achieve the identified educational outcomes or outputs (Ebert II, Ebert, and Bentley, 2011). In addition, according to Education & Reference Questions and Answers Web (EduQnA) (2012) website, the curriculum is something “that supports a complex network of physical, social and intellectual conditions that shape and reinforce the behavior of individuals, and takes in consideration the individual's perceptions and interpretations of the environment in order to reinforce the learning objectives and to facilitate the evaluation procedures.” For the purpose of the current research, the aspects regarding quality of curriculum provided insists of the acceptance by others domestically and internationally after graduation, demand of the market, and promoting certain skills aligned with the institution identity.

*Satisfaction towards CIDE:*

Student satisfaction is considered as one of major successes for measuring education. Satisfaction refers to as a feeling of a person who has experience or an outcome that fulfill his/her expectation (Kotler and Clarke, 1987). In addition, Carey, Cambiano, and De Vore (2002) stated that satisfaction covers issues of students' perception and experiences during their study time at the institution. The student satisfaction in the current research explored students' past experiences regarding the quality of the instruction, the interaction among students to students/students to instructors/students to staff as well as the overall of courseware provided in the program.

## 8) METHODOLOGY

This was a descriptive research which described the respondents' levels of perceptions towards learning attitude, quality of curriculum, and satisfaction towards CIDE. The population and sample of this research is students and alumni of CIDE. The convenience sampling technique was applied to select respondents of the research. The self-administered questionnaire with 5 levels Likert scale was selected as a research instrument. Data collection was taken place at the CIDE faculty and student engagement activity and online. All data was kept confidential and anonymous. There were 69 respondents ( $n = 69$ ) participated in the study. Out of 69 respondents, there were 34 current students, and the other 35 were alumni who participated in the study. The Cronbach's alpha values of the questionnaire were presented in table 1.

Table 1: Cronbach's alpha values of variables

| Variables                 | Cronbach's Alpha |
|---------------------------|------------------|
| Learning attitude at CIDE | 0.83             |
| Quality of curriculum     | 0.89             |
| Satisfaction towards CIDE | 0.92             |

According to Nunally (1978), if the Cronbach's alpha value of the questionnaires is equivalent to or higher than 0.7, it means that the questionnaire is reliable. As reported in table 1, all variables studied in the research had Cronbach's alpha value higher than 0.7, which confirmed that the questionnaire was reliable.



## 9) RESULTS AND DISCUSSION

### *Demographic Information:*

The majority of the respondents work as private company employees with monthly income of approximately 30,001-40,000 Baht.

Since this was a descriptive research, the mean values can be analyzed by applying the arbitrary level to determine respondents' perceptions, according to Yamane (1999) as shown in table 2.

Table 2: Arbitrary Level

| Scale Interpretation | Level of Agreement |
|----------------------|--------------------|
| 4.21-5.00            | Strongly Agree     |
| 3.41-4.20            | Agree              |
| 2.61-3.40            | Neutral            |
| 1.81-2.60            | Disagree           |
| 1.00-1.80            | Strongly Disagree  |

Source: Yamane, T. (1999). *Statistics: An introductory analysis* (3<sup>rd</sup> ed.). New York: Harper & Row.

### *Descriptive Statistics:*

The respondents reported that they have good attitude towards their learning at CIDE with the mean value of 3.89 (M=3.89). Regarding the quality of curriculum of CIDE, it is rated at the satisfaction level, which means that the respondents satisfy with the provided curriculum (M=4.00). In terms of satisfaction towards CIDE, the respondents reported that they satisfied with the CIDE with the man value of 4.01 (M=4.01). According to the mean values of all variables, it can be concluded that respondents, which were current students and alumnus satisfy and have good attitude towards CIDE.

However, when consider the mean value of each statement; it is apparent that the lowest mean value of the attitude towards learning variable was the item that asked "Improved my ability to work

cooperatively in groups" (M=3.85). Some respondents may feel that group work was not promoted in their learning experience at CIDE. Since one of the advantages of e-Learning environment is the self-paced learning, students do not need to study at the same time or at the same pace as their classmates. It may be possible that instructors realize and promote this advantage to students by not assigning a group work project to students. As a result, students felt that they do not have experience to work in groups. Therefore, in order to enhance and develop cooperative working skill to students, instructors should aware that in the real world situation, students need to work with others. Thus, assigning some group project activities would allow students to get acquainted to such interaction.

In terms of quality of CIDE curriculum, the overall mean value was rated at the agree level, which means that the curriculum provided at CIDE is of good quality. However, when consider each statement of this variable, the lowest mean value statement is "Outstanding quality when compare with other academic institution" (M=3.83). This item was rated at the lowest mean value even though it is still in the agree level. The curriculum provided through CIDE may not be well-known as from other institutions since the college just recently established for about 8 years. Thus, the name of the programs and the college themselves may not be recognizable by others just yet. Therefore, the CIDE should take this item to consideration for future improvement of the program and its curriculum to be well-known and comparable to others in the market.

For the satisfaction toward CIDE, all items in this variables were rated at the strongly agree and agree level, which means that respondents felt satisfied with what CIDE provided to them. However, the item that was rated with the lowest mean score is

“The interactions with other students” (M=3.72), which still rated at the agree level. The result of this item was consistent with the lowest mean value of the attitude towards learning variable, item “Improved my ability to work cooperatively in groups”. With the perceptions of respondents on the cooperatively work in groups and the interactions with other students, which showed the lowest mean values, it is apparent that what CIDE provides interaction activity may not be enough for students. Even though students chose to study via e-Learning mode with their own self-pace, the interaction among them is still needed for them. e-Learning is not just a one-way communication which allows students to interact with the content or the instructor. Therefore, in order to help increasing the mean value of this item, the college may promote activities that require interaction among students both asynchronous and synchronous.

## 10) CONCLUSION

In conclusion, with the data regarding the perceptions towards attitude towards learning, quality of curriculum and satisfaction towards CIDE, the results revealed that students satisfy and have good attitude towards their e-Learning programs. However, the CIDE should maintain the quality and try to improve other aspects in order to become a leading e-Learning institute for Thai education.

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## **21<sup>st</sup> Century Skills of Undergraduate Students in Science and Technology: An Information Literacy Assessment**

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### **ABSTRACT**

The role of information literacy (IL) skills - one of the most necessary skills in 21<sup>st</sup> century - is recognized by the global communities as well as by Thailand as the driving tool of successfulness in the digital age. However, the study of IL in Thai context, especially in Science and Technology, is still limited.

**Objective:** This study aims to assess the understanding in information research process of the university students in Science and Technology disciplines in order to identify their skills level and the issues needed for skills improvement.

**Method:** Based on a survey undertaken by The Working Group on Library Instruction of the Subcommittee on Libraries of the Conference on Rectors and Principles of Quebec Universities (CREPUQ), an IL questionnaire was accommodated to 550 freshmen at King Mongkut's University of Technology Thonburi. The data from 442 completed questionnaires were analyzed by the basic statistics to show the response rate of the answers.

**Results:** The average of students' range score from the questions of information research process was between 5 to 8 points from the total score: 20 points. There were only three questions consisting of specific understanding in formulating synonym to identify a concept, using keywords, and knowing when to use a search engine, that over half of the respondents could select the best answers (56.1%, 69.5%, and 55.2%, respectively). The difference between the results from the students' self-

assessment and their IL skills level is emerging. Insufficiency understanding of all areas in information research process demonstrates the students were rather low information literate.

**Conclusions:** The findings regarding to the learners' characteristics, level of IL competency, and comments are highlighted to the institutions to set a mandatory program of IL skills evaluation for new entry students including IL skills development courses for particular students.

### **Keywords**

Assessment, Information literacy skills, Science and Technology, Undergraduate students

### **1) INTRODUCTION**

In 21<sup>st</sup> century learning environment, students' achievement of information literacy (IL) becomes an essential part of their success as learners. Information literacy skills or "A set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association, 1989), play an important role in academic accomplishment and lifelong learning.

Due to the importance of IL skills, THAI government has considered information competencies to Thai population at all levels and in all disciplines as stated in National Education Act of B.E. 2542 (1999) (Office of the National Education Commission, 1999). Furthermore, the term

“information literacy” has come into policy arena in 2009 in the Second ICT Master plan (2009-2013) with the vision on people at all levels of society should be smart and information literate with the knowledge and capacity to access, create, and use information in an information-literate way in order to benefit education, work, and everyday life (Pooparadai, 2010). Although IL has been included in the national policies, there are likely limited research and study on IL skills development in Thai context especially in Science and Technology disciplines which a wide variety of information sources and formats are needed for rapidly changing fields.

Science and Technology education is an important instrument in the search for sustainable development and poverty reduction. Meanwhile, educational systems are faced with the challenge of this field education that has lost relevance and not being able to adapt to current scientific and technological developments (UNESCO, 2011). As the practicing scientist and engineer need to keep up with new developments and new sources of experimental or research data, IL skills are highly important to be focused on them (Association of College & Research Libraries, 2006).

Several previous studies in IL reveal that an initiative of information competencies development was highly needed for the freshmen. However, most of the academic institutes usually presumed that their students already had a good information performance and gained IL skills automatically by themselves as they could normally operate the computer and surf the internet (Freeman & Balta, 2010; Pobert, 2009; Shanahan, 2007). Consequently, the IL skills assessment and development were rarely set as a mandatory program for the students

To evaluate IL performance, the most widely used assessments have been

conducted under the standards of the Association of College and Research Libraries (ACRL). For example in Canada (Mittermeyer & Quirion, 2003), the Working Group on Library Instruction of the Subcommittee on Libraries of the Conference on Rectors and Principles of Quebec Universities (CREPUQ) has developed a questionnaire based on ACRL standards to compile data on the information research skills of undergraduate students entering Quebec Universities in 2003. The study of CREPUQ has identified the information research skills into five areas: 1-Concept Identification, 2-Search Strategy, 3-Documents Types, 4-Search Tools, 5-Use of Results, and the skills in each area became twenty variables as represented in 20 multiple-choice questions. In addition, this questionnaire has been adapted to assess the skill levels of students at other academic institutes e.g. Monash University, University of Leeds, The University of Auckland (Monash University, 2005; Harrison & Newton, 2005; Brookes & Hu, 2008; Ali et al., 2010).

With the quickly changing Science and Technology landscape requiring increasingly sophisticated information literacy skills person, evaluation of the students' IL skills will determine the important issues for academic institutes to provide more appropriate and solid approaches to strengthen their students' skills.

## 2) OBJECTIVES

- To investigate the IL skills level of undergraduate students in Science and Technology
- To identify the needed IL skills improvement of undergraduate students in Science and Technology

### 3) METHODOLOGY

#### 3.1) Participants

The participants for this study were undergraduate students in Science and Technology. The sample was drawn from first year students of King Mongkut's University of Technology Thonburi who enrolled in GEN121-Learning and Problem Solving Skills (regular course) in the second semester of academic year 2011.

#### 3.2) Materials

The IL questionnaire was based on a survey undertaken by CREPUQ consisting of three parts: I) General information of participant II) 20 multiple-choice questions based on skills areas (Table 2) III) Open-ended recommendation. The test items were modified to make them specifically relevant to Science and Technology students including content validity evaluated by five specialists in IL, and Science and Technology Education. The IL questionnaire was distributed to 550 freshmen in the class and 442 complements were returned.

### 4) RESULTS AND DISCUSSION

The results from the IL questionnaire were analyzed by the basic statistics to show the response rate of answers for each question about the participants (Part I), and the percentage of respondents who selected the best answer(s) for each question in five areas of information research skills (Part II). Furthermore, the students' comments at the end of the questionnaire were also discussed (Part III).

#### 4.1) Part I: General Information of Participant

Table 1 shows the percentage of participant's gender and their IL training experiences. 55.9% of participants were males while 44.1% of them were females. Less than half of them had an experience in library skills training in higher education as well as in academic writing and research

skills training (30.5% and 38.0% respectively).

Table 1: Information of participants

| <i>Participants' information</i>              | <i>F</i> | <i>%</i> |
|---|----------|----------|
| <b>Gender</b>                                 | Male     | 247 55.9 |
|   | Female   | 195 44.1 |
| <b>Having experiences in</b>                  |          |          |
| Library skills training in higher education   | Yes      | 135 30.5 |
|   | No       | 307 69.5 |
| Academic writing and research skills training | Yes      | 168 38.0 |
|   | No       | 274 62.0 |

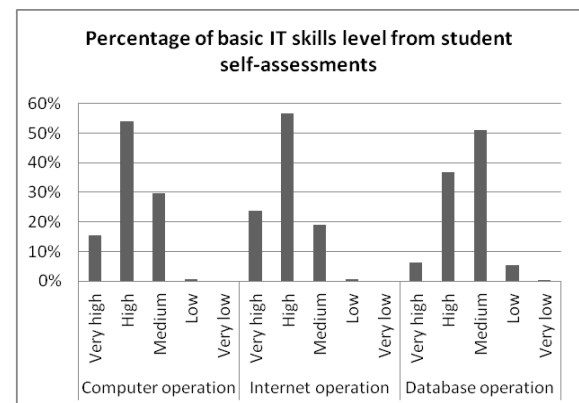


Figure 1: Results from student self-assessments

Furthermore, student self-assessments demonstrate that both skills of computer and internet operation were at high level (54.1% and 56.6% respectively) whereas the skill of database operation were at medium level (51.1%).

The results of their self-assessments (Figure 1) were compared with the results of IL test as the description is given in the following section.

#### 4.2) Part II: Information Research Skills

Based on the survey of CREPUQ, the questionnaire was used to gather data with specific knowledge of the skills considered essential to the success of an information search in Science and Technology as stated in Table 2.

#### 4.2.1 Area 1: Concept Identification

Significant words were used as variables for all questions in Area 1 to examine how the respondents determine the concepts to be used when defining a search strategy.

Table 2: Summary of results by areas of information research process

| <i>Information research process</i>     | <i>Specific knowledge of the question</i>                                   | <i>No.</i> | <i>% of correct answers</i> |
|---|---|------------|-----------------------------|
| <b>Area 1</b><br>Concept identification | Using appropriate terms to identify the main concepts                       | 4          | 47.7                        |
|   | Distinguishing between significant and non-significant words                | 8          | 31.4                        |
|   | Formulating synonym to identify a concept                                   | 13         | <b>56.1*</b>                |
| <b>Area 2</b><br>Search strategy        | Using keywords  | 2          | <b>69.5*</b>                |
|   | Using Boolean operator "OR"   | 9          | 39.4                        |
|   | Using appropriate search indexes  | 11         | 29.6                        |
|   | Using a thesaurus to get the preferred vocabulary for a particular database | 12         | 30.3                        |
|   | Using Boolean operator "AND"  | 16         | 45.5                        |
| <b>Area 3</b><br>Documents types        | Knowing when to cite an encyclopedia  | 3          | 18.8                        |
|   | Knowing when to cite a scholarly journal                                    | 15         | 49.5                        |
|   | Knowing the criteria of a scholarly journal                                 | 20         | 11.3                        |
| <b>Area 4</b><br>Search tools           | Knowing when to use a database  | 1          | 9.7                         |
|   | Knowing when to use a search engine   | 6          | <b>55.2*</b>                |
|   | Knowing how to find information in a library catalogue                      | 7          | 13.1                        |
|   | Knowing the characteristics of meta-search engines                          | 14         | 5.2                         |
|   | Knowing what information can be found in a library catalogue                | 17         | 12.7                        |
| <b>Area 5</b><br>Use of results         | Recognizing the type of document in a bibliographic reference               | 5          | 11.8                        |
|   | Knowing what a bibliography is  | 10         | 40.3                        |
|   | Knowing the criteria used in evaluating the quality of a website            | 18         | 9.7                         |
|   | Knowing when to include a reference to avoid plagiarism                     | 19         | 14.7                        |

Note: \*A rate of above 50% of participant who selected the correct answers

For Question 4, 47.7% of the respondents could identify the main concepts with appropriate keywords in the topic "Using alternative energy in automobile manufacturing plants in Asia" while others selected the answers with non-significant words. To distinguish between these keywords in the topic "The effects of climate change due to global warming in Thailand" in Question 8, about a third of respondents (31.4%) answered correctly while 51.1% of them selected the answers by including restrictive terms such as "effects" which reduces the number of search results obtained. For Question 13, over half of the respondents (56.1%)

seemed to be able to recognize words with similar meaning in the topic "Measures currently used across the country to decrease the damage to natural environment". The best answer of this question consisted of significant words including the word "protective measures" which were used as synonym of the word "measures to decrease damage", and the word "Thailand" which implied from the original term "country".

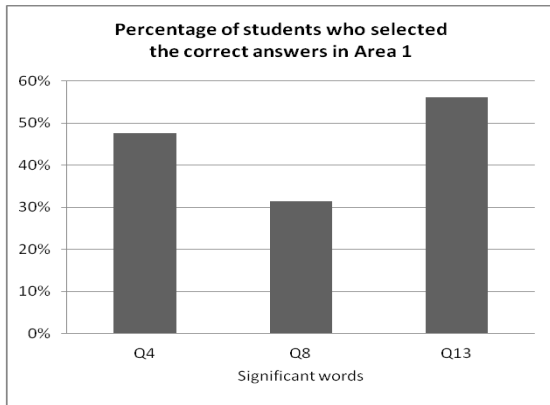


Figure 2: Result of Concept Identification

Figure 2 shows the results from three questions in Area 1. Even over half of the students could answer correctly in Question 13, the synopsis of their comprehension in concept identification was still inadequately.

#### 4.2.2 Area 2: Search Strategy

Search strategy was focused in Area 2, comprising five variables: translation into keywords, Boolean operator "OR", search indexes, controlled vocabulary, and Boolean operator "AND". For Question 2, 69.5% of respondents appeared to recognize the problem of using term "small-sized technology", which did not correspond with "nanotechnology" employed and preferred by the OPAC system. To get more search results by using Boolean operator in Question 9, over a third of the respondents (39.4%) selected "OR" operator which is the best suite for the synonym of "car" like "vehicle" and "automobile". For Question 11, the students were asked how they would do the search to find all the documents about "Albert Einstein" in the library catalog. The results of this question show that less than a third of the respondents (29.6%) could use the search indexes correctly while most of them (60.1%) failed to differentiate between an author, a title, and the subject of search. Mastery in the concept of controlled vocabulary is a part to develop an effective search strategy. However, there were almost 70% of the respondents failed to select a thesaurus as a

tool in searching for preferred terms for a specialized database in Question 12. The search strategy with Boolean operator "AND" were used to find the documents containing all specified search terms in Question 16. The results indicate that less than half of the respondents (45.5%) were familiar with the "AND" operator.

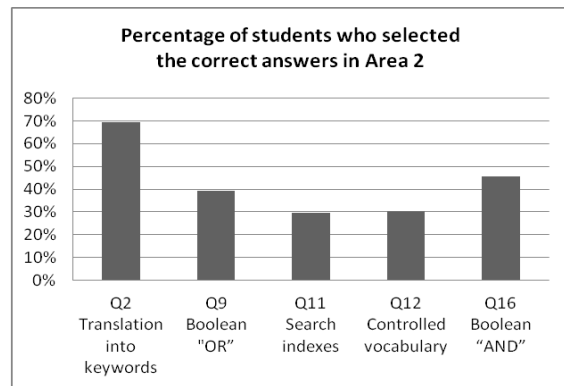


Figure 3: Result of Search Strategy

Figure 3 shows the results from five questions in Area 2. Most respondents seemed to have a great awareness in use of keywords. On the contrary, over half of them lacked the strategy to perform searching efficiently by using the inappropriate Boolean operators, missing the point of search index in an OPAC system, and unawareness of controlled vocabulary tools like a thesaurus.

#### 4.2.3 Area 3: Document Types

Encyclopedias, scholarly journals, and criteria of scholarly journals were used as variables for three questions in Area 3. The results from Question 3 demonstrate that only 18.8% of the respondents know when they should consult an encyclopedia. To verify whether the students understand the characteristics of various types of documents, the respondents were asked which document types they could find the most recent and reliable information about "solar cell" in Questions 15. Almost half of the respondents (49.5%) knew the scholarly journals containing more up-to-date and more authentic information than other types of documents. Multiple answers were allowed in Question 20 in



order to be selected for the best describe(s) of a scholarly journal. The results represent that only 11.3% of respondents could select all the correct characteristics of the scholarly journal.

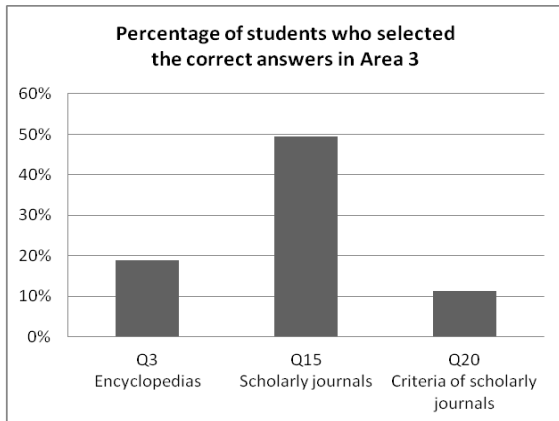


Figure 4: Result of Document Types

Figure 4 shows the results from three questions in Area 3. Most of the respondents lacked the knowledge in identifying the criteria of different document types. Especially the scholarly journal, least of the respondents comprehended this essential source of information containing theoretical discussions or research results for a specialized public. The students in Science and Technology are emphasized to study scientific information from the scholarly journals influencing the new developments or experiments.

#### 4.2.4 Area 4: Search Tools

Databases, search engines, library catalogues, and meta-search engines were variables used for five questions in Area 4, to evaluate the selection of a search strategy according to the search tools available. For Question 1, only 9.7% of the respondents knew that a database is the most efficient search tool for finding journal articles about “*innovation in energy-efficient buildings*” while 74% of them chose Google, which can provide links to some journals but requires more complex procedures to get the articles. Question 6 was developed to verify understanding of the students in search

engines like Google. Over half of the respondents (55.2%) recognized that search engines are not appropriate tools for finding documents held by the library. Both Question 7 and 17 were used to exam the knowledge of library catalogue, the search tool enabling library users to find documents available at the university. To access a journal article via the OPAC system, there were only 14% of the respondents selected the search indexed by author which is the most appropriate answer in shortening the search procedures for Question 7. Multiple answers were allowed in Question 17 in order to be selected as the items could be found in the library catalogue. The results represent that only 12.7% of respondents could identify all the correct items. For Question 14, a large number of the students were unlikely familiar with the meta-search engine as 56.8% of respondents answered that they did not know the appropriate answers for this questions.

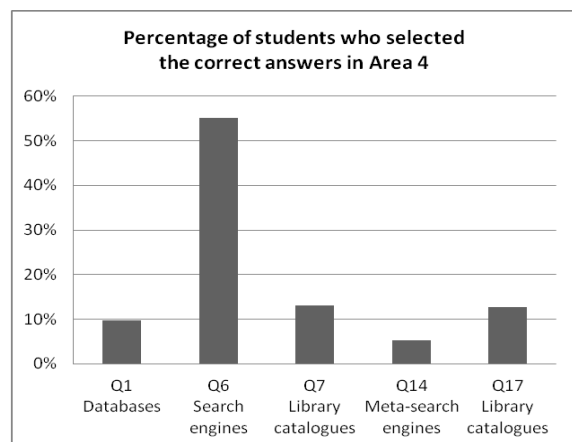


Figure 5: Result of Search Tools

Figure 5 shows the results from five questions in Area 4. Even most students seemed familiar with Google, they were aware neither the types nor the limitations of the search engines. Furthermore, the results demonstrate that students seriously lacked comprehension in the databases contrasting with the medium level from the self-assessment in their skills of database operation displayed in Figure 1. The students also had insufficient skills for the

library catalogue use. Only a few of them knew clearly how to use search index and the kind of information can be found in the library catalogue.

#### 4.2.5 Area 5: Use of Results

Reading citations, bibliographies, evaluation of information, and ethical use of information were used as variables for four questions in Area 5. The results from Question 5 represents that majority of the respondents (88.2%) were neither able to interpret a bibliographic reference nor recognize the corresponding document type. For Question 10, over one-third of the respondents (40.3%) knew that they could use bibliographies to find relevant documents. Although the internet is increasingly used as the information source, only 9.7% of respondents knew the criteria to evaluate the quality of an internet site in Question 18. Only a few respondents (14.7%) knew when to include a reference to an article they cite in Question 19.

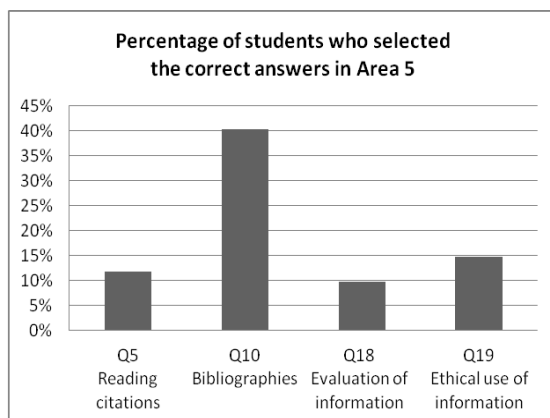


Figure 6: Result of Use of Results

Figure 6 shows the results from four questions in Area 5. Almost 90% of the respondents demonstrated that they lacked comprehension in the internet sources evaluation contrasting with the high level from the self-assessment in their skills of internet operation displayed in Figure 1. To commit plagiarism without realizing may be a big problem of the students. They need to gain the knowledge of citation as an ethical requirement and the ability to identify and locate the works.

The summary results indicate the percentage of respondents who scored from each question in five areas with the total score: 20 points. The average of students' range score was between 5 to 8 points. For that matter, there were only three questions consisting of specific understanding in formulating synonym to identify a concept, using keywords, and knowing when to use a search engine, that over half of the respondents could select the best answers (56.1%, 69.5%, and 55.2%, respectively). In contrast with the results from the students' self assessment, this insufficiency understanding of all areas in information research process demonstrates the students were rather low information literate.

#### 4.3) Part III: Open-ended Comments

The following comments from the respondents reveal that some students recognized the complication of the information research process. They needed mandatory courses or regular programs to influence their abilities in information research while some of them thought the IL skills are not necessary. Additionally, the students were rather familiar with internet search engines like Google than databases because of the accessibility, even the search engines are not always appropriate for all kinds of information.

*-“It would be great if our university set ‘How to operate each available database in library’ as a mandatory program”*

*-“Any particular courses of these skills in our university?”*

*-“Google is the most easily used search tool, it’s quite boring to find information from such complex databases”*

*-“Google only!”*

*-“The questions in this assessment are quite hard for me as I have no knowledge in these skills”*

*-“I think I am not concerned with these skills”*

*-“Because of limited knowledge in information literacy, most of people cannot use information effectively”*

## **5) CONCLUSIONS**

The summary results regarding to the students' characteristic, IL skills level and perspectives, reveal their limited information comprehensions. The low information literate students represented by the weak results from five areas of information research process is indicative of a serious problem that requires the academic institutes' attention to strengthen their students' information competency with the initiative approaches especially a mandatory program of IL skills evaluation for new entry students and IL skills development courses for particular students in Science and Technology.

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## **Attention Deficit Hyperactivity Disorder (ADHD) Student Classification Using Genetic Algorithm and Artificial Neural Network**

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### **ABSTRACT**

Attention deficit hyperactivity disorder (ADHD) is a group of neurobehavioral disorders that have a neurobiological basis with strong genetic components. It impacts multiple areas of brain functions and life activities. Even though clinical interviews and multiple informants both contribute to a reliable assessment of ADHD in referred samples, this diagnostic methodology is difficult in epidemiological community-based studies, in which prevalently more rapid parent and/or teacher questionnaire referenced rating scales are used as proxies for diagnosis. Owing to the complex nonlinear relationship among the main morphological features of ADHD, it is difficult to describe by the traditional linear regression methods. Therefore, we have every reason to doubt whether there exists a correlation among the various features used for quantifying each sample. That is, whether there exist redundant or useless information in these features. A technique commonly used in machine learning for selecting a subset of relevant features for building a learning model. We propose a machine learning technique where neural network (NN) as classifier is combined with genetic algorithms (GA) approach to classify more accurately the presence of ADHD with reduced number of attributes. The sample was drawn from 5 primary schools in the area of Bangkok. Our teacher rating scale was composed of 30 attributes and was derived from the

**ADHD: KUS-SI Rating Scales.** This ADHD dataset contains 4 classes and 1,000 students, of which 115 cases were ADHD and 885 cases were control. We divided the dataset into two parts, of which one is the training set (700 samples) is used for training the parameter of NN using a BP algorithm. On the other hand, the testing set (300 samples) is introduced for testing the ability of neural network. GANN was started with 20 randomly generated chromosomes, and then the process of calculating the fitness value, selection, crossover and mutation was iterated through 80 generations. To verify the effectiveness of NN classifier and GANN are adopted in the same experimental conditions to study classification performance of the samples for the testing sets. The experiment shows that thirty attributes are reduced to 21 attributes using GANN approach while not allowing the accuracy of the classifier to decrease. In a word, genetic neural network classifier to feature extraction enjoys overwhelming superiority in medical diagnosis to solve the issue of ADHD.

### **Keywords**

Genetic Algorithm, Artificial Neural Network, Classification, Attention Deficit Hyperactivity Disorder (ADHD), KUS-SI Rating Scales.

## 1) INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a group of neurobehavioral disorders that have a neurobiological basis with strong genetic components. It impacts multiple areas of brain functions and life activities, such as school, work, family life, and interpersonal relations, as a result of the underlying pathology. Even though clinical interviews and multiple informants both contribute to a reliable assessment of ADHD in referred samples, this diagnostic methodology is difficult in epidemiological community-based studies, in which prevalently more rapid parent and/or teacher questionnaire referenced rating scales are used as proxies for diagnosis. Owing to the complex nonlinear relationship among the main morphological features of ADHD, it is difficult to describe by the traditional linear regression methods. Among a great variety of classification techniques suggested so far for medical diagnosis neural network (NN) has been one of the most popular methods that consistently demonstrated its strengths and potentials in solving practical classification problems (Abbass, 2002; Penedo et al, 1998; Gila et al, 2009; Tan et al, 2009). As is commonly known, a great deal of information needs to be collected for the purpose of ADHD diagnosis, which inevitably leads to a high dimensional representation of the sample in the mode space. Therefore, we have every reason to doubt whether there exists a correlation among the various features used for quantifying each sample. That is, whether there exist redundant or useless information in these features. In this case, it is essential to carry out the task of feature selection, a technique commonly used in machine learning for selecting a subset of relevant features for building a robust learning model. Feature selection can discover the optimum feature subset which is rich in relevant information.

## 2) RELATED WORK

Large number of work is carried out in finding out efficient methods of medical diagnosis for various diseases. Our work is an attempt to predict efficiently diagnosis with reduced number of factors (i.e. attributes) that contribute more towards the ADHD using classification. Andreas Mueller et al (2010) classified ADHD adults by means of support vector machine which indicates that classification by means of non-linear methods is feasible in the context of clinical groups. Further, independent ERP components have been shown to provide features that can be used for characterizing clinical populations. Aleksandar Tenev et al (2011) presented a machine learning model that combines multiple classifiers for classifying adult ADHD and control groups. Classification is based on QEEG parameters such as brainrate and power spectra, taken from 19 electrodes, using the 10–20 international system. The analyzed sample included 117 adult patients (between 18 and 50 years of age) from which 67 were diagnosed as ADHD (divided in 4 QEEG subtypes according to Kropotov's classification) and 50 controls. Mona Delavarian et al (2011) presented automatic classification of different behavioral disorders with many similarities (e.g. in symptoms) by using an automated approach will help psychiatrists to concentrate on correct disorder and its treatment as soon as possible, to avoid wasting time on diagnosis, and to increase the accuracy of diagnosis.

## 3) DATA SET

The sample was drawn from 5 primary schools in the area of Bangkok. Our teacher rating scale was composed of 30 attributes and was derived from the ADHD: KUS-SI Rating Scales. The thirty attributes are listed in Table 1. This ADHD dataset contains 4 classes and 1,000 students, of which 115 cases were ADHD and 885 cases were control. We divided the

dataset into two parts, of which one is the training set (700 samples) is used for training the parameter of NN using a BP algorithm. On the other hand, the testing set (300 samples) is introduced for testing the ability of neural network. The number of attributes is reduced to 21 attributes using Genetic Search. The reduced data set is fed to the GANN models. K-fold cross validation method is used as the test mode.

Table 1: Attributes list and description

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|  |
|--|
| <b>Predictable attribute</b>                           |
| y1. normal group (t-score $\leq$ 50)                   |
| y2. monitored group (t-score, 51-60)                   |
| y3. help in education group<br>(t-score, 61-70)        |
| y4. emergency group (t-score $\geq$ 71)                |
| <b>Input attribute</b>                                 |
| 1. Moving around during class time without permission. |
| 2. Broking the teacher interrupted.                    |
| 3. Teasing friends.                                    |
| 4. Naughty.  |
| 5. Impatient.  |
| 6. Always quarrel with friends.                        |
| 7. With force.   |
| 8. Talkative.  |
| 9. Emotionally volatile.                               |
| 10. Don't think before.                                |
| 11. Playful.   |
| 12. Don't show hand allow to ask or answer questions.  |
| 13. Disrupt the classroom.                             |
| 14. Don't know waiting.                                |
| 15. Noise in the classroom.                            |
| 16. Forget homework.                                   |
| 17. Do not listen to the teacher.                      |
| 18. Working slowly.                                    |
| 19. Inattentive.                                       |
| 20. Careless operation are not thorough.               |
| 21. Must be a frequent urge to run.                    |
| 22. Inactive.  |
| 23. Easily distracted.                                 |
| 24. Don't neat.  |
| 25. Lost personal items.                               |
| 26. Irresponsibility.                                  |
| 27. Do not focus on the work being done.               |
| 28. Short attention span.                              |
| 29. Work is not finished in classroom.                 |
| 30. Don't send work.                                   |

---

#### 4) GANN APPROACH TO FEATURE SELECTION

Feature Extraction is the process of detecting and eliminating irrelevant, weakly relevant or redundant attributes or dimensions in a given data set. The goal of feature selection is to find the minimal subset of attributes such that the resulting probability distribution of data classes is close to original distribution obtained using all attributes. Genetic Algorithm incorporates natural evolution methodology. The genetic search starts with zero attributes, and an initial population with randomly generated rules. Based on the idea of survival of the fittest, new population is constructed to comply with fittest rules in the current population, as well as offspring of these rules. Offspring are generated by applying genetic operators cross over and mutation. The process of generation continues until it evolves a population P where every rule in P satisfies the fitness threshold. With initial population of 20 instances, generation continued till the eightieth generation with cross over probability of 0.6 and mutation probability of 0.033. The genetic search resulted in twenty-seven attributes out of thirty attributes is show in Table 2 and 3. Figure 1 shows our theoretical framework including neural network classifier in combination with genetic algorithm to feature selection.

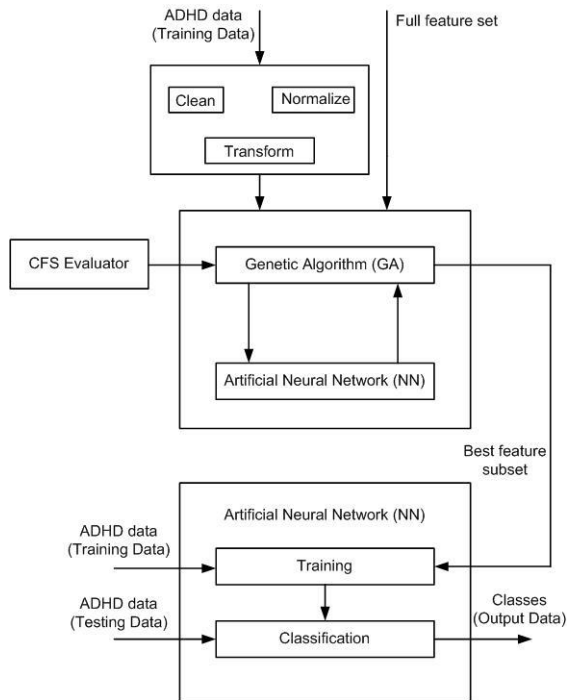


Figure 1: Overview of the GANN

Table 2: Attributes list and description

|  |
|--|
| <p><b>Attribute Subset Evaluator</b><br/>                 (supervised, Class (nominal): 31 y):<br/>                 Classifier Subset Evaluator<br/>                 Accuracy estimation: classification error<br/>                 Selected attributes:<br/>                 1,2,3,4,5,6,7,10,12,13,15,16,17,19,20,21,25,26,27,28,30 : 21</p> |
|--|

Table 3: Reduced attributes list

|  |
|--|
| <p><b>Input attribute</b></p> <ol style="list-style-type: none"> <li>1. Moving around during class time without permission.</li> <li>2. Broking the teacher interrupted.</li> <li>3. Teasing friends.</li> <li>4. Naughty.</li> <li>5. Impatient.</li> <li>6. Always quarrel with friends.</li> <li>7. With force.</li> <li>10. Don't think before.</li> <li>12. Don't show hand allow to ask or answer questions.</li> <li>13. Disrupt the classroom.</li> <li>15. Noise in the classroom.</li> <li>16. Forget homework.</li> <li>17. Do not listen to the teacher.</li> <li>19. Inattentive.</li> <li>20. Careless operation are not thorough.</li> <li>21. Must be a frequent urge to run.</li> </ol> |
|--|

25. Lost personal items.
26. Irresponsibility.
27. Do not focus on the work being done.
28. Short attention span.
30. Don't send work.

#### 4.1) Neural Network as ADHD Classifier

Classification is a supervised learning method to extract models describing important data classes or to predict future trends. Classification methods are largely used in machine learning, pattern recognition and artificial intelligence. Classification methods have numerous applications which includes risk analysis, credit card fraud detection, target marketing, manufacturing and medical diagnosis. Our work intends to use Artificial Neural Network (NN) to diagnosis the presence of ADHD in students. Neural networks (NN) have been widely used in various fields as an intelligent tool in recent years, such as artificial intelligence, pattern recognition, medical diagnosis, machine learning and so on (Goldberg, 1989). Among them, pattern recognition is a class of problem that neural network is particularly suitable for solving. BP neural network can be applied to all aspects of pattern recognition: feature extraction, data compression, cluster analysis, classification and discrimination and so forth. In fact, NN can be viewed as the mapping from input to output. If each different input is regarded as a kind of input mode, the mapping to the output is considered as output response model, the mapping from input to output is undoubtedly the issue of pattern classification. Nevertheless, learning is the first step to design classifier, that is, ascertain the requirements for the classification error rate and choose appropriate discrimination rule. Strictly speaking, the learning algorithm of NN is a supervised learning method by training feed forward neural network using error back propagation technique to determine



the parameters of neural network. When it comes to the ADHD data classification, the major steps of using neural network learning algorithm can be summarized as follows: to begin with, through the provision of training samples and the class of sample, the network prediction of each sample is compared with the actual known class label, and then the weight of each training sample is adjusted to achieve the purpose of classifying other sample data.

#### **4.2) Processing Procedure of Genetic Algorithm**

Genetic algorithm (GA) is a global optimization algorithm drawn from the evolutionary ideas and inspiration (Hornik, 1989; Goldberg, 1989). In essence, it is a direct search method which is independent of the concrete problems. GA has gained extensive application in image processing, biological science, neural networks, pattern recognition, machine learning and the like. In summary, genetic algorithm proceeds from an initial population, through a series of genetic operation, such as, selection, crossover and mutation, to search a better space step by step until reach the optimal solution. It is obvious that genetic algorithm is an optimization methodology. Here, genetic algorithm with global optimization strategies is integrated into the neural network model to improve the classification rate of ADHD diagnosis.

### **5) EXPERIMENTAL DESIGN**

#### **5.1) Data and Variables**

The sample was drawn from 5 primary schools in the area of Bangkok. Our teacher rating scale was composed of 30 attributes and was derived from the ADHD: KUS-SI Rating Scales. This ADHD dataset contains 4 classes and 1,000 students, of which 115 cases were ADHD and 885 cases were control. We divided the dataset into two parts, of which one is the training set (700 samples) is

used for training the parameter of NN using a BP algorithm. On the other hand, the testing set (300 samples) is introduced for the purpose of testing the generalization ability of neural network.

Figure 1 shows our theoretical framework including neural network classifier in combination with genetic algorithm to feature selection. At first, BP neural network is trained through 10,000 epochs, a learning rate of 0.3. What's more, we design the structure of BPNN with 30 nodes in the input layer, 4 nodes in the output layer. Our experimental studies showed that 20 nodes in the hidden layer gave the best results because a higher number caused over-training.

#### **5.2) Experimental results and Performance analysis**

Experiments were conducted with Weka 3.6.4 tool. Data set of 1,000 records with 30 attributes is used. GANN was started with 20 randomly generated chromosomes, and then the process of calculating the fitness value, selection, crossover and mutation was iterated through 80 generations. To verify the effectiveness of Back Propagation (BP) Neural Network classifier and Genetic Algorithm BP neural network (GANN) classifier are adopted in the same experimental conditions to study classification performance of the samples for the testing sets. We have trained the classifiers to classify the ADHD data set. The general and specific confusion matrix of four classes ( $Y1$ ,  $Y2$ ,  $Y3$ , and  $Y4$ ) is show in Table 4 and 5. It is a crucial measure for analyzing how well your classifier can recognize tuples of different classes. In Table 4, True positives ( $TP$ ) refer to the positive tuples that were correctly labeled by the classifier, while true negatives ( $TN$ ) are the negative tuples that were correctly labeled by the classifier. False positives ( $FP$ ) are the negative tuples that were incorrectly labeled by the classifier, while false negatives ( $FN$ ) are

the positive tuples that were incorrectly labeled by the classifier.

Table 4: Confusion Matrix obtained from classifier

|              | Predicted Class |    |    |    |    |
|--------------|-----------------|----|----|----|----|
|              | Y1              | Y2 | Y3 | Y4 |    |
| Actual Class | Y1              | TP | FN | FN | FN |
|              | Y2              | FP | TN | FN | FN |
|              | Y3              | FP | FN | TN | FN |
|              | Y4              | FP | FN | FN | TN |

Table 5: Classification Matrix for classifier

|    | Y1  | Y2 | Y3 | Y4 |
|----|-----|----|----|----|
| Y1 | 119 | 12 | 0  | 0  |
| Y2 | 13  | 45 | 11 | 0  |
| Y3 | 1   | 9  | 44 | 7  |
| Y4 | 0   | 0  | 4  | 35 |

As far as the classification performance of the model is concerned, the classification rate ( $C$ ) denotes the percentage of correctly classified samples, which is computed by the following formula (Huang et al, 2011).

$$C = \frac{n_c}{n_i} \times 100\%, \quad n_c \leq n_i$$

Where  $n_c$ ,  $n_i$  represent the number of correctly classified samples and the total number of the samples, respectively. As the results in Tables 6 show that we obtained 21 features selected by our GA approach. It can be obviously seen that the recognition rate in terms of the right classification percentage has distinctly increased, which is measured by GANN model has the classification accuracy is 81%. The modeling time using GANN technique is also greatly reduced.

Table 6: Accuracies of the classifiers for the datasets

| Accuracy (C /%)                   | Training Dataset | Testing Dataset |
|-----------------------------------|------------------|-----------------|
| Full Feature Set modeling time /s | 99.82            | 81.93           |
| Optimal Subset modeling time /s   | 98.71            | 81.00           |
|                                   | 4.19             | -               |

## 6) CONCLUSION

We propose a machine learning technique where NN as classifier is combined with GA approach to classify more accurately the presence of ADHD with reduced number of attributes. To verify the effectiveness of NN classifier and GANN are adopted in the same experimental conditions to study classification performance of the samples for the testing sets. The experiment shows that thirty attributes are reduced to 21 attributes using GANN approach while not allowing the accuracy of the classifier to decrease.

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## **Model of Knowledge Management Processes Learning in a Form e-Learning**

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### **ABSTRACT**

**The purposes of this research were: 1) to create a model of knowledge management processes learning in a form of e-Learning. 2) to test the quality of the model of knowledge management processes learning in a form of e-Learning. and 3) to compare the knowledge received before and after usage of the model of knowledge management processes learning in a form of e-Learning. The tools for this research were as following: 1) model of knowledge management processes learning in a form of e-Learning. 2) the measurement of knowledge, which will require subjects of mathematics. The example used for this experiment was a group of children between the ages of 3-5 years old in an amount of 30 people. The hypothesis of this research was the knowledge received before and after usage of the model of knowledge management processes learning in a form of e-Learning in 80/80 level. The result of the research found that when comparing scores before learning and after learning the score was followed the hypothesis specified.**

### **Keywords**

e-Learning, Model of knowledge management, Processes learning.

### **1) INTRODUCTION**

The National Education Scheme is an important policy in order to educate juveniles which are considered as a future for national. It is also a key factor to develop the country according to the objectives in many ways such as economic, social,

cultural, art and political. Education is a matter of human development for society and the country. The National Education Scheme is considered as a system that acts to produce human resources to have characters that meet the needs of society and nation. Education play role both directly and indirectly to social development and also a process that helps to develop a better mental and physical habits of different people. Therefore, policies that related to education policy are significant according to the country and social responsibility.

Countries with economic stability usually focus on money and human, particularly, people who can develop their own potential in order to cope with changing in the world effectively. It is worldwide acceptance that the potential of human in society indicate the status of social security. Therefore, potential of the human in area of thinking is important for country and social development.

The most important period to develop human learning is start from newborn to seven years old. After this time period, any promotion or supportive have less effective. During this period, human brain can be developing up to 70% then providing a method that suit the child's age is necessary. Children learn through playing which consist of happiness, appropriate environment, health care and proper nutrition. Children can develop capabilities of their brain thousands times than adult brains. Children learn everything that come into their vision and senses which are information. This information stimulates cohesive brain cells network and many connection points, enabling children to

understand and learn things that happen. The brain is acting like this until the age of 10, and then the brain will begin to remove information that is not used in daily life, leaving the rest to work effectively.

Childhood level Education has been changed and developed from theories and concepts from theorists who studied the nature of children learning from birth to eight years old for centuries. Later the new ideas and many relevant opinions occur but still follow the principles of child development. Social has been influenced the goal and education styles over the world to serve various expectations. Educators have tried to seek ideas and create new principle based on the child development and learning theory. It led to researching about teaching instruction as theoretical reasons for follow-up action. This research report had published on the field of childhood level education, which encourages agencies both public and private to aware of education for children that education for early childhood are essential. Education management included children, parents, teachers, society, and childhood level curriculum.

Education management for childhood level, School or Center must develop a quality of management to meet the standard criteria of quality assurance. To develop early childhood education in a leap forward way is like comparing the performance which in a form of learning process, sharing experiences and practices from the best schools under international rules. Also, develop the education for childhood level under the idea of school is needed to fill with new knowledge from others all the time. The school can provide outsources from other schools to apply appropriately which will save time, reduce trial and error. Learning from Champion is the route to excellence developing.

Childhood level education in the future will focus on brain development, because this age the human brain is developed by 70%

with providing learning method by child learning from direct experience. Children had to interact with people and the environment. Moreover, the moods of children are needed to be happy with appropriate environment, health care and proper nutrition. Children develop with full potential shows clearly by effectiveness and efficiency in development, child participation and understanding from parents, community and social. The role of teacher is need continuous development to be capable of teaching and researchers for managing the curriculum to suit the child's level consistent with the policies and development plans. New learning management approach is based on concepts and theories that focus on children learned from direct experience. Development of thinking processes and thinking skills, language, creative expression, adjustment well, confident and self esteem and social skills are according to multiple intelligences theory that led to standard criteria for quality assurance. Development of childhood level education by comparing the performance is one of many ways to develop form of learning process, sharing experience and practicing.

Learning concept of young children (3-5 years old) from different ideas can be summarized into three factors.

1) Principles of modern learning by serve the children as the most important part or child centred. Children learn best when done the activities by themselves (authentic activity) which require the learning process such as searching and interaction. The media and the role in classes are adjusted base on theoretical concepts of Constructivist principles.

2) Adjusting the learning process and the role teachers is learning process focused on student (Child Centred). Basic concepts of innovation that support early childhood education are from the efforts of many educators. The learning environment provides interaction between students themselves and students to teachers in order to do activities that are planned, act and

summary review. It allows children to do group activities and individual activities to develop communication skills and worked at their initiative.

3) Bringing innovations and the concept to the reform the teaching and learning requires major human philosophies parallel with processes of scientific (humanistic and scientific bases). Moreover, facilitators must have knowledge and understand of the three factors which are belief understanding in the theory, flexible in teaching style.

These factors are equally important which not necessary to use it in order. It can be applied together that depend on the situations and learning environment.

The education of childhood level is important that allows the researchers an idea about Model of Knowledge Management Processes Learning in a Form e-Learning for childhood level education. The research aims to develop math subject for childhood level students to help them learn and understand about basic mathematics. This is a way to train the skill of basic mathematical calculations for young childhood level.

## 2) OBJECTIVES

2.1) *To create a model of knowledge management processes learning in a form of e-Learning.*

2.2) *To test the quality of the model of knowledge management processes learning in a form of e-Learning.*

2.3) *To compare the knowledge received before and after usage of the model of knowledge management processes learning in a form of e-Learning.*

## 3) HYPOTHESIS

The hypothesis of this research is the knowledge received before and after usage of the model of knowledge management processes learning in a form of e-Learning in 80/80 level.

## 4) PROCEDURE

Process of create a model of knowledge management processes learning in a form of e-Learning followed the principle of the development of computer assisted instruction Interactive Multimedia Computer Instruction Package (IMMCIP) from the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi. The development of computer instructional package has five main steps as follows.

***4.1) Content analysis (Analysis) is a step to get understands the content in curriculum to put the package to determine the order of content. It prevents the duplication in topic and contents which follow the steps below.***

*4.1.1. Develop a brainstorm chart (Brainstorm Chart) for detailed study that involved with development of the entire package. The brainstorm was conducted by related researchers and the content experts. The researchers identified main focus and write it down the middle of paper or board. Then write a content that may related to the main focus using lines to link the relationship of the content. Then the experts examine and improve that is firmly relevant content, results the brainstorming chart.*

*4.1.2. Create a chart of the content topics (Concept Chart) after finish the brainstorm chart. Researchers analyze brainstorm chart in detail to identify the topics and then select the appropriate topics that able to transmit to other topics or related among the others.*

*4.1.3. Creating a chart show network of content (Content Network Chart) by analysis of the relationship of the content. The content networks chart shows an image of relationship between the relevant content. It helps determine possibility of the content order that need to be offered before, after or simultaneously. Then the researchers led to*

*the content expert examine again for improving.*

**4.2) Teaching Design (Design) in this process results as follows.**

*4.2.1. Determine the way to presenting in the package, the researcher used a content network chart that validated by experts to divided the content into units of study (Module) as well as sequencing the plan presented in chart lessons (Course Flow Chart Drafting).*

*4.2.2. Create a Learning Management Systems Chart Drafting (LMS). In this stage, the researchers designed the course management system for controlling the learning process of computer instructional package: registration records, account and passwords, personal information, learning status, learning sequence in school, scores participation checking, result and evaluation.*

*4.2.3. Create a Module Presentation Chart presented in each module to indicate continuity and the standard setting in each module which relevant to the behavioral objectives. It includes lesson introduction, content, activities to summarize the lesson content for enhance understanding. The module content and methods should be related, and then written to the table with emphasis on teaching content to support the objectives of lessons. When finished, the content experts prove needed.*

*4.2.4. Grouping the content in to Lesson Unit (Development). This process begins by writing down the content within content scope (Script), and then put them in order according to the content network chart.*

**4.3) The content on computer developed (Implementation) by selecting the computer software for lesson instruction first. Then provide the media and information which already set up for developing into a computer program by selected software.**

**4.4) Creating skills tests according to behavioral objectives. Trial with the sample group and examine the tests quality. The qualify skill tests are allowed to store in a module test database.**

*4.4.1. Analytics skills test is to implement the behavior objectives of each unit that guide for creating the tests. There are two behavioral measurements; understanding and memorization.*

*4.4.2. The Testing Management System (TMS) used in this study included Pre-Test before learning from package, and Post-test after learning. The researchers was designed that all tests are stored in the same database. Within a database, all questions are located separately by unit or module, learning objectives and behavior objectives. Within each unit questions database, questions will randomly select for the test from a database.*

*4.4.3. A test created by writing questions which three times the number of questions that actual use. It used for backup in case there are many unqualified questions. Then review the written tests again before proving by experts to determine the accuracy of the relevant content in the test. Finally, published as experimental tests in order to test the with sample group.*

*4.4.4. Examine determine the quality of the tests started by testing the questions by 30 samples and then bring the test result to evaluate the quality of the tests.*

*4.4.5. Bring the test database for evaluating the efficiency of the package and learner skills. This evaluation included the Pre-Test giving to samples before learning from the package and the Post-Test after finished learning from package. Questions in both tests were randomly selected from the database according to the behavior objectives. The samples require taking the tests on the computer for convenient..*

**4.5) Creating the assessment of multimedia method in the package. The assessment designed in format of query scale estimation questionnaire (Rating Scale) follow Likert's Scale. The criteria set into three levels; 5 mean very high qualities, 4 means standard, 3 means average, Not Pass means improving required.**

## **5) RESULT**

Model of knowledge management processes learning in a form of e-Learning research done by the following procedure:

### ***5.1) Determine the efficiency of the model and learning skills of students.***

The researchers examine the model with 30 sample childhood level students chosen by specific sampling method. The samples learned from e-Learning of mathematics subject for childhood level and used one computer per child. Teachers were assisted with the student.

### ***5.2) The researchers tested the model with 30 students to measure the effectiveness of learning skills.***

This assessment done by tested the samples with Pre-Test and then led to practice the skill with exercise when finished each unit lesson. Extra time is added to the end unit skills test for a short rest. After the sample finished the exercise tests, the researcher led the students take Post-Test and then the test results before and after learning bring to analyze.

The model in a form of e-Learning of mathematics subject for childhood level found that the effectiveness of learning in a form of e-Learning higher than the criteria set (A minimum criterion set is 80/80) and the lesson received high efficiency since:

- The developing process are according to the plan which control the quality every step follow the development of

IMMCIP (Suwanna Sombunsukho et al, 2003). The package both audit quality content and multimedia by experts. As a result, the model performance is done as specified.

- The researches designed a way to make students understand the content of the lesson more by organized activities all units of study.
- Summary lessons had been designed to summarize the content in every unit, and allow students to the view summaries back and forth, if students do not understand.
- Skills test has been designed as multiple-choice test. After students finished the package, the students tend to like mathematics and increasingly interested in mathematics.

## **6) CONCLUSION**

Model of knowledge management processes learning in a form of e-Learning of mathematics subject for childhood level can conclude by following.

**6.1) The analysis process to find the efficiency of the model are done by giving the Pre-Test to the 30 samples and led them study then take the skills test after finished each until. The results were analyzed from the test score and received higher 80/80 efficiency level.**

**6.2) To compare basic skills, when students completed the skills test, the students asked to answer the skills test by an oral communication for 20 questions which were score to 20 points. The result leads to analyze the learning skills of learners by comparing the differences between Post-Test and Pre-Test scores and received higher 60% efficiency level.**



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## Attitudes of Thai EFL Learners toward the Use of Blogs

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### ABSTRACT

**This study aims to examine the attitudes of the students as well as factors that encourage or hinder students' motivation to perform writing tasks in an EFL course at King Mongkut's University of Technology Thonburi, Thailand. The data was obtained by implementing the use of a weblog, www.wordpress.com. During the course of study, the participants were required to post at least three entries on their blogs in which more than three entries was encouraged. Furthermore, each participant had to compose a reflection about their opinion towards the use of blogs at the end of the course. As a result of data analysis, the majority of the students showed a positive attitude and reported that they would be more motivated to perform online writing tasks compared to writing on papers. Despite the fact that most students are made up of digital natives, a training session is recommended due to the lack of digital literacy of some students so that the issue of familiarity can be eliminated.**

### Keywords

Attitude, blog, EFL, motivation, writing

### 1) INTRODUCTION

Technology has been used as a tool in education for decades around the world. The most widely-used technological tools which can be seen in modern-day classrooms are computers. With the advancement of today's technology along

with the availability of the Internet access, computers have become more than instruments used to run, for example, PowerPoint slides allowing only the teacher's inputs of the lesson. By moving away from the old-fashioned styles of learning where students are mostly, or sometimes predominantly, "receivers" of inputs and welcoming other approaches, the learning process and its outcome may reveal some clues to the success of language learning.

#### 1.1) Benefits of blogs in classroom

Evidently, language learners of the present day are comprised mostly of digital natives who possess digital literacy. Moreover, this group of learners is already engaging the use of ICTs in their daily lives in which many hours per day are dedicated to this. Thus, the implementation of blogs in language classroom should be one of the means to promote positive attitude of learners to perform writing tasks compared to traditional writing styles in which the effectiveness is evident in several studies.

Blogs provide an authentic learning environment for learners to practice various skills, especially writing. Students not only have to write to satisfy the course syllabus, but also have to try to convey a message to an audience without worrying much about accuracy which serves the purpose of language learning. Numerous research findings indicate that by being in an authentic learning environment learners tend to show a positive preference for using blogs in the classroom as a tool to practice and improve their writing skills

(Bakar, Latif & Ya'acob, 2010; Montero-Fleta & Pérez-Sabater, 2010; Pinkman, 2005; Noytim, 2010). These findings also include the actual improvement in various skills as well.

Furthermore, such environment offers the atmosphere that encourages learners' creativity and self-expression and also provides an opportunity for learning to occur beyond the classroom setting (Huffaker, 2005; Montero-Fleta & Pérez-Sabater, 2010; Noytim, 2010). This allows learners to be able to blog anywhere with the Internet access and to write at their own comfort unlike writing in class where pressure may be presented which builds up their confidence in using the language (Bakar, Latif & Ya'acob, 2010). Learners are expected to be more creative working on blogs since there will be no restriction or limitation in terms of time and ideas as usually experienced in traditional writing style.

### **1.2) A gap between teachers and learners**

Prensky (2001:1) defines the new generations as '*digital natives*'—those who were born as “native speakers of the digital language of computers, video games and the Internet”— and the older ones as '*digital immigrants*' who “speak and outdated language (that of the pre-digital age)” and are in need of having to learn the new language as a compromise. He also adds that the problem of teaching *Digital Natives* learners lies in the differences of how thoughts and information are being processed by the two groups: With the advancement of today's technology information can travel faster than previous eras. This phenomenon has embedded the sense of instantaneousness to the *Digital Natives* i.e. they are accustomed to rapid communication and “thrive on instant gratification and frequent rewards” (Prensky, 2001:2). Moreover, these new generations have a preference in using

graphics and do not like to use as much text as the older ones. Additionally, Prensky (2001) suggests that using games as tools of learning seems to be more effective with the *Digital Natives* than being serious about learning that the *Digital Immigrants* are familiarized with. Consequently, these differences serve as a gap between the *Digital Natives* and *Digital Immigrants* which obstructs the teaching and learning through the use of ICTs.

### **1.3) Purpose of the study**

To find “What are students' attitudes toward writing on blogs?” in which the findings could be beneficial to teaching and learning through ICT technology in EFL classrooms and assist in merging the gap between *Digital Native* teachers and *Digital Immigrant* learners.

## **2) METHODOLOGY**

### **2.1) Participants**

The participants of this study comprised of 39 first-year undergraduate students who enrolled in LNG 102 English Skills and Strategies at King Mongkut's University of Technology Thonburi (KMUTT) in the academic year of 2011. The levels of English proficiency of the students also varied based on their educational background and/or personal interest. However, language proficiency was not considered as a criterion for selecting students.

### **2.2) Instruments**

The instrument was the students' reflection on blogs. The contents that should be included in the reflection were general comments, attitudes, feelings and/or suggestions about writing on blogs, perhaps, comparing to traditional writing styles. The reflection was analyzed to examine the reasons why the students

preferred to write on blogs or why they disliked it.

### 2.3) Procedures

*Stage 1:* The researchers created and designed a blog on [www.wordpress.com](http://www.wordpress.com). This online application was selected due to its clean appearance, richly features and ease of management.

*Stage 2:* Easy-to-follow instructions of the blogging process and a tentative schedule for lab session of each week were prepared to be followed. To ensure the comprehension of the blogging process, a total of four training sessions were carried out during the first four weeks.

*Stage 3:* Beginning of the implementation, the researchers provided the instruction on blogging and encouraged the students to write as much entries as possible without worrying about grammar points to avoid interferences with the desire to write. There was no limitation of entries in terms of topic or amount, but the minimum requirement included the following:

- Week 5: The students' opinion about online-based writing compared to paper-based writing.
- Week 6: The students' thought about an episode of a television show.
- Week 7: Any specific topic of their interest, e.g. sports, music, science and photography.
- Week 9: Free writing on any topic that they perceived to be worth sharing with friends and reflection about attitudes towards writing on blogs

*Stage 4:* The researchers collected data weekly in order to identify factors that could indicate motivation of the students. Then, the data collected cumulatively were analyzed.

### 2.4) Data analysis

The analysis was done by examining the presence of the motivational factors throughout the 9-week study period. The data consist of three variables—the amount of words, the amount of entries and attitudes. For attitudes, the researchers analyzed each reflective entry (written in week 9) to identify indicative keywords, positive and negative. Examples of positive keywords are *enjoy*, *like*, *comfortable*, *freedom* and *relax*. Examples of negative keywords include *boring*, *difficult*, *time consuming* and *technical problems*.

## 3) RESULTS

Analyzing from the total number of 39 students, Table 1 shows that almost every student submitted the first three assignments and the majority of them submitted the last assignment. The reasons for higher percentage in the first three assignments could be determined as follows:

Table 1: Statistics for minimum requirement (assignments)

| Week | Number of participants (out of 39) | Average word count |
|------|------------------------------------|--------------------|
| 5    | 37 (95%)                           | 92                 |
| 6    | 38 (97%)                           | 73                 |
| 7    | 38 (97%)                           | 143                |
| 9    | 31 (79%)                           | 127                |

- In the first assignment, the students had to write their opinion about online writing compared to paper-based writing. The average word count which is lower than the last two assignments could indicate that the topic is not familiar to the students and assigning a task to write an opinion about something that is unfamiliar could be difficult for most students.

- In the second assignment, the task was to write about the students' thoughts about an episode of a television show called *the X Factor*. The fact that the average word count for this assignment are the lowest could be because the students were assigned this task in class right after watching the video clip which might not be enough time to process their thoughts. Moreover, some of the students might not be interested in this show which is indicated by the lowest maximum word count.
- In the third assignment, the topic is the students' interests in any subject matter. The data shows that the maximum as well as average word counts rank the highest. The reasons for this occurrence could be that the students were given more freedom to write while the frame of the topic was also set.
- In the fourth assignment, to write about any topic that the students would like to share, the average word count ranks the second highest. This finding shows a contradiction to the previous assignment, i.e. more freedom should lead to more word count. An assumption could be that the students were given too much freedom which led to confusion in selecting the topic to write.

A conclusion which can be drawn from Table 1 is that there is a presence of the motivation to perform writing tasks judging from the percentage of submitted assignments. Nevertheless, these four entries were not, as a matter of speaking, encouraged but rather required. Therefore, more conclusive evidence that can truly confirm the presence of motivation is required to support this conclusion.

The data for extra posting was collected over a period of 9 weeks. Though the students were encouraged to freely write more than the four required entries, it is evident that not all of them performed as expected, i.e. only 19 students out of 39

posted extra 62 entries in addition to the ones required. Hence, the researchers decided to base the analysis of extra posting solely on data retrieved from the blogs of these 19 students. This alternative approach led to an interesting outcome indicating that 3.26 entries were written voluntarily beyond the requirements. In other words, this proves that there is a high level of motivation to write on blogs.

Blogging does not include only writing plain texts, but can also be extended to include posting media as well. Thus, a more in-depth analysis was carried out to identify the types of inputs chosen to be used in blogging as illustrated in Table 2.

Table 2: Extra posting analysis

| Input   |          | Entries   |
|---|----------|-----------|
| Written text  | Thai     | 11(18%)   |
|   | English  | 13(21%)   |
| Media   | Videos   | 29 (47%)  |
|   | Pictures | 9 (14%)   |
| Total number of entries posted                          |          | 62 (100%) |
| Average entries written/posted per participant (N = 19) |          | 3.26      |

Table 2 shows that the percentages of Thai and English entries are not significantly different. This could mean that the students did not pay much attention to what input language they used though this was an English course. On the contrary, the students preferred to post videos on their blogs more than to write text. The finding which can be drawn from this data is that the media posting feature may serve as one of the factors that motivates the students to write on blogs. That is, the students might choose to use written texts to elaborate the message they wanted to convey from the videos or use the videos to support the written text; either way, this feature provided the students with an alternative way to compose a better piece of writing with more details compared to the traditional ways.

According to Table 3, 93 percent of the students reported to have a positive attitude toward the use of blogs and only 7 percent had a negative attitude. From the negative group, there was a report that the “*lack of language proficiency*” (1%) caused some difficulties in using the blog application despite several weeks of training sessions. Such experience, as a result, led to a strongly negative feeling toward the use of blogs. “*Technical problems*” (6%) is another factor concerning negative attitude. The students who mentioned such factor in their reflective entries were all experiencing the same problem which was primarily the availability of the Internet.

Table 3: The summary of students’ attitudes toward writing on blogs

|                           |  |
|---------------------------|--|
| <b>Positive<br/>(93%)</b> | 1) Good experience (19%)                     |
|                           | 2) Practice language skills (18%)            |
|                           | 3) Convenience (14%)                         |
|                           | 4) Prefer online tasks (12%)                 |
|                           | 5) A place to share (7%)                     |
|                           | 6) Unique features (6%)                      |
|                           | 7) No concern for accuracy (4%)              |
|                           | 8) Will continue blogging (4%)               |
|                           | 9) Important for future study or career (3%) |
|                           | 10) More confident to write (2%)             |
|                           | 11) Freedom to write (2%)                    |
|                           | 12) Freedom to express ideas (2%)            |
| <b>Negative<br/>(7%)</b>  | 1) Technical problems (6%)                   |
|                           | 2) Lack of language proficiency (1%)         |

From the positive group, 19 percent mentioned explicitly that they had “*good experience*”. The second highest-ranked of 18 percent perceived the use of blogs as an opportunity to “*practice language skills*” outside regular classroom sessions. Other positive factors to be discussed concern the nature of the tasks: The students who reported that doing online tasks is

“*convenient*” (14%) also had a “*preference*” (12%) to do this type of tasks in future courses. The most common reason for being convenient is that tasks could be accomplished and submitted anytime and anywhere. This quality, therefore, promotes the “*freedom to write*” (2%) and “*freedom to express ideas*” (2%) since the students could do the tasks at their own pace and convenience without being looked over the shoulders by the instructors or being confined in a formal learning environment. Moreover, by doing tasks online the students were able to easily “*share*” (7%) their ideas as well as view others’ in the online community. These factors then facilitate the “*will to continue blogging*” (4%) on, of course, those who already possessed high language proficiency.

As for the “*unique features*” of the application, the researchers’ intention was to primarily utilize the spelling and grammar checking feature in order to mitigate the concern for accuracy in which 6 percent of the students found to be useful. This feature along with an opportunity to practice language skills also fostered the “*confidence to write*” in 2 percent of the students.

Lastly, 3 percent of the students stated that engaging in online writing activities through the use of blogs helped them acquire digital literacy skills that are “*important for future study or career*”. These individuals were parts of the students who saw an opportunity to practice their language skills from blogging.

#### 4) DISCUSSION AND RECOMMENDATIONS

Findings from this study have revealed the attitudes as well as the effectiveness of the use of blogs to promote the motivation to perform writing tasks of Thai EFL students as follows.

Though accuracy of the written language was not emphasized in this study, some students described that they had to employ grammar skills when blogging. As a result, the students' perception of blogs as tools to practice language skills ranked the highest. This finding can be supported by a previous study (Noytim, 2010) in which the students claimed that their writing and reading skills were enhanced through the use of blogs. Also, Bakar, Latif and Ya'acob (2010) found that almost all of the students strongly believe that blogging assisted them in learning to write better which is similar to the finding of Fageeh (2011). In addition, since this is the digital era and this group of students was born *digital natives*, the researchers' hypothesis that the use of blogs being a preferable choice of writing tool was shown to be veridical.

Each blog also serves as a personal space for individuals to share ideas and thoughts in which the audience can take part in exchanging ideas and thoughts through comments. This sharing and exchanging of ideas or feedback is shown to be promoting positive attitude in which Bakar, Latif and Ya'acob (2010) discovered that using blogs as a place to communicate foster more confidence and comfort of students in expressing their ideas compared to face-to-face communication.

On the contrary to the aforementioned findings, the research study of Top, Yukselturk and Inan (2010) yields a contradicting result: The students engaged in blogging with concerns only to fulfill the minimum requirements of the course. As a result, the motivation to participate in blog activities was not present. Other studies (Homik and Melis, 2006; Divitini, Haugalokken and Morken, 2005 cited in Top, Yukselturk and Inan, 2010) have confirmed this result as well. It is suggested that teachers' attitudes and beliefs should be taken into consideration in the successful implementation of blogs

in classroom (Top, Yukselturk and Inan, 2010). An observance which can strongly support this suggestion is evident in the present study where the instructor's attitude towards the ideas of freedom and convenience (i.e., allowing the students to surf other websites such as Facebook other than just to engage solely in blogging for the course) fostered the motivation to engage in blogging.

## 5) CONCLUSION

It is inconclusive that using blogs can effectively promote learners' motivation to actively perform or engage in writing tasks in contrast to using traditional writing methods; however, numerous studies have shown that this type of CALL tools can bring about benefits to both language learners and teachers. When implemented properly and strategically, blogs and other CALL applications might as well be the key to potentially bring forth the success in language learning and teaching and merge the gap between the *Digital Natives* and *Digital Immigrants*.

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## Compiler on the Web: Remote Laboratory for e-Learning (IEC2012)

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### ABSTRACT

**In learning computer programming, an important aspect is about acquiring programming skill. Students must be able to write, compile and test their programs and see the results in order to gain that skill. Most of supporting software for e-Learning is available as standalone software installed on a PC. However, for the ease of use, for uniformity and up-to-date maintenance, the software as web applications are most suitable. We present a case study of a compiler to support learning embedded system programming. The students can access the compiler via a web browser. The target machine is available online for testing of students' program. This is a remote laboratory that support e-Learning. It unifies the learning environment. The laboratory experiments can be performed remotely and inexpensively.**

### Keywords

Compiler, e-Learning, Remote Laboratory.

### 1) INTRODUCTION

To acquire programming skill, tools must be available for students to practice and to get immediate feedback. For a normal laboratory classroom, personal computers provide invaluable tools for programming practice. Most programming classes taught popular programming languages such as Java and C. The compilers are easily available for such machines. The "off-line" mode of learning programming is the most widely used method because of

the simplicity in its arrangement. However, for a specialized class in programming such as programming for an embedded system, the equipment may not be available in quantity. The reason may be the cost or the need for special equipment. Such laboratory session usually includes the set up for external peripherals such as the motion of motors, the sound and the sensors. These peripherals are attached to the computing platform. Students practice on this kind of platform requires feedback through watching the behavior of the peripherals. It is possible to share this kind of environment to several students in the on-line fashion. Students can watch the peripherals through the video. They can practice programming and experiment with the system through the web.

### 2) THE ENVIRONMENT

We present a case study of a compiler to support learning embedded system programming. The students can access the compiler via a web browser. The target machine is available online for testing of students' program. We will call the station for students a "workstation." A workstation includes an embedded system board, a PC for controlling the board, a camera to observe the result. The PC also works as a server that provides access to the workstation.

The embedded system board is a 32-bit multi-core embedded processor. The processor, named Propeller, is made by Parallax [1]. It has eight independent processors. These processors can work simultaneously and independently with a

central shared memory. We are interested in this processor because it represents a high performance but low cost system that can be used in industry. Programming this new system also posts a challenge. Therefore it becomes a target of our classroom on the web.



Figure 1. Propeller Laboratory

To program this system, we modify our existing teaching language, Rz [2]. A compiler has been written to target Propeller (Rz has quite a few other target machines). To give a flavor of the language, a short introduction to the language will be given here. Rz has a C-like syntax. The language is a subset of C without type. There is only one type, Integer. There are two kinds of variables: global and local. Global variables have to declare before use. Local variables are automatically declared. The array of data can be declared as a global variable. The array can only have one dimension. Various kind of operators are available: +, -, \*, /, ==, !=, <, <=, >, >=, !, & &, ||, \* (Dereference), & (address). For example, Program adding number in Array RZ as follows.

```
main (){
    sum = 0;
    for( I = 0 ;i< N ;i++ ) {
        sum = sum + a[i] ;
        print ( "Sum is ", max );
    }
}
```

When using the parallel compile (Option added in to compile the RZ) can adjust to do this (Pseudo Code).

```
for (j = 1 j < log2N; j++) {
    for all CPUs in Propeller {
        if ((k + 1) mod 2j) = 0 {
            x[k] := x[k - 2j] + x[k]
        }
    }
}
```

We will not discuss the compiler for parallel computation here. The main aim of this paper is to illustrate the work on wrapping the "workstation" and make it available to the web.

### 3) DISTANCE-LEARNING REMOTE LABORATORIES [3]

The remote laboratory is defined on the basis that the operation of experiments are conducted remotely by computer. Students do not need to be demonstrated at the real lab but they can access and control via the network medium. The operation of the remote laboratory is shown in Figure 2. The workstation can be accessed remotely and students perform laboratory experiments in the laboratory via the Internet. Setting up the propeller experiments can be performed by different people and they can test the experiment in their own time.

All results are stored in a database that can be retrieved, analyzed and displayed later.

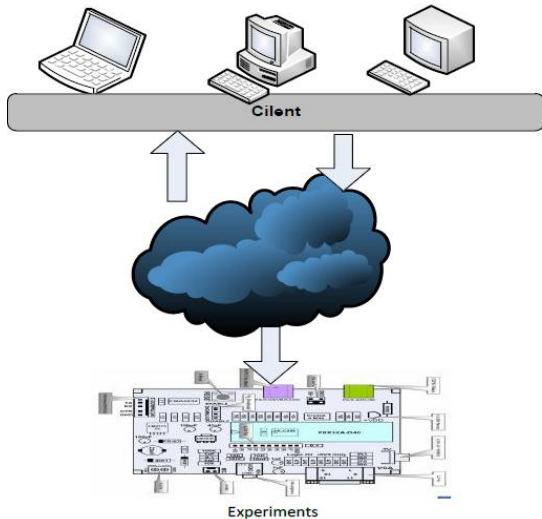


Figure 2. Network Control of a Remote Laboratory Model

### 2.2.2. Distance-Learning Remote Software Description.

The software of remote operation focuses on a web-application and works for the user interface and controls of the laboratory. They are shown in Figure 3.

The components of the remote laboratory are Java web-based infrastructure, which are created by Enterprise Java Bean (EJB) [4] application.

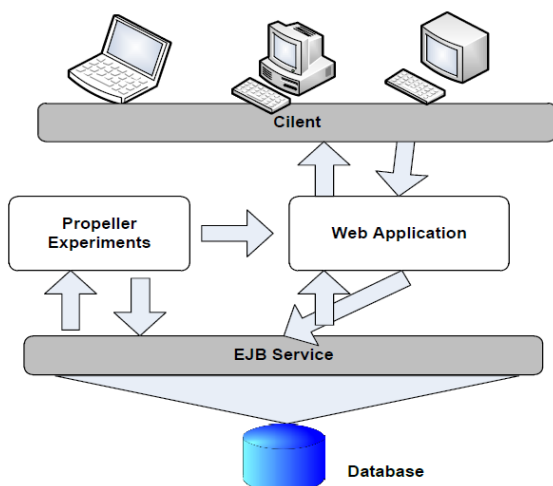


Figure 3. The Software Architecture.

Students access to workstation laboratory and code the program in a web page. It

consists of the text area, button, and other components to accommodate the students to work easily (Figure 4).

### Code Edit

Please insert code here:

Compile

### Compile result

Figure 4. Webpage for coding

Students submitted the code to a compiler. The RZ compiler's command is called by EJB service and the compiled file is stored in database. The output of the compiler will be displayed in webpage and is stored into database.

Students can execute the compiled file for testing the program. The Propeller's command is called by EJB service. The result of program will be recorded in a video format. It is also stored in database. Students can display the result in webpage and they can post it into social network (Facebook, twitter) or web-board.

### 2.3) Conclusion

The concept of the laboratory over the Internet has been proposed and realized. The prototype for the software has been implemented in Java. The workstation was installed. Students can access to the workstation from the web. They can conduct experiments and collect data. The ability to access remotely is very important for e-Learning.

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