Mobile Learning Project

Leslie Richards

Ubon Ratchathani University Thailand Igrichards@uwaterloo.ca Utith Inprasit Ubon Ratchathani University Thailand utith@sci.ubu.ac.th Phichit Sophakan Ubon Ratchathani University Thailand_sphichit@hotmail.com

Abstract

Until now, the options available to those living in Thailand's rural communities (75% of the population) who wish to pursue a university education have been limited. Distance from a university, the need to live on or near a university campus, cost, time limitation and family commitments, such as the need to continue to work within their rural community, are all factors that have inhibited the majority of the population of Thailand from gaining a university education. UBU (Ubon Ratchathani University) has developed the concept for Mobile Learning, primarily aimed at rural residents who have historically been isolated from the opportunity to obtain a university education.

In order to reach the greater student population beyond their main campus location, universities traditionally establish satellite campuses or a learning centre's to provide students with access to information and communications technology. However, these facilities are usually located within larger communities and are, for the most part, not convenient for the majority of the rural population of Thailand to access. At the time of their conception, satellite campuses and remote learning centre's were the only options that universities had available to them. What made the Mobile Learning Project possible was the outcome of two main factors:

- 1. Present day telecommunication is faster, can reach all corners of Thailand and is inexpensive; especially when compared to the cost developing and servicing satellite campuses and learning centre's (and their limited return on investment).
- 2. In 2008, UBU completed an extensive pilot study on 'Teaching without Lectures' and the effect on students' learning outcome ('T5-TwL', Richards, Inprasit, and Wattanataweekul, 2009). The results showed that lecture-based learning actually inhibited students' ability to advance academically.

'Teaching without Lectures', along with technology, opened up a totally new and flexible teaching and learning strategy for UBU. Students can decide where, when, and how their learning occurs. UBU is moving away from the lecture-centred model and all its inherent instructional challenges, to a process that allows students to develop their own learning strategies, are motivated and build confidence in their ability to learn (this approach should not be confused with traditional distance programs; which are lecture-based learning and have the same academic challenges as on-campus programs).

Keywords: T5 model; mobile learning; teaching without lectures

1. Introduction to Mobile Learning

Changes in technology over the past few years have removed a number of physical and economic barriers for those living in Thailand's rural communities wishing to pursue a university education. However, these advancements in technology are not what stimulated a major shift in Ubon Ratchathani University's (UBU) teaching and learning strategies. What changed their pedagogical thinking was the outcome of a pilot study conducted at UBU in 2008 on 'Teaching without Lectures' and the effect on students' learning outcome ('T5-TwL', Richards, Inprasit, and Wattanataweekul). The results showed that lecture-based learning actually inhibited students' ability to advance academically. Teaching *without* lectures opened up a whole new teaching and learning strategy and opportunities that is academically and professionally more rewarding for both the student and their instructor.

This change in strategy enabled UBU to develop Mobile Learning, a flexible teaching and learning strategy that allows students to decide where, when, and how their learning occurs. This change has allowed UBU to begin to implement a 'one course- one instructor' teaching and learning strategy for both remote and on-campus students:

- Students will no longer need to leave their rural communities in order to work towards gaining a university degree. Mobile Learning takes the university to the students, regardless of where they reside, making a university education accessible and convenient for all Thais, especially for those living in the rural communities of Thailand.
- UBU no longer needs to establish satellite classrooms (costly to maintain and service with quality instructors) or; create two separate courses to service both remote and on-campus students (one course one instructor). Courses will consist of both on-campus students and remote students. The student decides to either engage in learning remotely or engage in learning within the campus community or both.
- No limit to class size, plus no need to expand existing 'fixed' classroom space.

2. Mobile Learning Project

Until now, options available to those living in Thailand's rural communities, wishing to pursue a university education, have been limited. Distance from a university, the need to live on or near a university campus, cost, time limitation and family commitments, such as the need to continue to work within their rural community, are all factors that have inhibited the majority of the population of Thailand from gaining a university education. UBU has developed the concept for Mobile Learning, primarily aimed at rural residents who have historically been isolated from the opportunity to obtain a university education.

Historically, to reach the greater student population beyond their main campus, Universities established satellite campuses or remote learning centre's to provide students with access to information and communications technology. However, these facilities were usually located within larger communities, thus requiring those living in rural areas to travel to these centres. They are, for the most part, not convenient for the majority of the population of Thailand to access. At the time of their conception, satellite campuses and remote learning centre's were the only options available to universities.

With Mobile Learning, students will not have to leave their rural communities in order to work towards gaining a university degree. Mobile Learning takes the university to the students,

regardless of where they reside. Mobile Learning makes a university education accessible and convenient for all Thais, especially for those living in the rural communities of Thailand.

With financial support from the National Telecommunications Commission of Thailand, the telecommunications industry of Thailand and Ubon Ratchathani University, Thailand, the following technology support will be available to all students enrolled in the Mobile Learning Project:

- Free online access to their university program for duration of the project (5 years)
- A high speed USB air card (or equivalent) will be provided to any student who does not have remote or mobile internet access
- A special mobile laptop program will be established to accommodate students (oncampus and remote) to have access to a computer.

2.1 Scaffolding Mobile Learning

UBU are moving programs into Mobile Learning in two stages. During the first stage, programs and their courses will be converted to the 'Teaching without Lectures' strategy. This first stage that in effect commenced in November, 2008 with the Pilot Study has a growing number of programs using the TwL strategy – thereby joining stage one. During stage one, Mobile Learning programs are offered to on-campus students only. This allows each program's teams and course instructors to experience the re-design process and essentially pilot this strategy on-campus. Change to an instructor's teaching and learning strategy is understandably a sensitive and difficult change for instructors to accept and to design for. However, once instructors start engaging in the 'Teaching without Lectures' strategy, adaption occurs with little or no backlash.

During the second stage, the Mobile Learning phase will open up courses to allow students the flexibility to decide where, when, and how their learning occurs. This in turn will open up the programs and their courses to the rural areas of Thailand. The first offering of courses in the Mobile Learning Project is will likely begin November 1, 2010.

2.2 Rural and On-Campus Students

A directive from the Ministry of Education, Thailand, requires universities to provide a greater opportunity to Thai's living and working in the rural areas of Thailand. Up until now, penetration into the remote regions of Thailand by universities have been costly for both the learner and university and resulted in limited success. UBU, located in the North-East area of Thailand, is mandated to service both rural and urban communities. The Mobile Learning Project is being implemented to specifically address the rural problem.

UBU will initially target a minimum of 10-20% of students who will remain in their local communities to engage in their selected programs. Overtime, as students recognize the benefits and flexibility of mobile learning this could increase to 50+%.

3. Teaching without Lectures Pilot Study

In 2008, UBU completed an extensive pilot study on 'Teaching without Lectures' and the effect on students' learning outcome ('T5-TwL', Richards, Inprasit, and Wattanataweekul, 2009). They put forward the argument that lecture-centred instruction interferes with students' ability to

advance beyond their university entrance GPA (Grade Point Average). By moving away from the lecture-centred model and all its inherent instructional challenges, to a process that allows students to develop their own learning strategies, students are more motivated and build confidence in their ability to learn. Traditionally, students' university entrance GPA (Grade Point Average) reflects their learning outcome potential as university students. "The GPA (Grade Point Average) is a testament of what you [students who are applying to a university] are capable of" (Jeanette Leach, 2009). A number of universities implement a 'predicted GPA', derived from students' entrance GPA that, although traditionally lower, ultimately equates to their graduation GPA. Therefore, we can only assume that maintaining a student's entrance GPA is the standard that most universities aim for, or are capable of, and no more. Universities with a high (GPA) entrance requirement are virtually assured that their students will have the ability to better succeed in mastering a university lecture-centred teaching and learning system and will graduate with the same (B+ to A) GPA as their entrance GPA.

3.1 The Challenge for Ubon Ratchathani University

Ubon Ratchathani University (UBU), located in the North-East area of Thailand, does not enjoy the same advantage as universities that are able to set a high GPA entrance requirement (B+ to A) to their programs. UBU's combined average for all programs over a four year period (2005-2008), shows no significant difference between students' entrance and graduation GPA (with a standard deviation of -0.4756 GPA on a four point scale). UBU instructors have successfully navigated their lecture-centered education; therefore, it may appear reasonable for them to assume that if they were able to learn within the traditional lecture-centered method, their students should also be able to learn by this method as well. However, the entrance GPA of UBU students is considerably lower than that of their instructors' (when their instructors were undergraduates), therefore, unlike their instructors, the majority of UBU undergraduate students are not absorbing, remembering and recalling the large volume of information being transmitted to them via lectures. Subsequently, if learning does not happen, instructors tend to fault the lack of positive learning outcome on the students.

In an attempt to rectify poor learning outcome, UBU, as well as other universities internationally, will replicate lecture-centred instruction in a variety of media to provide students with additional access to lecture content outside the classroom. Although this generates little or no change in actual learning outcome, it does support traditional teaching and learning methodology. Barr and Tagg (1995) point out that "An instructor is typically evaluated by her peers or dean on the basis of whether her lectures are organized, whether she covers the appropriate material, whether she shows interest in and understanding of her subject matter....They do not raise the issue of whether students are learning, let alone demand evidence of learning...Many institutions construe teaching almost entirely in terms of lecturing."

3.2 Radical Change in Teaching and Learning Methodology

UBU offers excellent academic programs with highly qualified instructors who are dedicated to the improvement of learning and the quality and abilities of the students who graduate from their programs. However, improving or matching the graduation GPA of universities that preselect students based on their high entrance GPA appears to be impossible within the established teaching and learning strategies at UBU. Like other universities, UBU has held the position that

the lecture-centred method is central to learning. If the lecture-centred method of teaching impedes the possibility of improving students' learning outcome, the challenge for UBU is to make a radical change in their teaching and learning methodology. "Contemporary learning theory is based upon the notion that learning is an active process of constructing knowledge rather than acquiring knowledge....rather than a process of knowledge transmission." Duffy & Cunningham (1996).

4. Teaching without Lectures

To begin exploring different teaching and learning strategies at UBU, a new course design method TWL (Teaching *without* Lectures) was introduced to their teaching strategies. The TwL method transfers the responsibility for students gaining knowledge and skills *from* the instructor *to* the student. The TwL method incorporates tasks, tools, tutorials, topics and teamwork to achieve ongoing student engagement, ongoing constructive feedback and ongoing measurement of learning outcome.

UBU took the following steps in assessing the value of Teaching *without* Lectures:

- Establishing a Learning Design Centre to support the deans, program directors, program curriculum teams and instructors, to explore methods of improving learning outcome;
- Conducted TwL awareness sessions for instructors and program curriculum teams to guide their understanding and implementation of the new course design process;
- Announced a Pilot Study for the TwL course design method;
- Developed D4L+P, Designing for Learning plus Portfolio (Sophakan, 2008), an online course development, delivery, monitoring, authenticating and portfolio tool designed specifically to support the TwL method;
- Assessed Pilot Study learning outcomes of Teaching *without* Lectures.

4.1. The UBU TwL Pilot Study

Phase I of the TwL Pilot Study at UBU started in early 2008 with the re-design of a mathematics course, Elementary Linear Algebra. When compared to the previous offering, the TwL method showed an average increase of 8.86% in the midterms and 18.68% in the final exams. These results showed enough promise that the Pilot Study was expanded to twenty two courses (Phase II).

In Phase II, the majority of courses were within the Faculty of Science: Biology, Chemistry, Computer Science, Information Technology, Mathematics and Physics and; three courses were within the Faculty of Engineering. All twenty-two instructors attended the TwL workshop in May, 2008 and completed the re-design of their courses by the end of October 2008. In November 2008, all twenty-two courses were offered with a combined enrollment of 1,742 students (largest class size was 249). At the end of term, March 2009, instructors and students were asked to complete a survey of the TwL method.

4.2 Outcome

Traditionally at UBU, the average entrance GPA of students would be reflected in their midterm and final marks in the majority of their courses. A student entering UBU with a C- average will maintain that average throughout most of her courses and will graduate as a C- student. The big question was: would the TwL method improve students' exam grades? For ten of the twentytwo courses involved in the Pilot Study, we were able to compare the final exam marks between the TwL and these same courses when they were previously offered with the traditional lecturecentred method. The results showed that for 741 students enrolled in courses using the TwL method, their final exam average was 17.31% higher than the 515 students enrolled in the traditional lecture-centred courses. Introduction to Biology II *(235 students),* was taught by different instructors for each of the first and second-half of the course. For the first-half of the course, which was taught using the TwL method, students gave an overall approval rating of 82.97% for this method of learning, with 92.6% indicating they found class-time engaging and motivating. The grade of the first-half mid-term exam was 7.9% higher than the second-half final exam. The instructor for the second half of the course did not implement the TwL method.

4.3 Changes in Attitudes

The students' survey results showed a substantial shift in their attitude towards learning and taking responsibility for their own learning (85.69% indicated that this method of learning was more rewarding than attending lectures). Without this change, we could not anticipate a change in students' learning outcome. The results of the survey completed by thirteen out of the twenty-two instructors showed a marked change in their teaching philosophies and increased confidence in their ability to contribute to their students' learning.

Six of the twenty-two courses involved in the pilot were within service courses in mathematics. Traditionally, the attitude of UBU students enrolled in mathematics service courses has impeded learning outcome. A summation of the students enrolled in the six mathematics courses (161/413) showed a strong shift in students' attitude:

- 88.31% Had a better appreciation for learning;
- 85.16% Felt better prepared for class-time;
- 83.83 % Felt more confident about their abilities to learn;
- 91.14% Developed more critical thinking and problem-solving abilities;
- 86.17% Felt better prepared for writing exams;
- 96.34% Felt time spent with instructors was engaging and rewarding;
- 89.88% Found course motivating.



Image 1. Student engaging remotely (Stage 1)



Image 2. Students working on team task (Stage 1)

5. TwL Design Method

The TwL method of course design is based on Carey's T5 model, developed as an approach to instructional design at the University of Waterloo, Canada. The model emphasizes "*Tasks* (learning tasks with deliverables and feedback), *Tools* (for students to produce the deliverables associated with the tasks), *Tutorials* (online support/feedback for the tasks integrated with the tasks), *Topics* (content resources to support the activities) and *Teamwork* (role definitions and online support for collaborative work)", (Salter, Richards & Carey, 2004).

5.1 Learning Outcome

Defining knowledge and skills students will have mastered (upon graduation) cannot be stated as goals at the program level or objectives at the course level. Determining the learning outcome of students within a program (along with authenticating learning outcome) is the sole responsibility of the "Program Curriculum Team". TwL and the tool D4L+P provide curriculum teams and course instructors with a model and tool to guide, monitor and authenticate learning outcome. UBU's directive to academic programs:

- All students graduating from their program will have mastered (mastery authenticate) the 5 domains of learning (knowledge, cognitive skills, analytical and communication skills, inter-personal and responsibility skills, ethical and moral development.
- Program learning outcomes (5 domains) are mapped to each course in their program to indicate what learning outcomes each course is to address.
- Instructors then map their course to their assigned learning outcomes and specify what outcome their student will master at the end of each week of their course (15weeks).

Authenticating learning outcomes at the program level is derived from:

- 1. Formative: Assessing students' effort towards correctness in mastering learning outcome.
- 2. Summative: Assessing correctness in mastering learning outcomes (mid-term and final exam)

5.2 Learning Activities to Guide Mastery of Learning Outcomes

At the core of TwL is an innovative 'learning activity' that challenges and motivates students to engage in learning that builds confidence and enables the students to independently and collaboratively construct meaning in their learning. This results in higher levels of student participation and learning outcome. To attain the required learning outcome, a series of weekly learning activities allow the students to build towards mastery of program learning outcomes.

Each weekly learning activity consists of:

- A challenging learning task for the students to engage in;
- Criteria (foundational knowledge) or conditions required as part of the students' solution;
- Course materials (which contain, the general foundational knowledge);
- Individual effort;
- Collaboration with peers;
- Ongoing feedback;
- Assessment based on effort towards correctness;
- Culminating in a one hour class-time with the course instructor (face-to-face, virtual or both)

5.3 Learning Task

"Learning tasks pose an open question; students respond by engaging with course material. The single most important factor shaping learning outcomes is the way in which students approach a learning task ..." (Jackson & Anagnostopoulou, 2001).

An open question allows students to express their understanding when:

- They are engaged in applying, analyzing, evaluating or creating
- They are applying specified criteria (foundational knowledge) to their solution.

According to Bloom's Taxonomy (1956), "The traditional learning paradigm implies a fixed order; before a learner can advance to higher order thinking, like applying, analyzing, evaluating or creating; they first need a solid understanding of fundamentals or a solid foundational knowledge." TwL method, foundational knowledge is specified by the instructor as part of the criteria or conditions required in order for students to master a task. The instructor designs weekly tasks that challenge the students in applying, analyzing, evaluating or creating. This introduces entry level students to higher order thinking at an early stage and helps them to maintain their understanding and memory of foundational knowledge. As students move into advanced courses, they are better prepared to move directly into advanced applications. As Brownstein (2001) indicates, "Learners should constantly be challenged with tasks that refer to skills and knowledge just beyond their current level of mastery. This will capture their motivation and build on previous successes in order to enhance the confidence of the learner."

5.4 Primary Components of TwL

The primary components of a TwL course are:

- <u>Learner Engagement</u> (50% of course time): Students engaging in challenging activities towards mastering the required knowledge and skills.
- <u>Constructive Feedback</u> (50% of course time): Students giving and receiving constructive feedback to each other and the instructor giving constructive feedback to students in class-time.
- <u>Learner Collaboration with Peers (2/3 of all learning activity)</u>: "Collaboration is a process by which individuals negotiate and share meanings relevant to the problem-solving task at hand." (Roschelle & Teasley, 1993).
- <u>Resources:</u> formal lectures are eliminated and replaced with resources (textbook, etc.) (defined by instructor as criteria to assist students in mastering learning activity).

5.5 Primary Role of Instructor

The most important responsibilities for the instructor are: to monitor students' progress towards mastering the required knowledge and skills and; to guide students towards understanding and correctness through constructive feedback, culminating in a weekly one hour class-time (face-to-face or online). Class-time is an opportunity for the instructor to focus on guiding the quality of learning outcome rather than knowledge transmission. Class-time for the students is an opportunity to engage in learning outcome discussions. Assignments are replaced with weekly tasks that represent 20-40% of the students' marks. Formative assessment, as opposed to summative assessment, is based on *'effort towards correctness'*. This formative assessment is carried out by the student's peers - not the instructor.

A number of UBU instructors indicate that in order for students to learn, especially new information, the instructor needs to "give" this information to their students in the form of a lecture. According to Alan Guskin (1997), "students retain less than 20 percent of what they were taught one week after the lecture" (plus, factor in absent or students with their own agenda).

5.6 How TwL Scaffolds Learning Activity

Within each learning activity, there are five stages in which students, individually and collaboratively, engage in mastering each weeks learning activity. The process builds confidence and enables students to independently discover and collaboratively construct meaning. With students' participation in weekly learning activities, higher levels of learning outcome are achieved. Students provide and receive ongoing feedback; develop and improve their listening and communication skills and; with a higher understanding of the problem, the students can engage in class-time discussion for deeper understanding. Class size and the providing/receiving of ongoing constructive feedback is no longer a concern for instructor or students.

Stage 1 The student is given a task, an open-ended question, requiring her to state what she believe is the correct solution to the problem. Working independently, the student needs to make an effort to master the learning task.

Stage 2 After submission of her task, the student will receive three submissions from her peers (classmates). She will not only see the solutions of her peers, she can re-think the problem by comparing her own submitted solution to that of three peers. The student must: review the three submissions and provide constructive feedback to each of the three peers and; rate the effort each peer made to produce the solution (5 point scale). *The identity of the peers is not disclosed to students*.

Stage 3 In turn, the student receives anonymous feedback from three of her peers on the task she submitted. The student must: review each feedback provided and; rate the effort each peer made in giving her feedback (5 point scale). *The identity of the peers who gave the feedback is not disclosed to the student*.

Stage 4 The student is then placed within a team of four and will know the identity of her team members. The team is assigned either the same task or one that is more challenging to work on collaboratively. Students must: engage with their team members to complete the team task and; rate the effort each team member contributed to the completion of the team task (5 point scale). *Although the identity of team members is known to students, they do not know how they were assessed by individual team members*.

Stage 5 The instructor and students engage in either face-to-face or online discussion of the week's learning activity. The learning environment shifts the role of an instructor away from introducing new information to students in the form of a lecture to: guiding and responding to the students based on their independent and collaborative effort towards mastering a problem (stages 1-4). This instructor: reviews either all or some of the team submissions. The instructor then guides students through any misunderstandings/problems and discusses the challenges that individuals and teams encountered in preparing their tasks.

Typically, if an instructor lectures three hours per week, then two of these hours would be transferred to the students to work on Task 4 as a team, and the third hour would be for students' class-time with the instructor. With the TwL learning environment, an instructor is expected to spend three to four hours per week monitoring and one hour per week facilitating class-time for the duration of the course. The student is expected to spend three to six hours a week engaged in

solving an application and one hour engaged with the instructor in class-time. "The theory [that]...learners learn by becoming involved...seems to explain most of the empirical knowledge gained over the years about environmental influences on the learner's development." (Astin, 1985).

Diagram A: The five stages within each weeks learning activity				
Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Individual effort	Feedback to peers	Feedback from peers	Team task	Instructor's time
Due date: Jul 17	Due date: Jul 19	Due date: Jul 20	Due date: Jul 21	Date: Jul 22
1	234	567	8	•

Stage 1: Sample 1 Draw a structure for each of the following compounds and then compare their properties in terms of solubility in water and boiling point. 1.1) propanoic acid, 1.2) pentane, 1.3) 1-butanol, and 1.4) 1-butanamine. Give IUPAC the name of the following structures and then compare their basicity.



Stage 1: Sample 2 The various regions of Thailand have subtle or distinct differences. I want you to analyze the six regions of Thailand and define what these differences are and what contributed to these differences. Criteria: Make sure that you have identified the meaning and importance of national culture and heritage. Plus, there are a number of "World heritage sites" in Thailand that have been recognized by international communities as important contributions to world culture.

5.7 Formative Assessment

Formative Assessment: Encouraging the students to make an effort for which they are subsequently provided feedback is the key to their mastery of learning. Within each learning activity, students are assessed by their peers on the effort they made towards mastering a task. Within each learning activity, the student will be assessed nine times. Two-thirds of the assessment is provided by peers who are anonymous to the student, and one-third provided by known team members. Peer assessment is based on effort towards correctness. Knowing their peers will be reviewing and providing assessment motivates and stimulates students to make their best effort. The criteria for peer assessment are defined by the instructor. "Experiences revealed that peer-assessment, as a formative assessment method and as a part of the learning process, can be valuable because students are more involved both in learning and in the assessment process and because they find it fair and accurate." (Sluijsman, Docky and Moerkerke, 1996).

Disadvantages of peer assessment, such as friendship marking and decibel marking, are resolved by the online tool, D4L+P, which conceals the identity of the peer a student is assessing and flags any discrepancy for the instructor to review. Plus, friendship marking in team-tasks goes from 93% (assessing team members efforts) to 64% after the second week of the course.

5.8 Monitoring and Authenticating Students' Mastery of Learning

Monitoring and authenticating students' mastery of the 5 domains of learning (5.1) is accomplished at three administrative levels by the D4L+P tool:

Program Directors'/Deans' Level: Define learning outcomes for graduating students and; monitor performance and quality of learning outcomes across programs and of individual courses within programs.

Instructors' Level; Define learning outcomes of students within their course; monitor performance and quality of learning outcome across their course and; monitor performance and quality of learning outcome of individual students within their course.

Students' Level: Monitor their performance within a specific course, comparing their performance with the established learning outcomes for that course and; monitor their performance within their program, comparing their performance with the established learning outcomes of their program.

Diagram B: Monitoring and authenticating performance of program, course and student



6. Conclusion

The Directorate for Education, within the Organization for Economic Co-operation and Development (OECD), is carrying out a feasibility study, Assessment of Higher Education Learning Outcomes (AHELO). The AHELO feasibility study explores four complementary strands referred to as 'The Four Strands'. Strand 4, 'The Value-Added Strand' states that "it is no surprise when an A+ student walks out the doors as an A+ graduate. But what about a B student who finishes with an A, his or her programs would have a higher added value than the programs at the top university."

UBU Mobile Learning Project has the potential of offering programs that are academically more successful than similar programs offered at top universities that pre-select their students based on a high entrance GPA. It is possible to change C- GPA entrance students to C+ or B- or possibly a higher GPA upon students' graduation. For any institution with the strength and resolve to change from the traditional lecture-centred method; any students willing to make the effort to be responsible for their own learning, can excel academically and professionally. Without students taking responsibility for their own learning, improvement in their learning outcome will not occur.

The Ubon Ratchathani University Mobile Learning Project came about as a direct result of the 'Teaching *without* Lectures' project. This project encouraged instructors and university administrators to re-think their teaching and learning strategies.

Mobile Learning takes the university to the students, regardless of where they reside, making a university education not just accessible and convenient for all Thai's, especially for those living in the rural communities of Thailand, but also a teaching and learning environment that is academically and professionally more rewarding for both the student and their instructor.

References

Astin, A. (1985). Involvement: The cornerstone of excellence. <u>Change</u>, Volume 17, Number 4, pp.4-15. Bloom, B.S. (1956). Taxonomy of educational objectives: The classification of educational goals: Handbook I, Cognitive domain. New York, NY: Longmans, Green.

Duffy, T.M., & Cunningham, D.J. (1996). Constructivism: Implications for the design and delivery of instruction. In D. Jonassen (Ed.) Handbook of research for educational communications and technology. New York, NY: Macmillan.

Guskin. A. (1997) Learning More, spending less. From an essay that appeared in July-August 1997 issue of <u>About Campus</u>.

Jackson, B. and K. Anagnostopoulou (2001). "Making the Right Connections: Improving Quality in Online Learning." In J. Stephenson (ed.), <u>Teaching and Learning On-line</u>. London: Kogan Page Ltd., pp.53-67.

Leach, J., (2009). Dean of Admissions Santa Clara University's School of Law Interviewed in Top-Law-Schools.com. Available online at: http://www.top-law-schools.com/leach-interview

Organization for Economic Co-operation and Development (OECD) http://www.oecd.org

Richards, Inprasit, and Wattanataweekul (under review, Journal of University Teaching & Learning Practice, 2010).

Robert B. Barr, R. B. & Tagg, J. (1995). "From Teaching to Learning: A New Paradigm for Undergraduate Education," <u>Change: The Magazine of Higher Learning</u> Nov–Dec 1995 Volume 27, Number 6, pp.13–25.

Salter, D., Richards, L. & Carey, T. (2004) The 'T5' Design Model: An Instructional Model and Learning Environment to Support the Integration of Online and Campus-Based Courses. <u>Educational Media</u> <u>International</u>, Jan 2004 Volume 41, Number 3 pp.207-218

Sophakan, P. D4L+P (2008) program developer, Ubon Ratchathani University, Thailand Teasley, S. D., & Roschelle, J. (1993). Constructing a joint problem space: The computer as a tool for sharing knowledge.