



การประยุกต์ใช้การเรียนรู้แบบไฮบริดของ มหาวิทยาลัยหอการค้าไทยเพื่อสร้าง แนวคิดการเรียนรู้ให้แก่นักเรียนผู้พิการ และนักเรียนผู้มีศักยภาพสูง

Applying UTCC Hybrid Learning in the Designing of a Learning Framework for Students with Disabilities and High-Potential Students

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บทคัดย่อ

ปัจจุบัน สถาบันการศึกษาหลายแห่งได้มีการผสมผสานเทคโนโลยีการศึกษาผ่านสื่ออิเล็กทรอนิกส์เข้ากับระบบการศึกษาแบบเดิมมากขึ้นเรื่อย ๆ เพื่อตอบสนองความต้องการของนักเรียนที่เพิ่มขึ้นทั้งในด้านปริมาณเนื้อหาและความต้องการในการเตรียมความพร้อมเพื่อที่จะเผชิญความท้าทายในโลกสมัยใหม่ การศึกษาผ่านสื่ออิเล็กทรอนิกส์สามารถสร้างสภาพแวดล้อมการเรียนรู้ได้อย่างสมบูรณ์แบบที่จะช่วยเพิ่มประสิทธิภาพทางการศึกษาให้แก่แก่นักเรียนผู้พิการและนักเรียนผู้มีความสามารถสูง ทั้งสองกลุ่มโดย (1) ผสมผสานเทคโนโลยีสำหรับผู้พิการ เข้ากับเทคนิคการสอนที่เหมาะสม และ (2) ผสมผสานเทคนิคการสอนสำหรับนักเรียนผู้มีความสามารถสูง เข้ากับระบบการศึกษาผ่านสื่ออิเล็กทรอนิกส์ที่มีอยู่ทั่วไป ซึ่งนักเรียนเหล่านี้สามารถได้รับผลประโยชน์สูงสุดจากประสบการณ์การศึกษาผ่านสื่ออิเล็กทรอนิกส์เช่นเดียวกับนักเรียนทั่วไปได้ บทความนี้จึงมีวัตถุประสงค์ในการประยุกต์ใช้โครงสร้างการเรียนรู้แบบไฮบริดของมหาวิทยาลัยหอการค้าไทย เพื่อสร้างแนวคิดการเรียนรู้ให้แก่แก่นักเรียนผู้พิการและนักเรียนผู้มีความสามารถสูง โดยกล่าวถึงประโยชน์ของการศึกษาผ่านสื่ออิเล็กทรอนิกส์ อธิบายโครงสร้างรวมถึงการใช้งานของการเรียนรู้แบบไฮบริดของมหาวิทยาลัยหอการค้าไทย และเสนอแนวคิดการเรียนรู้ให้แก่แก่นักเรียนผู้พิการและนักเรียนผู้มีความสามารถสูง

คำสำคัญ: การศึกษาผ่านสื่ออิเล็กทรอนิกส์ การเรียนรู้แบบไฮบริด เทคโนโลยีเพื่อผู้พิการ เทคนิคการเรียน/การสอน นักเรียนผู้พิการ นักเรียนผู้มีความสามารถสูง

Abstract

Many educational institutions nowadays have increasingly integrated e-learning technologies into their educational system to better serve the needs of their students and to best prepare them for the challenges they face in the modern world. This is because e-learning can create and deliver a rich learning environment, which in turn enhances students' academic performance. By integrating appropriate adaptive technologies and suitable learning/teaching techniques with an ordinary e-learning program, students with disabilities and high-potential students, respectively, can also significantly benefit from an e-learning experience the same as other students. This paper aims at adapting UTCC Hybrid Learning infrastructure to design a learning framework for disabled and high-potential students. Accordingly, the authors discuss the benefits of e-learning, describe UTCC Hybrid Learning infrastructure and implementation, and put forward Hybrid Learning frameworks for both disabled and high-potential students.

Keywords: E-Learning, Hybrid Learning, Adaptive Technologies, Learning/Teaching Techniques, Disabled Students, High-Potential Students

Introduction

E-learning involves the delivery of an instruction or training program through electronic means such as computer or electronic media (Stockley, 2003). However, the way in which people use e-learning technology can be varied. For instance, an education program can be solely based on online learning in which students learn course materials, manage work projects, complete assignments and/or exams online without any face-to-face learning in classrooms. Another form of e-learning can involve the use of online education as a supplement to the traditional classroom learning. This method is known as blended learning.

As Adams (2010) points out, an interest in blended learning has certainly been growing as more people are seeking to find an appropriate balance for minimizing classroom overheads and maximizing course completion and test results. Accordingly, since 2008 University of the Thai Chamber of Commerce (UTCC) has implemented the blended learning strategy into its educational system, known as “Hybrid Learning.” However, an interest in e-learning has not just been a recent development at UTCC. Chokriensukchai (2005) once examined the benefits and disadvantages of e-learning and suggested an e-learning model for post-graduate level education in Thailand. Yet, in order to use e-learning in Thailand, higher

education institutions must have a suitable environment for e-learning (Chokriensukchai, 2004). Prawatvatchara (2005) studied the status of e-learning instruction and developed an appropriate e-learning system format for the instruction at UTCC. The author concluded that the format that is appropriate for the instruction at UTCC consists of three subsystems: an instructional system, an activity system, and an evaluation system.

With regard to the current UTCC Hybrid Learning system, it has proven successful so far. Annual surveys illustrate that this learning method has certainly helped improve students’ overall learning outcomes and satisfaction. For instance, the success rates for students achieving A and B are quite significant in HG002 English for Communication course. Between 2008-2010, 9% of students achieved A in 2008, 10% in 2009, and 18% in 2010. As with students achieving B, the percentage increased from 15% in 2008, to 22% in 2009, and finally 30% in 2010. Student satisfaction rates also significantly increased from about 4.0 percentage point in 2008 to 4.2 percentage point in 2010 in the same course. However, Hybrid Learning should not only be used with typical students. By combining UTCC Hybrid Learning infrastructure with appropriate adaptive technologies and techniques, students with disabilities and high-potential students, respectively, can also reap similar benefits from such educational experience.

The Benefits of E-Learning for Disabled and High-Potential Students: Literature Review

A) E-learning for Students with Disabilities

Mikolajewska and Mikolajewski (2011) examined e-learning opportunities for people with disabilities and put forward the many benefits as follows:

- home education, which is important for people with limited mobility;
- a flexible program: the time and place can be adapted to suit each student's situations;
- access to a wide range of multimedia sources, including images, movies, simulations, etc.;
- lower costs, because there is no need to commute to classes;
- integration with telemedical systems and health-care educational programs (e-health);
- useful training with e-work technology.

In addition to the benefits described above, e-learning can also help students with disabilities feel more independent, confident, and less stressed (Fichten et al., 2009). By having students with disabilities get familiarized with the use of computer and technology through e-learning, this would even help them with their future Careers. An investigation conducted

by Canadian council on Social Development in 2004 shows that computer use on the job is often associated with higher salaries for employees both with and without disabilities.

B) E-learning for High-Potential Students

Edwards (2009) defines high-potential of gifted learners as “those with exceptional abilities relative to most other people.” Silverman (2003) suggests that if a student demonstrates more than three-quarters of the following traits, it is likely that he or she is gifted:

- good problem solving/reasoning ability
- rapid learning ability
- intensity
- excellent memory
- long attention span
- personal and moral sensitivity
- compassion for others
- perfectionism
- unusual curiosity
- preference for older companions
- wide range of interests
- early or avid reading ability
- concerned with justice, fairness
- at times, judgment seems mature for age
- vivid imagination
- high degree of creativity and energy
- tends to question authority
- good with numbers and visual puzzles

The Education Program for Gifted Youth at Stanford University found that e-learning courses that they provide in a variety of subjects such as accelerated mathematics, university-level math and physics, and expository writing can provide great benefits to gifted students. These courses allow students to progress at their own pace and have individualized instruction that can accommodate individual differences in student learning. In addition, e-learning program can provide many advantages that high-potential students may not find in traditional classrooms. For instance, a study on e-learning experience of gifted students by Online Learning Partnerships found that while these students are often shunned in the classroom because they are too clever, an e-learning environment offers them a chance to share their ideas, knowledge, and works with others like themselves, and therefore is seen as a more ‘accepting’ environment for them.

Hybrid Learning at UTCC

The implementation of UTCC Hybrid Learning was, essentially, a realization of a new thinking in instructional methodology. UTCC Hybrid Learning education delivers background knowledge—the “what” aspect of the courses—such as facts and figures through web-based courses and online assessments. These online resources are integrated with traditional classroom education which focuses on the “why” and “how” aspects such as implications, applications, open questions and recent developments of the subject. The main objectives of this methodological change are to improve learning outcomes and to achieve student-centered education by increasing interactions between students and instructors, and amongst the students themselves (Dziuban, Hartman, and Moskal, 2004). Table 1 lists the elements of UTCC Hybrid Learning infrastructure.

Table 1 Infrastructure and Implementation of UTCC Hybrid Learning

Infrastructure	Implementation
Self-paced learning	<ul style="list-style-type: none"> • Offer online learning objects (Veronikas and Shaughnessy, 2004) such as web-based courses with Learning Management System (LMS), e-books, online assignments and reference materials. • Every student can work at his/her own pace to develop background knowledge and prepare for classroom activities.
Face-to-face learning	<ul style="list-style-type: none"> • Support face-to-face activities in the classroom with wireless internet access, computers, tablet PCs and a projector. • Class meetings focus mainly on the “why” and “how” aspects of the courses. • Encourage learning through asking questions, analyzing raw and secondary data, sharing ideas, discussing, and presenting findings and results.
Online collaborative support	<ul style="list-style-type: none"> • Facilitate group work and team projects using online collaboration tools delivered through Microsoft Live as a platform for collaboration. • An online document (e.g. MS Word, Excel, PowerPoint) can be edited simultaneously by students in a working group. • Facilitate group discussion via video conference. • Q&A online forum in which students can spontaneously communicate with professors.
Actively responding assessment	<ul style="list-style-type: none"> • An interactive electronic device, MyChoice Clicker (developed at UTCC), is distributed to each student to help effectively assessing his/her understanding of the materials discussed. • Engage students by applying MyChoice Clicker with a variety of best-practice assessment techniques (Angelo and Cross, 1993).
Electronic support system	<ul style="list-style-type: none"> • One Tablet PC/laptop is provided to each student for accessing web-based contents, e-books, and online assessments. • Students learn to analyze socio-economic statistical data using the web-based Survey Documentation and Analysis (SDA) tool available at the University of Chicago-UTCC research center.

Designing Hybrid Learning for Disabled Students

E-learning is one of the valuable tools that can help disabled people overcome their own educational and occupational limitation. However, e-learning for people with disabilities should be arranged for their specific needs. Such education programs should be addressed and easily adapted to the needs of a wide spectrum of people in terms of age, education

level, type and degree of impairment, and their capabilities for community participation (Mikolajewska and Mikolajewski, 2011). With the success of the Hybrid Learning system at UTCC, an e-learning program for students with disabilities can be designed by following UTCC Hybrid Learning infrastructure and incorporating it with the use of adaptive technologies suggested by Mikolajewska and Mikolajewski (2011) to serve the needs of disabled students as follows:

Table 2 Hybrid Learning Framework for Students with Disabilities

Disabled Students' Needs	UTCC Infrastructure
For people with cognitive impairments (depending on the type and severity): <ul style="list-style-type: none"> • simplified controls • simplified and enhanced on-screen information (i.e. with animation, help menus and content description) 	Objective: To help slow learners <ul style="list-style-type: none"> • Self-paced learning: provide online course materials so students can learn at their own pace without pressure from peers. • Face-to-face learning: provide class meetings for discussion and activities exclusively for slow learners. • Online collaborative support: access to a wide range of multimedia sources, including publications, images, movies, simulations and interactive exercises to increase thinking skill and run Q&A online forum so students can seek explanation on class materials from teachers at anytime. • Actively responding assessment: provide MyChoice Clicker to each student in order to effectively assess his/her understanding of the materials discussed and for all students to submit their input in class without being singled out.

Table 2 Hybrid Learning Framework for Students with Disabilities (continued)

Disabled Students' Needs	UTCC Infrastructure
<p>For people with motor impairments (depending on the type and severity):</p> <ul style="list-style-type: none"> • alternative keyboards and typing aids • on-screen keyboards • alternative mice, trackballs, joysticks and/or electronic pointing devices • sip and puff switches • voice control and speech recognition (e.g. Dragon) 	<ul style="list-style-type: none"> • Electronic support system: provide one tablet PC/laptop to each student so they can access web-based contents, e-books and online assessments at anytime they desire. <hr/> <p>Objective: To help individuals with limited mobility (i.e. impairments with hands and/or arms)</p> <ul style="list-style-type: none"> • Self-paced learning: access to online course materials so they can comfortably study at home. • Face-to-face learning: support face-to-face activities in classroom with internet access, computers, or tablet PCs and other assistive technologies specific to students with motor impairments. • Online collaborative support: facilitate group discussion among students and teachers via video conference. • Actively responding assessment: deploy a use of interactive devices that have touch screen in classrooms. • Electronic support system: provide tablet PCs/laptops to students so they can have access to e-books, e-magazines, etc.
<p>For people with hearing impairments:</p> <ul style="list-style-type: none"> • adaptive devices to support hearing • software for point-to-point video connections or videoconferences, for people using sign language or lip-reading • advanced multimodal (uses sounds, hand or body gestures to direct inter-human communication) Flash web sites with on-screen graphics, animation and text equivalents of the audio 	<p>Objective: To help individuals who have difficulty in hearing or are deaf</p> <ul style="list-style-type: none"> • Self-paced learning: access to online course materials to learn at their own pace. • Face-to-face learning: support face-to-face activities to share ideas and develop self-esteem focusing on using sign language or lip-reading. • Online collaborative support: facilitate group projects using online collaboration tools such as Microsoft Live as a platform for collaboration and online document such as MS Word, Excel, and PowerPoint.

Table 2 Hybrid Learning Framework for Students with Disabilities (continued)

Disabled Students' Needs	UTCC Infrastructure
<p>For people with vision impairments:</p> <ul style="list-style-type: none"> • screen enlargers • screen readers (e.g. JAWS, ReadPlease) • software that helps with writing (e.g. WYNN, TextHelp) • voice dictation software (e.g. Dragon) • advanced options for Flash web sites (e.g. synchronized narration) 	<ul style="list-style-type: none"> • Actively responding assessment: provide MyChoice Clicker and a hearing aid device to each student so every student can actively participate in classrooms. • Electronic support system: provide tablet PCs/laptops to students to promote efficient communication and learning between students and teachers and among students themselves. <hr/> <p>Objective: To help blind persons or those with low vision</p> <ul style="list-style-type: none"> • Self-paced learning: provide online course materials that contain bigger fonts that are easy to read and/or audio books for students. • Face-to-face learning: offer class meetings that mainly focus on the “why” and “how” aspects of the courses to further discussion among students. • Online collaborative support: facilitate group discussion and collaboration via video conference. • Actively responding assessment: incorporate the use of voice dictation software and/or software that helps with writing to help students with class assessments. • Electronic support system: install screen readers on tablet PCs/laptops to promote efficiency in accessing web-based contents for these students.

As Center for Assistive Technology and Environmental Access (CATEA) suggested other accommodations such as extended time in class discussion as well as classroom and online assessments, clear references and directions in text-based material, etc. should also be granted in all e-learning programs designed for students with disabilities. Most importantly, disabled students should not be enrolled with students without disabilities and should be grouped together with students of similar circumstances so they would not feel different or pressured from their peers. This would also make it easier for teachers to plan

and manage their teaching.

Designing Hybrid Learning for High-Potential Students

Like traditional classrooms, the most essential feature that an e-learning program should have is interesting and challenging learning materials as high-potential students have a more advanced rate of learning and higher thinking capacity than their peers. Therefore, UTCC Hybrid Learning infrastructure can be adjusted to accommodate high-potential students as follows:

Table 3 Hybrid Learning Framework for High-potential Students

UTCC Infrastructure	High-Potential Students' Needs
Self-paced learning	<ul style="list-style-type: none"> • In addition to regular online learning materials, teachers can incorporate quizzes/exams and/or allocate more assignments into web-based courses. • Online reading materials for high-potential students can be broadened to somewhat cover the “why” and “how” aspects of the course.
Face-to-face learning	<ul style="list-style-type: none"> • Class meetings should focus mainly on discussion to promote the sharing of knowledge and ideas among students. • Some discussion topics should allow for higher level thinking for high-potential students. • Teachers may form small group discussion in classroom to create vibrant learning environment and likelihood for every student to participate in classroom activity.

Table 3 Hybrid Learning Framework for High-potential Students (continued)

UTCC Infrastructure	High-Potential Students' Needs
Online collaborative support	<ul style="list-style-type: none"> • Facilitate group projects and group discussion using online collaboration tools via Microsoft Live or video conference outside of class time as to enhance students learning capability. • Use Q&A online forum as a place for high-potential students to exchange ideas and questions that they may not have an opportunity to share in regular class time.
Actively responding assessment	<ul style="list-style-type: none"> • Engage students by applying MyChoice Clicker with a variety of classroom assessments. • Teachers can include additional assessments that involve critical thinking and/or problem solving.
Electronic support system	<ul style="list-style-type: none"> • Provide tablet PCs/laptops to students so they can access web-based contents at anytime they desire. • Provide opportunity for high-potential students to learn and analyze socio-economic statistical data using web-based tool such as SDA available at UTCC. • Encourage high-potential students to further their knowledge about current research or studies by using online library as to improve their academic performance.

Furthermore, high-potential students can be matched with experts in their subjects. Such classes can also replicate certain components of advanced placement (AP) courses offered in many high schools and honors courses at many universities in the United States where students are required

to read advanced materials, complete more assignments and papers, etc. These AP and honors courses are normally not only geared towards high-potential students but also any student who is interested and has an outstanding academic performance. By implementing an e-learning curriculum that is

similar to AP and honors courses, this would not only help create an inclusive learning environment but also in all a better learning experience for high-potential students.

Conclusion and Future Works

Past studies certainly have shown that e-learning can provide many benefits to students of all types and is an important tool that can help them maximize their potentials and overcome their learning limitation. Particularly for students with disabilities, e-learning not only provides educational opportunity, but also means for psychological and social development for them as they tend to be shy and have low self-esteem. With the improvement in learning outcomes and satisfaction in Hybrid Learning of students at UTCC, we can use the existing infrastructure as a model to design an e-learning curriculum for students with disabilities and high-potential students. However, such courses for disabled students must also incorporate appropriate adaptive technologies in order to be effective and successful for them. As for high-potential students, an e-learning program must contain appropriate components to suit their exceptional learning capabilities and needs.

In order to develop an efficient e-learning program for any type of student, educational institutions must first identify the knowledge

of demand and the needs and expectations of their students, as these factors can determinedly influence the final performance and quality of the program. Such steps should be followed by primary and ongoing training, mentoring, and assessment of effectiveness as this is also critical to the overall success of online learning and teaching. In assessing the quality and effectiveness, further qualitative research should be conducted to gain in-depth information from real respondents and expand research results to quantitative research by conducting not only cross-sectional research but also longitudinal research in order to follow up the long-term impact of e-learning on academic performance and learning satisfaction of their students.

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References

- Adams, Jean. 2010. "A Four-Level Model for Integrating Work and E-Learning to Develop Soft Skills and Improve Job Performance." **IUP Journal of Soft Skills** 4, 4: 48-68.
- Angelo, Thomas A., and Cross, K. Patricia. 1993. **Classroom Assessment Techniques: A Handbook for College Teachers**. 2nd ed. San Francisco, CA: Jossey-Bass.
- Canadian Council on Social Development. **Disability Information Sheet No. 16, 2004: Workers with Disabilities and the Impact of Workplace Structures** [Online]. Available: <http://www.ccsd.ca/drip/research/drip16/drip16.pdf>
- Center for Assistive Technology and Environmental Access (CATEA). **Access E-Learning, Module 1: Accessibility Issues for Disabilities** [Online]. Available: http://www.accesslearning.net/mod1/1__01.php
- Chokriensukchai, Kanchana. 2004. "Thai Education in the Age of Electronics." **University of the Thai Chamber of Commerce Journal** 24, 3: 63-75. (in Thai).
- กาญจนา โชคเหรียญสุขชัย. 2547. "การศึกษายุคอิเล็กทรอนิกส์." **วารสารวิชาการ มหาวิทยาลัยหอการค้าไทย** 24, 3: 63-75.
- Chokriensukchai, Kanchana. 2005. "A Feasibility Study of Using E-Learning for Post-Graduate Studies." **University of the Thai Chamber of Commerce Journal** 25, 1: 95-107. (in Thai).
- กาญจนา โชคเหรียญสุขชัย. 2548. "การศึกษาความเป็นไปได้ในการนำระบบ E-learning มาปรับใช้ในระดับบัณฑิตศึกษา." **วารสารวิชาการ มหาวิทยาลัยหอการค้าไทย** 25, 1: 95-107.
- Dziuban, Charles D., Hartman, Joel L., and Moskal, Patsy D. 2004. "Blended Learning." **EDUCAUSE Center for Applied Research** 2004, 7 [On-line serial]. Available: <http://net.educause.edu/ir/library/pdf/erb0407.pdf>
- Education Program for Gifted Youth. 2010. **E-Learning Courses for Gifted and Talented Students** [Online]. Available: <http://epgy.stanford.edu/>
- Edwards, Kylee. 2009. "Misdiagnosis, the Recent Trend in Thinking About Gifted Children with ADHD." **APEX, The New Zealand Journal of Gifted Education** 15, 1: 29-44 [On-line serial]. Available: <http://www.giftedchildren.or.nz/apex>
- Fichten, Catherine S., et al. 2009. "Disabilities and E-learning Problems and Solutions: An Exploratory Study." **Educational Technology & Society** 12, 4: 241-256.
- Mikolajewska, Emilia, and Mikolajewski, Dariusz. 2011. "E-learning in the Education of People with Disabilities." **Adv Clin Exp Med** 20, 1: 103-109.

Milburn-Curtis, Coral. 2011. **Innovative E-Learning Approaches for Gifted Children** [Online]. Available: <http://www.olpoxford.org/entry.php/15-Innovative-elearning-approaches-for-gifted-children>

MyChoice Clicker [Online]. 2010. Available: <http://www.mychoice-clicker.com>

Prawatvatchara, Rattanaporn. 2005. **The Development of Appropriate E-Learning System Format for the Instruction at University of the Thai Chamber of Commerce (UTCC)**. Bangkok: Research Support Office, University of the Thai Chamber of Commerce. (in Thai).

รัตนภรณ์ ประวีตวิฑิตยารส. 2548. การพัฒนารูปแบบระบบ E-Learning ที่เหมาะสมสำหรับการเรียนการสอนของมหาวิทยาลัยหอการค้าไทย. กรุงเทพมหานคร: กองส่งเสริมงานวิจัย มหาวิทยาลัยหอการค้าไทย.

SDA: Survey Documentation and Analysis [Online]. 2012. Available: <http://sda.berkeley.edu/>

Silverman, Linda K. 2003. "Gifted Children With Learning Disabilities." In Nicholas Colangelo and Gary A. Davis (eds.), **Handbook of Gifted Education**, pp. 533-543. 2nd ed. Boston, MS: Allyn and Bacon.

Stockley, Derek. 2003. "Implementing E-Learning: A 'How To' Guide." **EI Magazine** 2, 7: 34-36.

Veronikas, Susan W., and Shaughnessy, Michael F. 2004. "Teaching and Learning in a Hybrid World: An Interview with Carol Twigg" **EDUCAUSE Review** 39, 4: 50-62 [Online serial] Available: <http://www.educause.edu/pub/er/erm04/erm0443.asp>



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