Abstract
This paper questions the viability of a stand-alone eLearning over the network (e-mode) independent from the classroom education (C-mode). The trade-off in effectiveness and efficiency between the two modes is discussed in the context of learning system for business management, in terms of content flexibility, time/location shift, delivery flexibility and human inspiration. A model of learner’s choice is developed for an optimal blend of the E-mode and C-mode based on the user (learner) characteristics and nature of the (learning) task.

Introduction: A model of E+C
E-learning may be defined as “any learning that utilizes a network (LAN, WAN or Internet) for delivery, interaction, or facilitation”\(^1\). This E-mode of education has attracted increasing interests of governments, companies, universities, schools and other education service providers all over the world\(^2\), as an alternative to the traditional mode of education delivered in the classroom (the C mode)\(^3\). Scores of eLearning platform and contents have been developed in the past years. However, the development of degree programs based on a stand alone e-mode fared below the original expectation\(^4\). This paper questions the viability of a stand alone e-mode for management education as a degree course at the graduate level. Based on the eLearning experience in the Master of Management programs in the College of Management Mahidol University (CMMU) Thailand, it studies the nature of management education and the needs of the learner, and provides insights on the trade off in the effectiveness and efficiency between the E-mode and C-mode. Instead of an E-mode independent from the C-mode, the paper argues for an intelligent blend of the E-mode and C-mode based on the user (learner) characteristics and nature of the (learning) task.

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\(^1\) Source: Assumption University website on e-learning at [http://www.elearning.au.edu/](http://www.elearning.au.edu/)


\(^3\) For example, Darby, J. 2004 reported the UK eUniversities established by UK government in 2001 had to be closed down in 2004, when it was concluded that “as a business, it was unlikely to become profitable in the time scale that had been allowed”
Learning in Business Management

Learning in the literature is defined as “a relatively permanent change in a behavioral potentiality that occurs as a result of reinforced practice” ⁵. The contents of learning in business management can be described in three levels as illustrated in figure 1.

In the concept formation stage of the learning process, the learner sorts his specific experiences into classes and general rules. Variables (the concepts about classes which can be measured in scales) are linked in models which state the hypothetical relationships between variables based on underlying rules. A model of “law of demand”, for example, states an inverse relationship between the one variable “price” and the other variable “quantity demanded”, ceteris paribus.

The solution repository to a business problem is built upon the knowledge on variables and models. It contains various decision variables (independent variables) with the expected outcome of dependent variables. The relationship between the two parts is described in a model on underlying rules. For example, a pricing decision can be made to provide solution for a higher sales value.

The outcome of the learning process, “change in a behavioral potentiality” is traceable in the level of knowledge, skill and state of mentality. Not only the learner should learn sufficient knowledge on variables, models and solutions introduced in the courses, they should also acquire the skills to form new concepts including new variables and new models, to prepare new solutions and to make choice among solutions in the repository. A more proactive mentality comparable to an ever changing environment should also be developed.

The actual “reinforced practice” of the learning process takes place with the interaction between contents, media, instructors and learners (see figure 2). In contrast to the traditional sequence where learners learn the contents first and then solve the problems to apply and reinforce what they have learnt, with the PBL (problem based learning) method, learners are exposed with a problem to be solved first and acquire the learning contents during the process of problem solving ⁶.

The learning system discussed above contains the learning contents, learning process and learning outcome as presented in figure 2. It is relevant to most disciplines in the management curricula, from theoretical foundations to applied management practice, as summarized in the scope of learning in table 1 ⁷.

<table>
<thead>
<tr>
<th>Branches of Knowledge</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical Foundation</td>
<td>Economics; Behavior science</td>
</tr>
<tr>
<td>Management tools</td>
<td>Decision skill, data analysis, accounting</td>
</tr>
<tr>
<td>Management Process</td>
<td>Principles of management; Strategic management</td>
</tr>
<tr>
<td>Special focus on main parts of value chain</td>
<td>R&amp;D, operation; marketing; sales</td>
</tr>
<tr>
<td>Special focus on stock/flow of enterprise resources</td>
<td>MIS, finance, human resource, logistic</td>
</tr>
<tr>
<td>Special focus on modes of business</td>
<td>Export, franchise, joint venture</td>
</tr>
<tr>
<td>Special focus on stages of business life cycle</td>
<td>New start up, M&amp;A</td>
</tr>
<tr>
<td>Special focus on scopes of business</td>
<td>SME management, International business</td>
</tr>
<tr>
<td>Special focus on environment for business</td>
<td>Law, industrial structure, culture</td>
</tr>
</tbody>
</table>

Table 1: Scope of Learning in Business Management Education

⁵ Hilgard & Bower 1981 and Ivergard, T. & Hunt, B. 2004
⁶ See Bridges & Hallinger 1995
As it is argued in the following sections of the paper, it is not necessary correct that the E-mode would have an advantage over the C-mode as we scrutinize the learning system for business management described above. An intelligent blend of the E-mode and C-mode should be configured with knowledge on the trade-off in the effectiveness and efficiency between the two modes.

Methodology

The observations in the following sections are based on the study of the eLearning experiences in the SCB Park campus of the College of Management, Mahidol University (CMMU) Thailand. CMMU SCB Park campus offers international master degree courses in six specialized areas, with an annual enrollment of around 700 students. Most of them are Thai and majority of them have working experiences.

The college has been implementing rigorous quality improvement in the past few years, driven by the student feedback, leading to a significant improvement of the average score in the student evaluation of courses. In terms of the course contents and delivery, application to real business situations and case study with local relevance is emphasized. Some courses also adopt the PBL method. A new course structure adopted recently also reduces class room teaching from 14 weeks to 12 weeks per trimester.

The eLearning system based on Claroline was established three years ago, together with organizational changes in the college. Claroline provides basic LMS functions such as group management, forums, document repositories, calendar, chat, assignment areas, links, and user profile administration.8

This study is conducted with the methodology of observation on the content, interaction and user statistics in the eLearning platform, as well as focus group of students, and in-depth interviews with instructors and IT administrators. In the focus group discussion, questions in three categories were asked: 1) what are the features of the eLearning (Caroline in CMMU) you have used and which one(s) do you like best? 2) What are the features you think should be added or improved? 3) What is your reaction if we move this part (list of name of subjects or specific learning task) of learning outside the class time and put it on eLearning?

The outcome of the study is the understanding of the trade-off in the effectiveness and efficiency when the learning is switched between the E-mode and the C-mode. A model describing the learner’s choice of the two modes is also developed, which can be tested quantitatively in the future study.

Trade-Off between E-Mode and C-Mode

For the sake of analytical simplicity, the E-mode in the analysis below refers a learning mode where the learning content is delivered and reinforced through the interactions over the network, independent from a physical classroom. The C-mode of learning refers a learning mode where the learning content is delivered and reinforced through the interactions in a physical classroom, independent form a network.

The trade-off in effectiveness and efficiency of the E-mode and C-mode is based on the advantages of the two modes as they are adopted in the learning system described above. The key advantages of each mode are extracted from an analysis of the

8 http://www.claroline.net. CMMU, Thammasat University and Prince of Songkla University in Thailand are among 422 organization users in 63 countries. See Appendix for CMMU and Claroline in details.
focus group and in-depth interview. They are summarized in table 2 below.

<table>
<thead>
<tr>
<th>The advantage of the E mode</th>
<th>The advantage of the C mode</th>
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<tr>
<td>Content flexibility</td>
<td>Delivery flexibility</td>
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<tr>
<td>Time/location shift</td>
<td>Human Inspiration</td>
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Table 2: Advantages of the E-mode and C-mode

Content flexibility is achieved through the “richness” of the content. It refers to the capability of the E-mode to deposit a vast amount of learning materials (from plain text to multimedia) in the network which can be easily retrieved according to the information requirement of the learners. The learning materials in the repositories could either convey a concept to be learnt or serve as a tool to explain or reinforce a concept. Efficiency is achieved in terms of resource sharing over the network.

The Content flexibility also leads to a related advantage of transparency, a repository of learning materials visible in various degrees to stakeholders of the education system: manager, administrator, instructor, students, funding party, and future employer.

The advantage of content flexibility is the most noticeable advantage discussed in the eLearning literature. User statistics in CMMU also showed “documents repositories” is the most popular features of the eLearning for both students and instructors.

Time/location shift possibility refers to the “reach” of the learning content. It is the capability of the E-mode to reach a vast number of learners through the network according to learner’s preference of time or location of learning. The advantage of time/location shift is also reasonably exploited in CMMU as revealed by user statistics on the time of access beyond the class time.

However, one insight obtained from this study is that one should not equate the “rich and reach” advantage of the E-Mode to the “delivery flexibility” where the C-mode is perhaps more effective and efficient.

Delivery flexibility refers to the capability of the C-mode to present and reinforce the learning contents adaptively according to the cognitive ability, habit of learning, pre-course experience and environmental context of the learner. It is different from the content flexibility (rich) which serves different information requirements. It is also different from the time/location shift possibility (reach) which caters for different time and location preference of the learner. It addresses the issues about how a learner learns instead of what, where and when.

The delivery flexibility is called for due to the diversity of the backgrounds of the learners in business management at graduate level. It is not uncommon to have a batch of students from different industries, and with different under graduate training. These differences inevitably lead to different level of cognitive ability (the ability to generalize, abstract, infer, interpret, explain, apply and create), and different learning habit (from simple conditioning, to understanding followed by perceiving and doing, or adaptive structuring and reformulating).9

A delivery adapted according to the cognitive ability, habit of learning, pre-course experience and environmental context of the learner would not only improve the efficiency in acquiring a concept by the learner, but also improve the chance of the learner to apply a concept later with right skill and mentality.

To outperform the “delivery flexibility” of the C-mode where an experienced teacher in a class of proper size for sufficient

9These learning habits correspond to the three major schools in the literature on learning process: the conditioning and behaviorist theories, cognitive theories and structural theories.
The E-mode must build two important mechanisms: The first one is a “probing” mechanism to understand the cognitive ability, habit of learning, pre-course experience and environmental context of the learner; The second is a sufficient large “repository of pedagogy” in responding to the learner backgrounds. It is questionable if it is technologically feasible or at least efficient to build and execute these mechanisms in a timely manner, given the complexity of learner’s background and the ever changing contents and environmental context of the business management at graduate level.

“Human Inspiration” refers to the stimulation learners receive from the physical presence of the instructor and fellow learners, especially when the learning task requires certain degrees of creativity. It may also include a sense of discipline imposed on the learner when a face to face contact with the instructor and fellow students is presented. It is by definition not be transmitted overt the network, independent from the human presence. One may argue for the special relevance of human inspiration in business management because of the emphasis of the learning contents on empathy.

The above analysis on the advantage (disadvantage) of the E-mode and C-mode leads to the suggestions of a blend of the two modes. Due to the limitation on human and financial resources of the education institution, and the time and efforts available to a learner, a choice may have to be made on deploying which type of contents on either E-mode or C-mode. A choice model is presented in the next section which explains the learner’s choice in terms of user (learner) characteristics and nature of the (learning) task.

10 In the case of CMMU, the maximum size of a class is 25, and most students experienced and enjoyed the interaction in the classroom among themselves and with the instructors.

Learner’s Choice Model

A learner’s choice model is derived based on the insight gained from focus group interview described above. The dependent variable is the learner’s preference to learn a subject in E-mode or C-mode, defined above for the sake of analytical simplicity. It is explained by the two independent variables: task nature and user characteristics (figure 3).

The task nature has two sub-variables which described the learner’s expectation the content flexibility and delivery flexibility required for the success in the learning task. As defined above, the content flexibility is about “what” a learner learns and this sub-variable may be operationalized as the learner’s expectation on the depth and breadth of the information to be acquired. As discussed above, it is expected to have a positive relationship with the probability of the learner’s choice for the E-mode.

The delivery flexibility is about “how” a learner learns and this sub-variable may be operationalized as the learner’s expectation on the complexity of the learning task, which is determined by the respective cognitive ability required, learning habit desired, transferability of the pre-course experience and relevance to the learner’s environmental context. As discussed above, it is expected to have a negative relationship with the probability of the learner’s choice for the E-mode.

The user characteristic has four sub-variables: The requirement of time/location shift is expected to have a positive relationship with the probability of the learner’s choice for the E-mode. The IT readiness is operationalized as the physical access to a broad band network as well as previous usage of Internet. It is also expected to have a positive relationship with the probability of the learner’s choice for the E-mode.
The sub-variable *gregarious propensity* describes a learner’s preference to be in a group with face to face contact. The sub-variable *pre course motivation* describes if the learner is sufficiently motivated to study the subject. Like gregarious propensity, the sub variable pre course motivation is expected to have a negative relationship with the probability of the learner’s choice for the E-mode. It is assumed that a less motivated learner would prefer more inspiration and discipline from the face to face interaction with the instructor and fellow students in the C-mode.

The model described above can be expressed in the following equations of logistic regression, where \( p \) is the probability of a learner to choose an E-mode instead of C-mode for a learning task, \( p/(1-p) \) is the “odds ratio” for such a choice, \( X \) (i=1 to 6) represents the 6 sub variables described above, \( \alpha \) and \( \beta \) are coefficients to be estimated and \( \varepsilon \) is the error term.

\[
\ln \left( \frac{p}{1-p} \right) = \alpha + \beta X_i + \varepsilon
\]

The logistic regression model above can be tested quantitatively in the future study. The empirical insight on the factors influencing the learner’s choice on the E-mode and C-mode may help the education institution to develop an optimal combination of E-mode and C-mode for a set of learning tasks. Such combination can be modified to cater for different learning task and student segment based on the user (learner) characteristics and nature of the (learning) task.

**References**


Bridges & Hallinger, *Implementing Problem Based Learning*, University of Oregon, ERIC (1995)


Figure 1: Contents of Learning in Business Management

Figure 2: Learning System in Business Management

Figure 3: Learner’s Choice Model
Appendix: Claroline 1.6 in CMMU

CMMU is currently using “Claroline” 1.6 as an eLearning platform. Claroline is an Open source Software under Gnu Public License (GPL). It works on most web servers such as Apache and Microsoft IIS and requires PHP engine and MySQL database server.

Claroline provides various tools for teaching such as course description, agenda, announcements, document and links, exercises, learning path, assignments, forums, groups, users, chat and supports SCORM 1.2 (see figure below). It also generates access statistic for administrator or teacher. For example, a teacher can monitor the number of students accessing each tool. The scope of data collected may be controlled with customized query.

Basically, there are three types of user rights in Claroline: administrator, teacher, and student. An administrator is able to access every course. A teacher may act as course manager to create contents and manager user in the course he teaches, or as a group tutor to control forum, documents and chat for the group supervised. A student may follow the course he registered, contribute to the forum and share documents within his group.

Recent user statistics shows there are around 70 active courses on Claroline in CMMU. “Document and links” is the most popular feature, while a few courses have exploited other capabilities of Claroline, for example, on-line interactive testing, on-line collaboration of group project, monitoring the progress with learning path, and web-casting of the group presentation.

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