WEB-ENHANCED LEARNING IN MEDICAL CLERKSHIP

Carl Froilan D. Leochico, PTRP, and John Anthony A. Domantay, MD, FPSP, PhD

Abstract

Introduction: With the advent of modern technology, different schools, including medical schools in the Philippines, are shifting towards the use of technological advancements as part of their academic curricula. Before significant steps can be initiated towards the design and implementation of an e-learning medical website, it is imperative to assess the readiness and acceptance of various stakeholders regarding the innovative concept. Methods: A cross-sectional study design was used. Questionnaires were administered to fourth year medical students of SLU-COM, various medical educators in affiliated training hospitals, and the College Dean. Data analyses (t-test, f-test, chi-square test) were done using MS Office Excel 2003, with level of significance set at 0.05. Results: Instrument was reliable with a Cronbach’s coefficient alpha of 0.85. Only 53 clinical clerks were obtained as respondents. Majority of them were females (70%) and had an average household monthly income (53%), but all had an access to computer (100%). An average of 47 clerks (89%) answered “yes” (implying access) to all items in the Resources part. There was no significant difference in the access to resources among the fifteen different items ($x^2 = 5.418$). Out of 4, respondents had the following means: skill of 3.47, accepted teaching-learning techniques of 3.12, and preferred medical website contents of 3.30. Generally, significant differences were found between males and females in all aspects, except for resources. Conclusion: The clinical clerks were very ready for e-learning based on high level of resources and skills, and showed moderate level of acceptance for e-learning as a teaching-learning approach

Keywords: e-learning, web-enhanced learning

Introduction

In preparation of its students for entry into actual practice of the field, the medical school provides a suitable environment, where one can develop a strong, working foundation of current medical knowledge, skills, and attitudes. The training a medical student undergoes is long and tedious before he can be awarded the prestigious title of “Doctor of Medicine (M.D.).” After earning a bachelor’s degree in arts or sciences that takes about four to five years, depending on the pre-medical course, the physician-to-be takes his first step in the medical school, which entails another three years of intensive classroom-based lectures, and one year of rigorous hospital- and community-based training (clerkship). Following graduation, he continues his medical education as a post-graduate intern as a prerequisite in taking the Physician Licensure Examinations, the benchmark of the beginning of his medical career. He wants to be trained with the most effective and latest instructional strategies so that he can pave his way towards his goal of becoming a competent and holistic doctor, competitive locally and globally. It is in this light that medicine students should be given the utmost assistance to guide them in their journey.

Medical schools across the world have taken advantage of educational technology, such as custom-designed course websites. In 2000, a group of European medical universities...
E-International Scientific Research Journal  
ISSN: 2094-1749 Volume: 2 Issue: 4, 2010  

collaborated in designing a pilot project, entitled “Tuning educational structures in Europe,” which intended to adopt Virtual Learning Environment (VLE) and Managed Learning Environment (MLE) as teaching-learning strategies to cater to the students of the current generation (WHO-WFME, 2005).

Furthermore, in Southeast Asia, there are currently 261 recognized medical schools that provide education parallel to developed countries by using the latest technology on their way to growth, change, and development. Indeed, universities and other institutions of higher education are increasingly turning to e-learning, as a vehicle for quality assurance. Fortunately, after grueling efforts and critical decisions, all accredited medical schools said that they “have benefited from quality assurance measures and standards, and in consequence produced physicians of better quality” (WHO-WFME, 2005).

E-learning, also known as evolving, enhanced, or extended learning, which is the use of multi-channeled technology in learning opportunities (Logan, n.d.), has long penetrated the culture of the Philippines, particularly in the field of education. Now in a climate of borderless teaching and learning, many schools have taken on the challenge of integrating e-learning into their curricula in response to “continual developments in information and communication technology, a shift in learner expectation, changing demographics of learners, and rapid development of subject knowledge…” (Engelbrecht, 2003). For instance, through UST’s Blackboard Learning System, called “e-leap,” and SLU’s Learning Management System, called “mySLU,” universities are gradually bringing e-learning into the mainstream of their educational programs.

However, “there is no point in using new technology unless it generates more productive learning experiences for students” (McKeachie, 1999). Moreover, in order to avoid waste of efforts, time, and money, it is imperative to highlight “the importance of mental readiness, right attitude, and appropriate training on computing knowledge and skills of students before implementing the integration of technology in any educational system” (Bahari and Hamed, 2009). Moreover, teachers know very well that motivation and interest are integral factors that influence the way information is used and critically evaluated by the students. Hence, the preferred design of the course, comfort with online technologies, skills, and motivation of the learner are all essential in creating a successful online learning environment (Song et al., 2004; Santhanam and Leach, 2000).

The aim of the study, therefore, was to determine the level of readiness for, and level of acceptance of web-enhanced learning among clinical clerks and their medical educators. Specifically, the present study wants to answer the following questions:

1. What is the level of readiness for e-learning based on access to resources among the following respondent groups, namely: (a) clerks, (b) senior resident physicians, training officers, and department heads, and (c) Dean of SLU College of Medicine (SLU-COM)?

2. Are there significant differences in the level of readiness for e-learning based on access to resources among the respondent groups in terms of the following: (a) gender, (b) socio-economic status, (c) respondent groups, (d) computer ownership, and (e) field of specialization (only for medical educators)?

3. What is the level of readiness for e-learning based on the presence of technical skills among the aforementioned respondent groups?

4. Are there significant differences in the level of readiness for e-learning based on the presence of technical skills among the respondent groups in terms of the following: (a) gender, (b) socio-economic status, (c) respondent groups, (d) computer ownership, and (e) field of specialization (only for medical educators)?
5. What is the level of acceptance of e-learning based on preferred teaching-learning techniques among the respondent groups?

6. Are there significant differences in the level of acceptance of e-learning based on preferred teaching-learning techniques among the respondent groups in terms of the following: (a) gender, (b) socio-economic status, (c) respondent groups, (d) computer ownership, and (e) field of specialization (only for medical educators)?

7. What are the most preferred contents of a customized e-learning medical website according to the different respondent groups?

8. Are there significant differences in the preferred customized e-learning medical website contents among the respondent groups in terms of the following: (a) gender, (b) socio-economic status, (c) respondent groups, (d) computer ownership, and (e) field of specialization (only for medical educators)?

Methods

A cross-sectional study was conducted on all regular fourth year medical students enrolled in SLU-COM during the school year 2009 to 2010, as well as their medical educators (senior resident physicians, training officers, and department heads of affiliated hospitals, and the College Dean).

The questionnaire, entitled “E-learning Readiness and Acceptance Evaluation,” was formulated through various readings on related literature. It consisted of two major parts. The first part was meant to obtain demographic data. The second part consisted of three Constructs, namely, Resources, Skills, and Preferences.

The face and content validity of the research instrument was established after scrutiny and critique by the Dean of the College of Medicine. A pre-test was conducted to establish reliability of the questionnaire using Cronbach’s coefficient alpha. Data analyses were done using Microsoft Office Excel 2003. The level of significance was set at 0.05.

Treatment of Data

With a variety of data types per Construct, different evaluation schemes were designed, as modified from related studies.

Construct 1: Resources. In order to establish the level of access to technology of the general population, the total count of “yes” per item on resources was obtained, and summed up. Thereafter, the level of readiness was evaluated using the grouped frequency distribution:

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Level of Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 – 15</td>
<td>Very Ready</td>
</tr>
<tr>
<td>8 – 11</td>
<td>Moderately Ready</td>
</tr>
<tr>
<td>4 – 7</td>
<td>Slightly Ready</td>
</tr>
<tr>
<td>0 – 3</td>
<td>Not Ready</td>
</tr>
</tbody>
</table>

Chi-square test was done to determine the relationship among different Resources items, and among variables (e.g., gender, and income) in terms of over-all access to resources.

Construct 2: Skills. General computer technical skills were assessed based on the following levels, patterned after a study done by Mercado (2009): 4 – Very Good Skills, 3 – Good Skills, 2 – Poor Skills, and 1 – No Skills. Each level of skills reflected a corresponding level of readiness.

Construct 3: Preferences. The preferred teaching-learning techniques and perceived possible contents of a customized e-learning medical website were obtained. The levels of preference were described in the following manner: 4 – Very Much Preferred, 3 – Preferred, 2 – Slightly Preferred, and 1 – Not Preferred. The levels of acceptance of e-learning were reflected solely by their corresponding levels of teaching-learning technique preferences.
Preferences for various contents of an e-learning medical website only determined the predilection of the respondents, and were not used to determine the level of acceptance of e-learning approach in particular.

The arithmetic weighted means for all Constructs were computed for qualitative interpretation, as reflected in Table 1.

**Significant Differences among Variables.** The levels of readiness and acceptance, and the preferences for possible website contents varied according to socio-economic status, respondent groups, and field of specialization, which were treated using one-way analysis of variance (ANOVA). Meanwhile, significant differences in gender and computer ownership were analyzed using t-test for independent samples, except in the Resources construct, wherein \( x^2 \) was obtained.

### Results and Discussion

A pre-test, which involved irregular clinical clerks (10), was done to establish instrument reliability, which yielded a Cronbach’s coefficient alpha of 0.85, which was deemed reliable since it was greater than 0.70. For the actual study, among the target respondents, only the clinical clerks were able to return accomplished questionnaires. Other target respondent groups (medical educators) were not able to return any questionnaire owing to their busy schedule and varied priorities; such was one of the limitations of the study.

The demographic characteristics of the study population were summarized in Table 2. Since the respondents were all clerks, the variables field of specialization and respondent group were not anymore considered as confounding variables. Having average household monthly income, the respondents generally were at least in the middle class of the society; hence, all students had an easy access to computers, whether personal (owned) or shared, especially when the need arises in school or hospital.

**Level of E-learning Readiness in terms of Resources.** It was established using chi-square (one-way) that there were no significant differences in the access to resources among all items in the Resources Construct (computed \( x^2 5.418 > \text{critical value 23.685} \)), as presented in Table 3A. After counting all “yes” per Resource question, and summing them up for a total of 15 items, an average of 13.15 was obtained and given an equivalent level of readiness as “very ready” according to the established grouped frequency distribution (please refer to Methods). Therefore, it was justified to follow the grouped frequency distribution method to establish the level of readiness since all items did not vary significantly as to the presence of access among respondents. This means that the resources asked in the Resources construct were homogenous, implying each item was generalizable or indeed related to all other items in the Construct. Nonetheless, it was discovered that while majority had adequate materials (e.g., fast processor, functioning hardware, and up-to-date software) needed for an e-learning environment, there are still 13 (~25%) out of 53 students who usually get disconnected when accessing the internet, which must be probed further and addressed in the future (Tables 3B and 3C).

There were no found significant differences between gender and the access to resources (Table 3B). Similarly, an above average, average, or below average household monthly income did not vary in terms of access to resources (Table 3C), implying that their access to resources was neither restricted nor furthered by their economic status; all had equal footing. Hence, as an over-all implication, an environmental scanning of resources was accomplished by the present study, wherein the survey revealed that the clerks had general access to general computer hardware and software, and the internet, which are all prerequisites in considering e-learning as a teaching-learning method. Therefore, based solely on access to resources, they were very ready for an e-learning environment.
**Level of E-learning Readiness in terms of Skills.** Table 4A showed that the clerks generally had very good skills (VGS) in terms of general computer technical proficiency, with an equivalent level of readiness of “very ready” (Table 1). The clerks were highly skilled in operating the software and hardware of the computer, and in generally finding their way around the World Wide Web. However, skills have yet to be developed in applying course materials, and in managing their time to accommodate e-learning into their schedule (Table 4A).

Significant differences were found between males and females in terms of skills. Generally, males were more skilled than females (Table 4B), owing to the technical and manual inclination more favored by and suited for males than females, who were less “tech-y.” However, there were no significant differences among the three levels of household monthly income (Table 4C), implying that skills were not dependent on their economic status.

**Level of E-learning Acceptance in terms of Preference for Modern Teaching-Learning Techniques.** The clinical clerks preferred only to a moderate degree the modern teaching-learning techniques as part of clerkship, as reflected by a mean of 3.12 out of 4 (Table 5A). Hence, they have only moderately accepted e-learning as a future innovation in the curriculum (Table 1). Further studies should be done to assess the reasons behind such occurrence. Nevertheless, highest mean preference was found in applying common internet applications to assist in the learning process; thus respondents generally favored the use of technology as part of their school life. However, the results showed that a majority still favored traditional methods (e.g., listening to a lecture) over modern ones (e.g., surfing the net to understand and retain information), which must further be expanded and explained in the future.

Similar to skills, significant differences were found between genders, but not among income levels. Males had higher preference for modern techniques of learning than females, who were less “gadget-y” and “tech-y” (Table 5B). This predisposition was definitely not affected by economic status (Table 5C).

**Preference for Various Medical Website Contents.** In general, the respondents asserted very high preference for the website contents listed on the questionnaire. They found relatively greater preferences for having download/upload options, and online reviewers and exams than having videoconferences and online advertisements (Table 6A). These preferences were significantly varied between genders possibly for the similar aforementioned reasons, but were not affected by varied economic status (Tables 6B and 6C).

**Conclusion and Recommendations**

In the present world of modern technology, various electronic innovations have enormously increased one’s ability to progress in his field or profession. Relevantly, these advancements have also established their place in contemporary educational practice. They continue to become an integral part of the teaching and learning process, and serve as “engines of change” in classrooms and schools (Norton, 2003). Change towards human and societal development is an essential purpose of integrating technology into the educational system. The use of these modern tools, such as e-learning, must indeed serve as man’s instrument for attaining a higher quality of education.

In anticipation of an e-learning initiative in SLU College of Medicine, the present study established that the clinical clerks were very ready for such endeavor, as reflected by their high level of access to computer and internet-related resources, and high level of technical skills. However, the research has not probed into reasons behind the moderate acceptance of clerks towards e-learning as a teaching-learning technique. In the occasion that planning for e-learning has begun, the various contents that the clerks had very much preferred in this study...
could be considered in designing and customizing a medical website suited for the future clerks of the College.

Lastly, in the light of the limitations of the study (e.g., time constraints, lack of questionnaire returns, and lack of other respondent groups), it was highly recommended that similar researches be done to involve a large population so conclusions can be generalizable and more valid, such that medical educators could also be surveyed and considered. Moreover, learning styles and multiple intelligences could be added as confounding variables. It could also be interesting to correlate the state of access to resources and the respondents’ level of skills. All these could be most helpful during the significant first steps towards integrating an e-learning environment to improve the clerkship curriculum and academic performance of students in Saint Louis University - College of Medicine.

References


