

SWOT-Based Learning Management System Performance Analysis in FEU Institute of Technology

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Abstract- The application of technology has dramatically changed the delivery of education. E-learning is the integration of technology in education that covers a variety of activities to support the teaching and learning practice. This paper examines the Learning Management System issues related to the implementation of the E-learning facility in FEU Institute of Technology. The researchers conducted SWOT analysis based on the response of faculty and students through questionnaire. The result of the responses is analyzed to measure the effectiveness of the e-learning facility by being able to trace the strengths, and to find new opportunities in implementing the e-learning facility in FEU Institute of Technology, which will contribute to the improvement of teaching and learning practice. This paper also includes the tools awareness survey to identify web technologies that can be used as e-learning tools in higher education.

Keywords—e-learning, learning management system, swot analysis, analytics, performance, assessment, technology, webapplication

INTRODUCTION

Technology is rapidly changing that can be seen as supporting modernization, economic growth and lifestyle improvement. The application of technology has dramatically changed business organizations and the delivery of education. Online-learning appears to be a classic disruptive innovation with the potential not just to improve the current model of education delivery, but to transform it (Staker, 2011). This integration of technology in education is called e-learning. JISC (2014) defined e-learning as learning facilitated and supported through the use of information and communications technology. It can cover a spectrum of activities from use of technology to support learning as part of a blended approach (a combination of traditional and e-learning approaches), to learning that is delivered entirely online.

The implementation of e-learning can be an additional avenue and medium for knowledge exchange that supports teaching and learning practice. There are related critical factors to assess the readiness of higher educational institution in implementing e-learning such as technological bandwidth, which is considered as one of the barriers. Suhail (2014) found out that low internet speed, inadequate telecommunication infrastructure, high cost of bandwidth, non-existent or inadequate bandwidth management policies and accessibility were the technological related challenges faced by the organizations seeking to implement e-learning solutions in their systems. Therefore, information technology resources must be provided adequately to academic staff and students to aid the demands of developing online resources available and accessible on and off campus. Furthermore, strategic planning and implementation must be made by managers to drive e-learning to the mainstream of educational practice. However, any strategy that gives technology an independent role as problem solver is doomed to fail (Lundvall, 2004). From an educational view point, Collis (1996) states that it is not technology but instructional implementation of the technology that determines the defects on learning.

The pedagogical and socio-economic forces that have driven the higher learning institutions to adopt and incorporate ICTs in teaching and learning include greater information access; greater communication; synchronous and asynchronous learning; increased cooperation and collaboration, cost-effectiveness and pedagogical improvement. However, ICTs have not permeated to a great extent in many higher learning institutions in most developing countries due to many socio-economic and technological circumstances (Sife et al, 2007). Clearly, though, for technology-enhanced assessment to be effective, pedagogically sound developments need to be supported by robust and appropriate technology, within a supportive institutional or departmental context (Gray, 2014).

This paper aims to conduct SWOT analysis to measure the effectiveness of the e-learning facility of FEU Institute of Technology that will help the institution analyze the needs for their e-learning initiatives, and in turn will be instrumental in developing their e-learning strategies. Through this comprehensive implementation assessment process, the institution can establish its e-learning goals. This paper also includes the tools awareness survey to identify web technologies that can be used as e-learning tools in higher education.

Statement of the problem

The study sought to answer to the following questions:

1. What is the descriptive analytics of the assessment of the e-learning facility of FEU Institute of Technology as perceived by faculty and students?
2. What are the strengths and weaknesses of the implemented e-learning facility of FEU Institute of Technology?
3. What opportunities and threats can be drawn from the assessment of the e-learning faculty?
4. What web technologies can be used as e-learning tools in higher education?
5. How effective is the implementation of e-learning based from faculty and students' assessment?
6. What recommendations may be drawn from the findings of the study?

Objectives of the Study

1. To describe the assessment of the e-learning facility of FEU Institute of Technology as perceived by faculty and students
2. To determine the strengths and weaknesses of the implemented e-learning facility of FEU Institute of Technology
3. To find out opportunities and possible threats which can be drawn from the assessment of the e-learning facility
4. To identify web technologies that can be used as e-learning tools in higher education
5. To determine how effective the implementation of e-learning based from faculty and students' assessment
6. To formulate recommendations on the e-learning implementation

Scope and Limitations of the Study

The e-learning facility currently used by FEU institute of technology has been assessed using SWOT-based analysis. The SWOT-based consists of the strength, weakness, opportunities and threats. The respondents were divided into two groups namely faculty and students from the Information Technology Education Department. The sets of questions were provided as an assessment tool to determine e-learning effectiveness.

SPSS (Statistical Package for the Social Sciences) statistical package was used to analyze the data and describe the results of the e-learning assessments. The research was delimited to e-learning users within the two years of e-learning implementation.

1.4 Significance of the Study

The findings of this study is expected to be of great value to the following groups:

FEU Institute of Technology Administrators. The study could serve as basis for defining and maintaining quality control standards for implementing the e-learning facility.

Faculty researchers. This study will serve as reference and guide to other faculty members who will undertake parallel research study.

Methodology

This chapter presents the research design, specifically, the method and techniques, the respondents of the study, the instrument of the study, and the data processing and statistical treatment that will be applied in the study.

Methods and Techniques Used

The study will make use of the descriptive analysis. Descriptive analysis attempts to describe, explain and interpret conditions of the present i.e. "what is". The purpose of a descriptive analysis is to examine a phenomenon that is occurring at a specific place(s) and time. This method will be used to determine the frequency of the indicators provided by the researchers.

In this study, FEU Institute of Technology e-learning facility will be assessed through a set of questionnaires. The questionnaires were drawn from the paper of Raga et al (2014). Documentary analysis will be used extensively in gathering data and information from sets of respondents which include faculty and students.

Population and Sample of the Study

The study will be using purposive sampling technique. Purposive sampling is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research. Some types of research design necessitate researchers taking a decision about the individual participants who would be most likely to contribute appropriate data, both in terms of relevance and depth.

The respondents of the study consists of 5 faculty members and 77 students who used the e-learning facility in two years of its implementation.

Data Processing and Statistical Treatment

The data to be analyzed came from sets of answers in the lists of indicators in the questionnaire provided. SPSS that will be used in the study will make every effort to make the software easy to use. This prevents the researcher for making mistakes or even forgetting something. It begins by defining a set of variables and enters the data for the variable to create member of cases. After the data is entered into SPSS, the cases will be all defined by value stored in the variables. The following statistical tools will be utilized in reporting the findings of the study.

Mean. As defined by Barnes (2000), the mean is the most common measurement of average. It is the point which balances all values on either side. It is preferred as the measure of central tendency when the distribution is symmetrical. When the mean is computed from a grouped data, the accuracy of the result may be affected by the loss of the true identity of the original numbers.

Percentage. To find out what part of the population was represented out of one hundred equal parts, the percentage method is used.

To measure the level of assessments of students and faculty to e-learning facility, likert scale was used

Table 1 *Likert scale*

Range	Interpretation
4.51 – 5.00	Strongly Agree
3.51 – 4.50	Agree
2.51 – 3.50	Neutral
1.51 – 2.50	Disagree
1.00 – 1.50	Strongly Disagree

Results and Discussion

1. The descriptive analytics of the assessment of the e-learning facility of FEU Institute of Technology as perceived by faculty and students.

Table 2 *Students' perception in e-learning*

Indicators	Mean	Interpretation
1. The e-learning system in your institution helps to support and improve communication between faculty and students.	3.77	Agree
2. The e-learning system in your institution helps to minimize the academic workload of faculty.	3.95	Agree
3. The e-learning system in your institution helps to enhance the knowledge and understanding that students gain from lectures, tutorials, and practicals.	3.77	Agree
4. The e-learning system in your institution helps to make administering tests and quizzes easier for the faculty and students.	4.00	Agree
5. The e-learning system in your institution enables students to learn at a place and time of their choosing.	3.83	Agree
6. The e-learning system allows the faculty to track the performance of students and provides students with the ability to track their own performance.	3.73	Agree
7. The faculty spend sufficient amount of time in supporting the students' exploration of topics posted in the e-learning system.	3.49	Neutral
8. The students are sufficiently motivated in using the e-learning system.	3.42	Neutral
9. The e-learning system can only be utilized by qualified faculty.	3.62	Agree
10. The IT setup and network connectivity is sufficient to provide every faculty and student easy access to the e-learning system.	3.47	Neutral
11. The e-learning system can only be utilized by technology-savvy students.	3.36	Neutral

12. The e-learning system enables students to access educational materials in a variety of learning elements and media format (e.g., HTML content, videos, audio recordings, text files, presentations, FAQs, etc).	3.57	Agree
13. The e-learning system makes it easier for faculty to track the-learning progress of individual students.	3.56	Agree
14. The e-learning system helps to provide students with opportunities to exchange ideas with each other and even learn from their mistakes and experiences.	3.48	Neutral
15. The materials provided in the e-learning system provides students the opportunity to study part-time and make-up for lost lessons in case they incur absences in classroom sessions.	3.66	Agree
16. The e-learning system enables students to cover more-learning materials per course.	3.73	Agree
17. Sufficient measures have been taken to prevent students from hacking the course materials or cheating by sharing assignments and online tests answers.	3.62	Agree
18. Students learn much faster with the help of the e-learning system than in the traditional faculty-led lectures.	3.49	Neutral
19. The e-learning system, as a learning environment, prohibits students from developing their social skills.	3.57	Agree
20. Faculty are unable to deliver courses and manage student effectively through the e-learning system.	3.52	Agree
21. The high cost of development prohibits the e-learning system to be developed to its full potential.	3.58	Agree
Average Mean	3.63	Agree

Table 3 *Faculty perception in e-learning*

Indicators	Mean	Interpretation
1. The e-learning system in your institution helps to support and improve communication between faculty and students.	3.80	Agree
2. The e-learning system in your institution helps to minimize the academic workload of faculty.	3.20	Neutral
3. The e-learning system in your institution helps to enhance the knowledge and understanding that students gain from lectures, tutorials, and practicals.	3.40	Neutral
4. The e-learning system in your institution helps to make administering tests and quizzes easier for the faculty and students.	3.20	Neutral
5. The e-learning system in your institution enables students to learn at a place and time of their choosing.	3.60	Agree

6. The e-learning system allows the faculty to track the performance of students and provides students with the ability to track their own performance.	3.00	Neutral
7. The faculty spend sufficient amount of time in supporting the students' exploration of topics posted in the e-learning system.	2.80	Neutral
8. The students are sufficiently motivated in using the e-learning system.	3.00	Neutral
9. The e-learning system can only be utilized by qualified faculty.	3.40	Neutral
10. The IT setup and network connectivity is sufficient to provide every faculty and student easy access to the e-learning system.	2.60	Neutral
11. The e-learning system can only be utilized by technology-savvy students.	3.40	Neutral
12. The e-learning system enables students to access educational materials in a variety of learning elements and media format (e.g., HTML content, videos, audio recordings, text files, presentations, FAQs, etc).	3.20	Neutral
13. The e-learning system makes it easier for faculty to track the-learning progress of individual students.	2.80	Neutral
14. The e-learning system helps to provide students with opportunities to exchange ideas with each other and even learn from their mistakes and experiences.	2.40	Disagree
15. The materials provided in the e-learning system provides students the opportunity to study part-time and make-up for lost lessons in case they incur absences in classroom sessions.	3.60	Agree
16. The e-learning system enables students to cover more-learning materials per course.	3.40	Neutral
17. Sufficient measures have been taken to prevent students from hacking the course materials or cheating by sharing assignments and online tests answers.	2.40	Disagree
18. Students learn much faster with the help of the e-learning system than in the traditional faculty-led lectures.	2.60	Neutral
19. The e-learning system, as a learning environment, prohibits students from developing their social skills.	3.20	Neutral
20. Faculty are unable to deliver courses and manage student effectively through the e-learning system.	3.20	Neutral
21. The high cost of development prohibits the e-learning system to be developed to its full potential.	3.00	Neutral
Average Mean	3.10	Neutral

Table 4 Faculty and students' perception in e-learning

Indicators	Mean	Interpretation
1. The e-learning system in your institution helps to support and improve communication between faculty and students.	3.77	Agree
2. The e-learning system in your institution helps to minimize the academic workload of faculty.	3.90	Agree
3. The e-learning system in your institution helps to enhance the knowledge and understanding that students gain from lectures, tutorials, and practicals.	3.74	Agree
4. The e-learning system in your institution helps to make administering tests and quizzes easier for the faculty and students.	3.95	Agree
5. The e-learning system in your institution enables students to learn at a place and time of their choosing.	3.82	Agree
6. The e-learning system allows the faculty to track the performance of students and provides students with the ability to track their own performance.	3.68	Agree
7. The faculty spend sufficient amount of time in supporting the students' exploration of topics posted in the e-learning system.	3.45	Neutral
8. The students are sufficiently motivated in using the e-learning system.	3.39	Neutral
9. The e-learning system can only be utilized by qualified faculty.	3.61	Agree
10. The IT setup and network connectivity is sufficient to provide every faculty and student easy access to the e-learning system.	3.41	Neutral
11. The e-learning system can only be utilized by technology-savvy students.	3.37	Neutral
12. The e-learning system enables students to access educational materials in a variety of learning elements and media format (e.g., HTML content, videos, audio recordings, text files, presentations, FAQs, etc).	3.55	Agree
13. The e-learning system makes it easier for faculty to track the learning progress of individual students.	3.51	Agree
14. The e-learning system helps to provide students with opportunities to exchange ideas with each other and even learn from their mistakes and experiences.	3.41	Neutral
15. The materials provided in the e-learning system provides students the opportunity to study part-time and make-up for lost lessons in case they incur absences in classroom sessions.	3.66	Agree
16. The e-learning system enables students to cover more-learning materials per course.	3.71	Agree
17. Sufficient measures have been taken to prevent students from hacking the course materials or cheating by sharing assignments and online tests	3.55	Agree

answers.		
18. Students learn much faster with the help of the e-learning system than in the traditional faculty-led lectures.	3.44	Neutral
19. The e-learning system, as a learning environment, prohibits students from developing their social skills.	3.55	Agree
20. Faculty are unable to deliver courses and manage student effectively through the e-learning system.	3.50	Neutral
21. The high cost of development prohibits the e-learning system to be developed to its full potential.	3.55	Agree
Average Mean	3.60	Agree

2. The strengths and weakness of the implemented e-learning facility of FEU Institute of Technology

Based on the results of the analysis, the following are the perceived strengths of the e-learning facility:

- It helps to minimize the workload of faculty, as it facilitates tracking of students' performance and learning progress, as well as making easier the administration of class activities such as exams and quizzes.
- It helps enhance the knowledge and understanding of students from the varied activities and learning materials that can be accessed.
- It helps to support and improve communication between faculty and students.
- The materials provided in the e-learning system gives students the opportunity to study part-time and make-up for lost lessons in case they incur absences in classroom sessions, thus enabling the students to learn at their choice of place and time.
- As a security measure, sufficient actions have been taken to prevent students from hacking the course materials or cheating by sharing assignments and online tests answers. Further, the facility can only be utilized by qualified faculty.

Based on the results of the analysis, the following are the perceived weaknesses of the E-learning facility;

- The faculty spend insufficient amount of time in supporting the students' exploration of topics posted in the e-learning system as the e-learning facility is designed to be utilized by technology-savvy students.
- The students are insufficiently motivated in using the e-learning system. They learn faster with the traditional faculty-led lectures than with the help of the e-learning facility.
- There is no provision for students to exchange ideas with each other and even learn from their mistakes and experiences.
- The IT setup and network connectivity is insufficient to provide every faculty and student easy access to the e-learning system.

3. Opportunities and threats drawn from the assessment of the e-learning facility.

Based from the strengths, the following are the perceived opportunities of the e-learning facility.

- Since the faculty can track the students' performance, badges may be issued to motivate the students to perform better in class. Faculty will be able to perform other academic-related activities.
- Students can track their academic performance, thus the initiative on their part to pursue better grades.
- Mining of students' data could be a potential in determining the characteristics of students who passed and failed the subjects, thus interventions could be done so that passing rate will be increased.
- Other forms of media could be used to improve teaching and learning activities.
- Social media tools which include forums, chat, personal messages can be beneficial in improving communication between faculty and students.
- The e-learning facility encourages students to self-paced learning.
- No authorized users can penetrate the e-learning facility based on the security measures implemented by the institution.

Based from the weaknesses, the following are the perceived threats of the e-learning facility.

- Familiarity of the e-learning facility and resources could cause intimidation to technically inexperienced students.
 - The full potential of the e-learning facility is not yet maximized which causes students not to embrace the e-learning technology.
 - Interaction among students is prevented due to restrictions settings, thus exchange of ideas is limited.
 - The e-learning infrastructure is not sufficient to support the performance of the e-learning facility, especially when it comes to concurrency of users.
4. Web technologies that can be used as e-learning tools in higher education

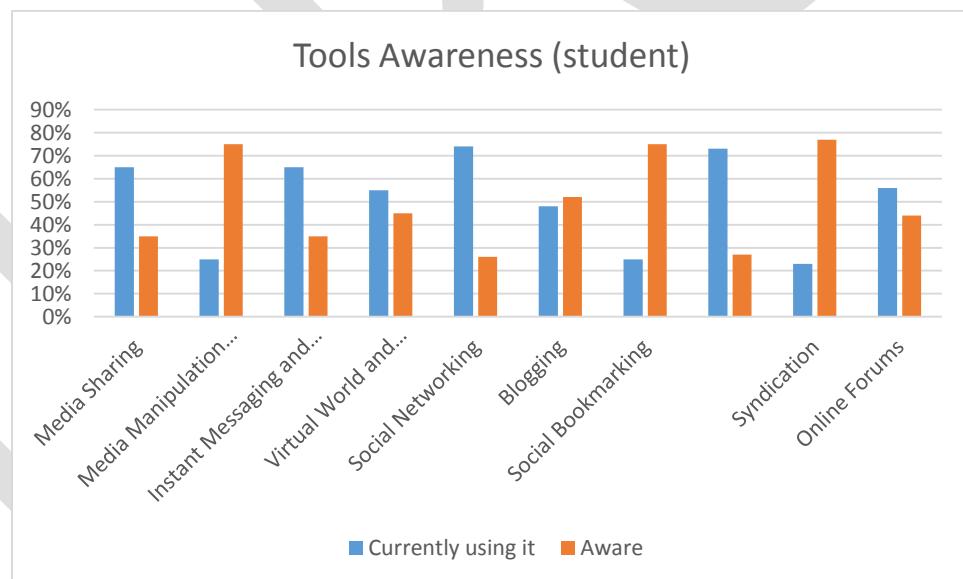


Figure 1 Tools Awareness (student)

Figure 1 shows that 65%-74% of the students are currently using social networking media, media sharing, instant messaging and chat, and wikis and collaborative editing tools. However, 75%-77% are aware of media manipulation and mashups, social bookmarking, and syndication.

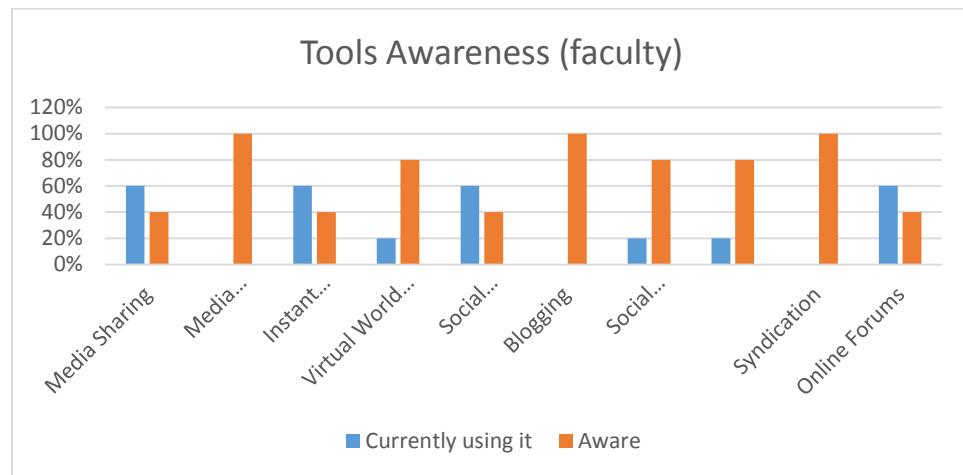


Figure 2 Tools Awareness (faculty)

Figure 1 shows that 60% of the faculty are currently using media sharing, instant messaging and chat, social networking media, and online forums. However, 80%-100% are aware of media manipulation and mashups, virtual world and online games, blogging, wikis and collaborative editing tools, and syndication.

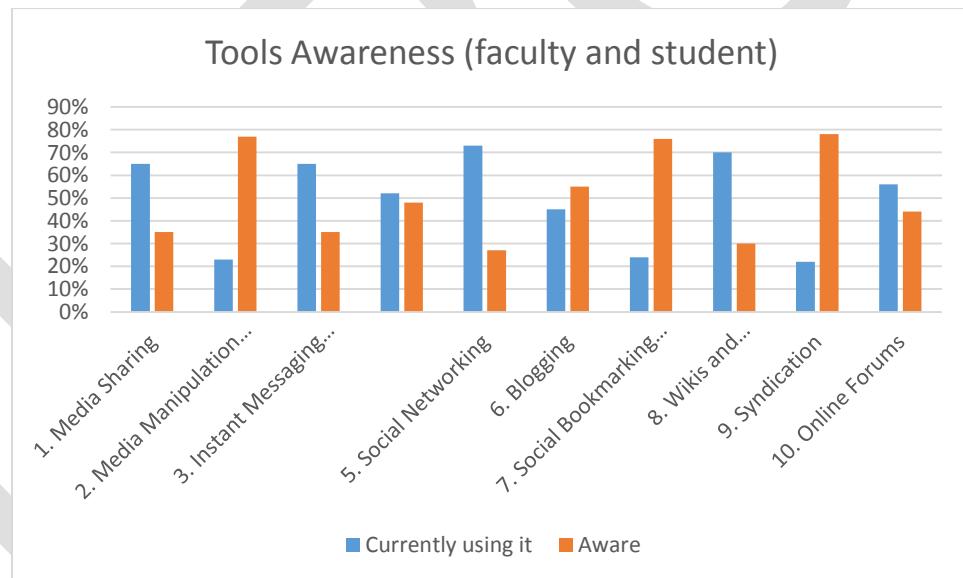


Figure 3 Tools Awareness (faculty and student)

Figure 3 shows that 65%-73% of both the faculty and students are currently using media sharing, instant messaging and chat, social networking media, and wikis and collaborative editing tools. However, 76%-78% are aware of media manipulation and mashups, social bookmarking, and syndication.

5. The effectiveness of the implementation of e-learning based from faculty and students assessment.

In terms of student assessment on e-learning implementation, Table 2 shows that the student assessment recorded an arithmetic mean of 3.63 with an interpretation result as “Agree” or effective in the usage of e-learning facility.

In terms of faculty assessment on e-learning implementation, Table 3 shows that the faculty assessment recorded an arithmetic mean of 3.10 with an interpretation result as “Neutral” as moderately effective in the usage of e-learning facility.

In totality, the assessment of e-learning facility both from students and faculty as shown in Table 4, gained an arithmetic mean of 3.60 with an interpretation of “Agree” or effective in the usage of e-learning facility.

ACKNOWLEDGMENT

If acknowledgement is there wishing thanks to the people who helped in work than it must come before the conclusion and must be same as other section like introduction and other sub section.

CONCLUSION

The application of technology has dramatically changed the delivery of education. E-learning is the integration of technology in education that covers a variety of activities to support the teaching and learning practice. For the past two years of e-learning implementation in FEU Institute of Technology, the teaching and learning practice has improved through various web technologies. However, limited features of the e-learning facility had been utilized due to some restriction settings. Implementing some other features needs proper orientation to students who are technically inexperienced to motivate the students to embrace e-learning technology. The e-learning infrastructure, such as the server specifications and network connection, should be given importance to effectively support the performance of the e-learning facility.

Web technologies like media sharing, instant messaging and chat, social bookmarking, and syndication can be integrated as e-learning tools in higher education.

In general, the implementation of e-learning facility in FEU Institute of Technology is effective in the improvement of teaching and learning practice.

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