Evaluating E-Learning Uptake in a Malaysian Higher Education Institution

Lip Sam Thi [1)] Mohd Noor Mohd Sharif [2)] Amer Darus [3)] Tian So Lai [4)]
[1) 2) 3) 4)] College of Business
Universiti Utara Malaysia
Sintok, Malaysia
email: thi@uum.edu.my

***Abstract*— This quantitative research using survey approach focuses on e-learning uptake in a Malaysian institution of higher learning. It is aimed to provide knowledge on the extent of e-learning uptake among its undergraduates and its perceived impact of e-learning on students' studies. The results from this study also include providing conceptual lenses and suggest directions for future regarding how to accomplish e-learning benchmarking and quality assurance in learning for higher education.**

Keywords- E-learning; LMS; Benchmarking; Quality assurance

I. INTRODUCTION

Educational institutions all over the world are seeking to fill the demands for education. One of the significant solutions is by taking advantage of the various information communication technologies (ICT) available today. The rapid growth of the Internet and information technologies has influenced the way in which education is being delivered (Dodd et al. 2009). Due to the exponential growth of the Internet and information and communication technology, Learning Management System (LMS), electronic learning or e-learning have emerged as the new paradigm in modern education. The concept of e-learning, in the widest meaning towards openness was also emphasised by Anderson & Elloumi (2011).

The proliferation of e-learning in education institutions is expected due to World Wide Web and Internet. Four key factors that also drive the usage of e-learning and LMS are the need for flexibility in teaching and learning, geographical independence, web-based environment that offer many opportunities for enriching learning process and, the rapidly changing nature of knowledge (Abdullah, Koren, Muniapan and Rathakrishnan, 2008).

The advantages of LMS and e-learning include freeing interactions between students and lecturers, or between students and students from the limitations of time and space through the asynchronous and synchronous learning network model (Olaniran, 2006). Furthermore, e-learning offers great potential to those who are working and have the desire to further their study on a part-time basis. In the past, those who want to study may have to leave their jobs because they have to attend classes. With the advent of e-learning, not only individuals can keep their jobs but also further their study at any institutions that offer education with the use of ICT tools.

Other benefits of benefits include provide learning opportunities to students at a reduced cost and increased access to learning for disadvantage students due to geographical barriers (Jihad & Sondos, 2006). Students will not be constrained by locations, but also time constraint because learning is determined by their own pace. In addition, e-learning has the potential to provide a high quality education and training for all, producing competitive workforce and increase the level of information technology literacy among students (UNESCO 2010). Alexander (2001) summed up the benefits of e-learning and LMS in terms of improving the quality of learning, improving access to education and training, reducing the costs of education and improving the cost-effectiveness of education

E-learning has become an alternative to the traditional learning. E-learning helps to overcome the challenges faced by traditional learning. A new technology such as web-based authoring tools in delivering educational programs is a flexible educational process (El-Seoud, Al-Khasawneh & Awajan 2007). Therefore, the uptake of e-learning and LMS is imperative for institutions as well as the student themselves

Some researchers argued the success and usage of LMS need to understand the issues that promote the effective use of the technologies including quality benchmark, pedagogical, content and technological infrastructure (Jebeile & Reeve, 2003).

Despite the growing body of literature on the motivations for the uptake of e-learning from the perspective of students, lecturers and educational institutions (e.g. Selim, 2007; Wang, Zhu, Chen & Yan, 2009; Ellis, Jarkey, Mahony, Peat, & Sheely, 2007; Lau, 2009; & Horn & Pierson-Balik, 2005), only few studies have been carried out to examine LMS or e-learning uptake among individual students from institutions of higher learning especially in the Malaysian context. With the proliferations of Web 2.0 technologies, various innovative e-learning applications are already in placed to enhance students' communications and sharing learning experience. These new applications emerging from Internet hyperlinks and Web 2.0 technologies are new innovations have attracted researchers. Currently, limited attention has been paid to e-learning quality that could determine e-learning uptake. Hence, apart from investigating the extent of e-learning uptake among undergraduates in a Malaysian higher education institution namely, University Utara Malaysia (UUM), this study will use the information collected to compare with e-learning benchmarking adopted

by international education agencies and proposed what to benchmark in the context of UUM.

A. Problem Statement

Benchmark creates a standard or reference point and it is generally defined as the criterion by which something is measured, scored or judged. Benchmarking for e-learning have been developed internationally (Ossiannilsson, 2012). *However, benchmarking of e-learning is very much in* infancy phase in Malaysia. Effort such as benchmarking of virtual campuses in Europe and CHIRON that refers to the project on innovative technological solutions for ubiquitous learning are some e-learning benchmarking initiatives.

It was the intention of this study to adapt a set of indicators to benchmark e-learning that help to examine the uptake of e-learning in UUM or other higher education institutions in Malaysia. The purpose was not to impose the benchmarking activity or used for comparison between universities. It is basically aims to help institutions to assess the uptake of e-learning against benchmarks developed by advanced nations. Based on Australian case Studies of e-learning benchmarks, a set of benchmarks are derived for consideration and used in benchmarking e-learning uptake in this study.

The Australian Case study had identified over 250 indicators for e-learning in an environment scan of Australian education agencies. However, literature surrounding benchmarking on e-learning is limited in Australia and locally. Interest in data about e-learning in terms of uptake and used by clients inspired a framework being developed and trial a set of 35 indicators that informed on Course, Communication, Discussion/Forum, View, Helpdesk/Support and Link To.

Besides benchmarking e-learning uptake, this study had been extended to examine the perceived impact of uptake of e-learning on students' studies. The lack of empirical evidence on students' uptake and its impact of e-learning on students' studies are the key objectives for conducting this study.

B. Research Questions and Objectives

This study is aimed to seek answers to the following research questions:

a. What is the extent of e-learning uptake among undergraduates based on selected set of benchmarks?
b. What are the students' perceptions on the impact of e-learning on students' studies?

The following research objectives are derived to provide answers to the research:

a. To determine the extent of e-learning uptake among undergraduates based on international benchmark
b. To determine students' perceptions on the impact e-learning on students' studies

C. Significance of Study

E-Learning benchmarking data provides evidence for different stakeholders. However, there is only limited information available to show the uptake of e-learning based on selected set of benchmark. This study has recognized the potential in undertaking benchmarking to improve the content and delivery development, change management and IT planning for e-learning uptake. Key benefits of undertaking e-learning benchmarking whish are listed in six broad purposes namely Course, Communication, Discussion/Forum, View, Helpdesk/Support and Link, can provide input for future e-learning system development initiatives by stakeholders such as lecturers, administrators, information system vendors, student support and management staff. Universities can also developed future learning strategies based on empirical evidence derived from this study.

D. Scope of Study

The scope of e-learning uptake in the present study is limited to the use of web-enabled LMS to improve the quality and flexibility of learning for all undergraduates. More specifically, LMS in the present study is UUM learning portal namely, ***Learningzone*** that is accessible by all UUM students. Learningzone is a new initiative implemented by UUM to replace the legacy system known as Learning Care since year 2010. Though the learning portal applications offer flexible and qualitative learning for all students, the focus of the current study is only on the undergraduates and does not include postgraduate students.

E. Definitions of Term

Generally the term e-learning is defined as use of electronic media to deliver flexible learning. It includes access to, downloading and used of web, CD or computer learning resources in classroom or at home. It also incorporates access to and participates in course activities such as group discussions and assessment activities. The term is used interchangeably with learning management system (LMS) which refers to as UUM Learningzone.

II. LITERATURE REVIEW

The past decade has seen an enormous growth in the use of Learning Management Systems (LMS) in higher education institutions locally and abroad. In theory at least, the reasons for this is that LMS has provided the potential for rich learning environments to on campus students, as well as those who are pursuing distant learning programmes (Meyer, 2002).

Much has been published about what constitutes good online teaching (e.g. Lin, Ma & Lin, 2011; Sarsa, J. & Soler, R, 2012), and this literature has expanded with institutional interests in quality of online learning environments (e.g. Ceobanu, Criu & Asandulai, 2009; Davis, Sauber & Edwards, 2011; Marsahll, 2012) However, the literature on the uptake of LMS or e-learning is limited. Recognizing the gap in the literature related to the lack of empirical findings and benchmarking frameworks on e-learning uptake, more studies ought to be conducted to examine this area of study.

A. Definitions of E-Learning

There is no consensus as to the definition of e-learning. Past studies have provided different definitions for e-learning and used various terms for e-learning such as Learning Management System (LMS), online learning, online education, distance education, distance learning and web-based learning (Hayen et al., 2004; Halawi & McCarthy, 2009). E-learning is also defined as web-based learning which utilizes web-based communication, collaboration, multimedia, knowledge transfer, and training to support learners' active learning without the time and space barriers (Lee, Youn & Lee, 2009).

Similarly, the term e-learning is synonymous to the used of information and communication technology (ICT) in the area of education. It is also known as computer support instruction, online education or computer-aided education (Fallon and Brown, 2003). Generally, e-learning consists of two categorizes. Firstly, asynchronous learning that enables interaction for individuals or groups at anytime and anywhere. Secondly, synchronous learning that enables interaction among instructors and learners at the same time.

Urdan and Weggen (2000) highlighted that e-learning has a wide range of learning strategies and technologies from the use of CD-ROMS, live audio/video-conferencing, TV lectures, live chat, discussion forums, course announcements and virtual education based on web semantics. Components of e-learning comprised of content delivery in multiple formats, management of the learning experience, and a networked community of learners, content developers and other information system experts who worked in tandem to enable e-learning (Gunasekaran, McNeil, & Shaul, 2002). E-learning is used to describe the use of any electronic means in the area of education. Gunasegaram, McNeil, and Shaul (2002) described this mode of learning as internet enabled learning.

Lee, Youn and Lee (2009) defined e-learning as web-based learning which utilizes web-based communication, collaboration, multimedia, knowledge transfer, and training to support learners' active learning without the time and space barriers. It does not include email dissemination of course information and, email communication between lecturers and students.

Despite limited information about e-learning benchmarks, many institutions of higher learning are proceeding with the implementation of e-learning with the view to improve students' learning experience thereby improving learning performance. Hugh investment in e-learning technologies were aimed at improving quality and access, fostering innovation and increase flexibility in providing learning service to students (Mistry, 2008).

B. LMS Content and Network Externality

LMS has greater appeal to students because of the richness of content provided by the Internet as compared to traditional learning methods. The richness of the endorsed course content especially the variety of the course materials uploaded to LMS has made it more attractive to students compared to traditional learning. Furthermore, the Internet and the capability of Internet hyperlinks and interactivity allow students and lecturers to share and access multiple resources, in addition to the fundamental course content (Chang & Tung, 2008). Chen et al. (2003) found that students' satisfaction would be enhanced if they could obtain updated e-learning content on a regular basis. Updated content and new content may lead students to feel that LMS is a useful means of gaining new knowledge

With the advent of Web 2.0 and the introduction of social network tools such as face book, twitter, blog, forum and online chat, communications between students and, between students and academic staff have also being enhanced. Several studies have also examined the effect of network externality on the uptake of information technology from the aspect of critical mass that refers to the level of importance of students' perceptions of the uptake of e-learning by other students. In the case of LMS, this perception can create the bandwagon effect, if students perceived that increasing number of their classmates are using LMS, they will try out the system.

C. Theoretical Basis

Benchmarking is a quality assurance approach originates from a business and management context. It is a process for improving performance by constantly identifying, understanding and adapting best practices from inside and outside of organisations. It is focusing on the best practices by means of self-evaluation, including gathering systematic data and information from predefined benchmarks and subsequently formulates the road maps to achieve these benchmarks (ENQA 2009).

Benchmarking has developed into an essential tool for organisations and it is a vital component of good management practice. Many attempts for e-learning quality assurance schemes have been developed internationally by European Centre for Strategic Management of Universities (EMSU), Benchmarking e-learning: Embedding Learning Technologies Institutionally (ELTI) and VET E-Learning Strategy in Australia.

Unfortunately, there are no such national initiatives being developed in Malaysia other than individual effort among institutions of higher learning. The concept of quality in e-learning studies has been discussed and managed in a disjointed manner

In their studies on benchmarking, Phipps and Merisotis (2000) highlighted key benchmarks that include institutional support, course deployment, course structure, student support, faculty support, evaluation and assessment. Since

then, comprehensive reviews on benchmarking have been published by Bacsich (2011) and Re. ViCa (2009).

The European Association of Distance Teaching Universities (EADTU) presented e-learning benchmarking that covers three areas namely, management, products and services. These are in congruence with benchmarking framework by Frydenberg (2002), Shelton (2011) and E-Learning Quality model (ELQ model) (NAHE, 2008).

III. METHODOLOGY

The main objective of this study is to investigate LMS uptake among students and the perceived impacts on students' studies. The study is a quantitative study using survey approach. The population of the current study involves UUM students who are pursuing their basic degree programme. A sample frame was obtained from UUM Students Affair Department. A sampling frame is a list of population elements from which a sample can be drawn. Random sampling approach was adopted to identify the respondents. The questionnaires were distributed to the respondents being identified by representatives of various student residential halls. A dateline of two weeks was given to the students to return the questionnaires.

A. Questionnaire Design

The instrument for this survey comprised of two main components namely items that provide indications for benchmarking e-learning uptake and items that solicit information on factors that drive e-learning uptake. The items for LMS applications uptake are derived from UUM Learningzone that comprised of two menus namely the Main Menu and the Course Menu. The framework measures the adoption of e-learning through its uptake and use. The measures are based on a four-point ordinal measures ranging from 'Not Using' to 'Use all the times' to indicate the volume and sophistication of use by students. These measures are aimed to provide the benchmark on LMS uptake.

A set of 35 indicators are available from UUM Learningzone that informed on Course, Communication, Discussion/Forum, View, Helpdesk/Support and Link To. These indicators were obtained from UUM Learningzone.
Uptake and use of UUM Lerningzone for accessing course material

a. Uptake and use of UUM Learningzone for communication
b. Uptake and use of UUM Learningzone for discussion or Forum
c. Uptake and use of UUM Learningzone for viewing
d. Uptake and use of UUM Learningzone on helpdesk/support
e. Uptake and use of UUM Learningzone for link to other centres

IV. FINDINGS

Slightly more than two-third of the respondents is female (76.1%) while male respondents consisted of a quarter of the sample (23.9%). The gender composition reflects the student population trend in local institutions of higher learning whereby female students formed the majority of the student enrollment (Table 1).

TABLE I. GENDER

Gender	Frequency	Percent
Male	100	23.9
Female	319	76.1
Total	419	100

Based on results in Table II, the respondents who have returned the questionnaires came from the three colleges. Respondents form College of Arts (CAS) 40. 3 percent, followed by College of Business (COB) 38.7 percent while College of Law, Government and International Studies (COLGIS) 21 percent. This result is consistent because COB and CAS have larger student enrolment compared with COLGIS).

TABLE II. COLLEGE

College	Frequency	Percent
COB	162	38.7
CAS	169	40.3
COSGIS	88	21.0
Total	419	100.00

Table III shows more than half of the student sample is second year student (57.7%). This is followed by first year student (25.3%) and, third or final year students consist of 17 percent of the sample (Table 3).

TABLE III. YEAR OF STUDY

Year of Study	Frequency	Percent
First year	106	25.3
Second Year	242	57.7
Third /Final year	71	17.0
Total	419	100

Figures 1 to 3 provide a brief description of the various degree programmes pursue by the respondents based on their respective colleges namely COB, CAS and COLGIS.

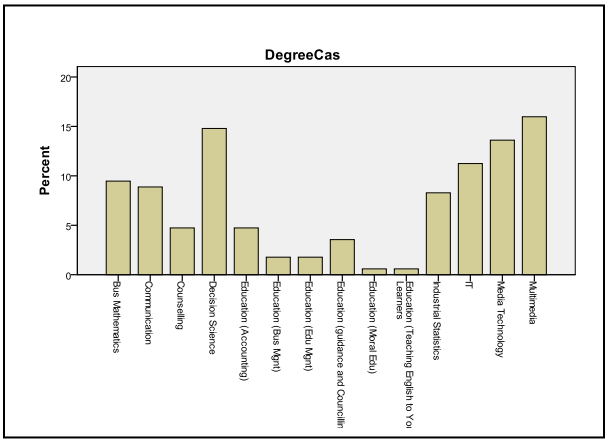

Figure 1. CAS

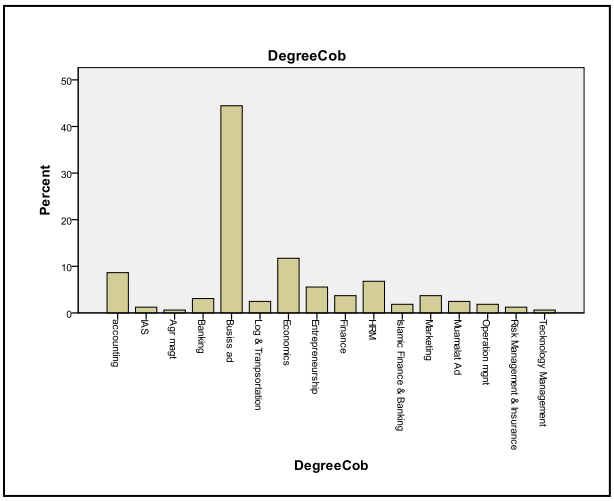

Figure 2. COB

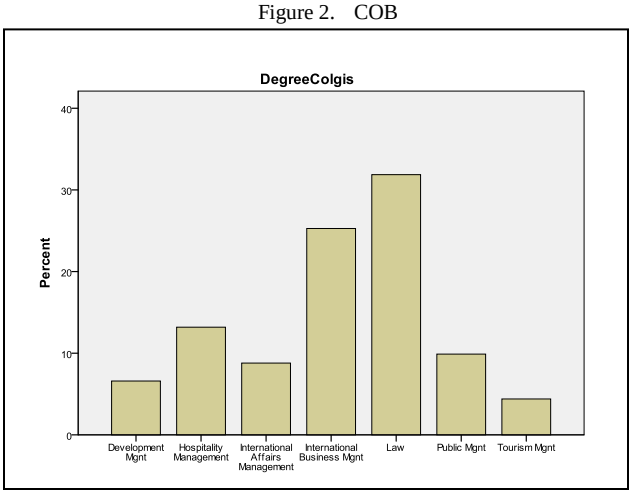

Figure 3. COLGIS

A. Frequency and Duration of Accessing Learningzone

Table IV indicates nearly half of the respondents (43.2%) accessed Learningzone a few times a week. Respondents who accessed Learningzone few times a month is about 30 percent of the total sample. Only 27.2 percent of the respondents have accessed Learningzone on a daily basis

TABLE IV. FREQUENCY ACCESSING LEARNINGZONE

Frequency accessing	Frequency	Percent
Daily	114	27.2
Few times a week	181	43.2
Few times a month	124	29.6
Total	419	100

In terms of average duration spend each time the respondents accessing the Learning, only 5 percent of the respondents had spent more than 1 hour. Nearly two third (71.8%) spent between 15 minutes to an hour accessing Learningzone. While the remaining 23.2 percent of the respondent stated they had spent 15 minutes or less each time on Learningzone (Table V).

TABLE V. DURATION SPEND AT LEARNINGZONE

Duration	Frequency	Percent
Less than 15 minutes	97	23.2
15 minutes to 30 minutes	167	39.8
31 minutes to an hour	134	32.0
An hour or more	21	5.0

B. Uptake of Learningzone Main Menu

In order to capture the extent of Learningzone application and usage, four measures were adopted to operationalise extent of usage which ranges from 1 “Not using” to 4 “Used all time”.

Results from Table IV indicate application that has the highest mean score usage 2.82 that reflect the most popular application used by the respondents is Google search, followed by View discussion (2.25), Post information (2.08), View Learning zone manual (2.07). Other applications with mean score of 2.0 and above are Link to COB website (2.05), provide comment and suggestion in forum (2.02), Link to Computer Centre, View new event (2.02), View forum (2.01) and Link to UMIS. Learningzone application with the lowest mean score (1.73) is View FAQ.

TABLE VI. LEARNINGZONE MAIN MENU USAGE

Applications	Mean
View FAQ	1.73
Google search	2.82
Discussion Room	
View discussion	2.25
Post information	2.08
Participate in Chat/Chatroom	1.96
STUDENT CORNER	
View Learningzone user manual	2.07
View Turnitin guide	1.97
LEARNINGZONE SUPPORT	
Contact Learningzone helpdesk	1.84
Post comment and suggestion on Leaningzone	1.90
Update Event	
View Learningzone calendar	1.89
View new events	2.02
Participate	
View Forum	2.01
Comment and suggestions in forum	2.02
LINK TO	
UUM CAS	1.98
UUM COB	2.05
UUM COLGIS	2.00
UUM UTLC	1.94
UUM Library	1.96
UUM Computer Centre	2.02
UUM UMIS	2.00

C. Uptake of Learningzone Specific Content Applications

Learnigzone specific content consists of My Course whereby students could access course materials and interacting with fellow course mates and course instructors. Some applications available are access to instructional material such as power point slides, communicating with course instructors and course mates via email messages, participate in forum, blogs as well as update personal profile and course mate's profile, view exam grades and subject/subject registered.

Table VII indicates the usage of all fourteen Learningzone applications for Specific Content has mean scores of above 2.0. The highest mean score is viewing course /subject registered (2.23), view exam grades (2.22), download course materials (2.15), send personal email to course mates (2.15) and course instructor (2.13), post messages to course mates (2.11) and lecturer (2.11). View and post blog and, view and post forum have mean scores of below (2.05).

TABLE VII. LEARNINGZONE SPECIFIC CONTENT USAGE

Applications	Mean
Download text, documents, power point slides	2.15
View course/subject registered	2.23
Sending personal message to lecturer	2.13
Sending personal message to course mate	2.15
Post messages to lecturer	2.11
Post messages to course mates	2.12
Post blogs	2.04
View blogs	2.01
Update personal profiles	2.07
Post forum	2.01
View forum	2.03
View news or announcement	2.12
View exam grades	2.22
View course mate profile	2.08

D. Indicators for Benchmarking E-Learning

Thirty four (34) applications from UUM Learningzone that serve as indicators for e-learning uptake were examined. These indicators provide information on six areas of interest:

a. Uptake and use of UUM Lerningzone for accessing course resources.
   Applications in this category including downloading text and document, web page file, power point slides
b. Uptake and use of UUM Learningzone for communication
   Applications include sending messages to lecturers and classmates.
c. Uptake and use of UUM Learningzone for discussion or forum
   Applications such as post information, participate in chat room, post comments, post in blog and forum.
d. Uptake and use of UUM Learningzone for viewing
   Applications including view discussions, Learningzone manual, turnitin guide, calendar, new events, view forum, course registered, view blogs, news and announcement, grades and view course mate profile

e. Uptake and use of UUM Learningzone on helpdesk/support
   Applications include helpdesk, post comment and suggestion on Learningzone
f. Uptake and use of UUM Learningzone for link to other centres.
   These applications include link to various websites namely COB, CAS, COLGIS, UTLC, Library, Computer Centre and UMIS.

E. Perceived usefulness of UUM Learningzone

Respondents' perceived impact of Learningzone is broadly consistent with mean scores of between 2.60-2.60 except for accomplishing task quickly (2.34), improve academic performance (2.52). Score of 1 indicates extremely likely which 6 indicates extremely unlikely. Generally, respondents' perceptions is that Learningzone has a positive impact on their study (Table VIII).

TABLE VIII. THE PERCEIVED IMPACT OF LERANINGZONE ON RESPONDENTS'' STUDIES

Applications	Mean
Accomplish task quickly	2.34
Improve academic performance	2.52
Increase productivity	2.60
Enhance study effectiveness	2.62
Make it easy for my study	2.63
Learningzone is useful	2.63

The results show that respondents' generally possessed positive perceptions and attitude towards impact of Learningzone on their studies.

a. 92% of the respondents said 'the use of e-learning enable them to accomplish their task quickly
b. 88% of the respondents said that 'Learningzone improve their academic performance
c. 85% of the respondents said that 'Learningzone increase their productivity
d. 84% of the respondents said that 'Learningzone enhance the effectiveness of their studies
e. 84% of the respondents said that Learningzone made it easier to do their studies
f. 83% of the students said that 'Learning zone is useful for their studies

V. CONCLUSION

This study is aimed to assess the uptake of e-learning against a set of benchmarks for e-learning and assess the impact of e-learning on students' studies. The results highlighted the e-learning services provided to the undergraduates were considered as satisfactory.

Based on the six benchmarks adopted from an Australian study, the uptake and use of e-learning to view discussion (mean score 2.25), course registered (2.23) and exam grades (2.22) indicated the popularity of these three applications. The uptake of other view applications such as to view news or announcement (2.12) user manual (2.07), new events (2.02), calendar (1.89). The applications for viewing that are less popular are view FAQ and Turnitin guide with mean scores of 1.73 and 1.97 respectively.

The uptake of e-learning for communication especially two-way communications such as posting messages or sending messages to lecturers (2.15) and course mates (2.13). The channel for two-way communications appears to be limited only to sending and receiving messages via emails.

For the uptake and use of learningzone for discussion or participating in forum, it appears to be less popular compared to posting in forum or blogs with a mean score of 2.0 for both applications. This may imply that students are more comfortable to communicate via messages rather than participating in group forum and discussions.

The uptake of e-learning applications for the purpose of assessing course resources or materials such as downloading documents such as lecture notes and power point slides are also popular with a mean score of 2.15.

The most popular application in the Learningzone that link to other website is Google Search (2.82). Other links are linked to academic centres especially link to COB (2.05) and COLGIS (2.0) and Computer Centre (2.2).

The uptake of applications related to client support services namely, helpdesk and posting suggestion to Learningzone have mean scores of 1.84 and 1.9 respectively.

Generally, students have positive perceptions about the benefits from using the Learninzone particularly in helping their studies with the mean scores of above 2.34. More than 80 percent of the students agreed that they have benefited for using the Learningzone. With the advent of web technologies and savvy internet users among young generation can only imply the importance of e-learning for future education.

Overall, the findings highlighted the need to allocate more resources to further enhance the Learningzone in particular applications which have been under utilized such as for the purpose to provide client support. Furthermore, more applications are needed to be developed for two-way communication between students and lecturers and between students. Currently, such communication only through emails. Furthermore, the uptake of e-learning for assessing course materials and course resources can further be enhanced as students mainly used to assess notes and power point slides.

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