E-learning Benchmarking Survey: A Case Study of University Utara Malaysia

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Abstract E-learning has emerged as a new paradigm in today's education. Many e-learning applications have been developed to meet the increasing demand by education institutions. Previous research mainly focused on a variety of factors that influence the uptake of e-learning. However, very little is known about the quality and the extent of usage of these applications among end users. This study presents results that contain information on the uptake and use of e-learning. The uptake of e-learning is measured by the extent to which different technologies were used by students. A mail survey was conducted to examine the uptake of e-learning among undergraduates. The respondents for this study comprised of 419 respondents representing 16.8% from a random sample size of 2500 students. Thirty four applications available from Universiti Utara Malaysia Learning information system (Learningzone) were grouped into six categories that served as e-learning benchmarks to assess the uptake of e-learning among undergraduates. The results show that accessing for course materials, communications, viewing information are the commonly used applications while helpdesks and support, and link to other centres are least popular among undergraduates.

Keywords E-learning, Learning Management System, Benchmarks, Quality Assurance

1. Introduction

The rapid growth of information technology has influenced the way which education is being delivered today. Due to the exponential growth of the internet and web technologies, e-learning has emerged as the new paradigm in modern education. The advantages of e-learning is a plenty that includes; freeing interactions between learners and instructors, or between learners and learners and, from the constraints of time and space. Other benefits of e-learning include providing learning opportunities to all at a reduced cost and increased access to learning opportunities for disadvantaged groups due to physical and geographical barriers. These are significant drivers, especially for adult learners who wish to keep their jobs and further their studies at any institutions with the use of modern technologies. Hence, Education institutions need to invest or enhance their e-learning capacities and capabilities to keep in pace with the rapidly changing teaching and learning pedagogy. Many institutions such as universities have placed a lot of attention to introduce advanced technologies in their respective institutions for teaching and learning purposes.

However, investments to develop LMS or e-learning infrastructure and course contents are costly. Furthermore, Web 2.0 technologies such as podcasting, web-based authoring tools, wikis, real simple syndication (RSS) and other social networking tools are widely available to individuals. The emergence of myriad web 2.0 tools and continued usage of legacy technologies have created questions about the effectiveness and efficiency of these technologies. Subsequently, studies on the performance, quality, usage and benchmarking of e-learning have attracted the interest of researchers [9].

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 [40]. However, benchmarking of e-learning is very much in infancy phase. Various benchmarks are being developed and adopted by various researchers. Examples such as benchmarking of virtual campuses in Europe and, CHIRON that refers to the project on innovative technological solutions for ubiquitous learning. Other worldwide e-learning benchmarking initiatives are also being introduced by Europeon nations, Australia and United States.

This study will examine the usage of e-learning applications based on a set benchmarks adapted from an Australian Case Study conducted by Flexible Learning Advisory Group (FLAG). It has identified over 250 indicators for e-learning in an environmental scan of Australian education agencies.

The objective of this study namely is to examine the nature and the uptake of e-learning applications. A set of 34 indicators from UUM learning management system or the Learningzone were categorised into six categories namely; Course Content, Communication, Discussion/Forum, View,

Helpdesk/Support and Link-To, that provide the basis of benchmarking for this study will be examined.

2. Literature Review

E-learning is defined as web-based learning which utilises web-based communication, collaboration, multimedia, knowledge transfer, and training to support learners' active learning without the time and space barriers [29]. More often, the term e-learning is also 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 [34, 19].

[49] 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. E-learning is used to describe the use of any electronic means in the area of education. [21] described this mode of learning as internet enabled learning. Hence, it is expected that the quality and effectiveness of internet based learning have attracted the attention of researchers and policy makers. Quality assurance for e-learning is vital to enable this mode of learning achieved its objectives.

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 company. 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 [16]. 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 services to students [9]. Benchmarking information could be used to identify areas that are well accepted by students or clients and those that are limited and in need of improvement.

Benchmarking has been 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 Institute (ELTI) and VET E-Learning Strategy in Australia. Unfortunately, there is limited national initiatives being carried out in Malaysia other than individual effort among institutions of higher learning and the concept of quality in e-learning studies has been discussed and managed in a disjointed manner.

In their studies on benchmarking, [41] highlighted key benchmark components 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 [4] and [43].

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[20], [46] and E-Learning Quality model (ELQ model) [35].

According to Dublin [13], to ensure e-Learning is used by individuals, it needs to provide a learning solution and drive study performance. [17] highlighted that six key factors that underpinned e-learning uptake namely by delivering what learner needs, putting learners at the heart of learning, providing high quality content and technology, support from top management, providing proactive support through communication, promotion and marketing and, creating organisations that values learning.

3. Methodology

A questionnaire survey was used to gather data for this study. Personalised cover letters and addresses were used to explain the purpose of the study to the responsents. The respondents were requested to return the questionnaires using the stamped returned enveloped provided. The respondents were given a duration of two weeks to respond to the survey.

The population for this study comprised of undergraduates from University Utara Malaysia. A random sample size of 2500 students was selected for this study. A sample size of 419 responses representing 16.8% usable questionnaires were returned and subsequently used for data analysis.

The instrument for this survey comprised of items that provide indicators for benchmarking 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. Section A, obtained information about respondents background; Section B, comprised of items that gather information about the usage of applications in the Main Menu and; Section C, solicit information about the usage of Specific Content Menu in the *Learningzone.*

A set of 34 indicators derived from UUM *Learningzone* that were grouped into; Course, Communication, Discussion/Forum, View, Helpdesk/Support and Link To. The items measure 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 frequency and sophistication of use by students.

4. Findings

Respondents Profile

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

Table 1. Gender

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

Table 2 shows more than half of the student sample comprised of 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 (refer to Table 2).

Table 2. 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

Frequency and Duration of Accessing *Learningzone*

Table 3 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 number of respondents. Only 27.2 percent of the respondents have accessed *Learningzone* on a daily basis.

Table 3. Frequency Accessing *Learningzone*

Frequency accessing *Learningzone*	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 *Learningzone*, 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 respondents stated they had spent 15 minutes or less each time when they logged into *Learningzone*.

Table 4. 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
Total	419	100

Uptake of *Learningzone* Main Menu

In order to capture the extent of *Learningzone* applications usage, four measures were adopted to operationalize the extent of usage which ranges from 1 (Not using) to 4 (Used all time). Results from Table 5 indicate Google Search has the highest mean score usage 2.82 that reflect the most popular application used by the respondents, followed by View Discussion (2.25), Post Information (2.08), and View *Learningzone* User Manual (2.07). Other applications with mean score of 2.0 and above are Link to UUM COB website (2.05), Comment and Suggestion in Forum (2.02), Link to UUM Computer Centre (2.02), View New Events (2.02), View Forum (2.01) and Link to UUM UMIS. *Learningzone* application with the lowest mean score (1.73) is View FAQ.

Table 5. Usage of *Learningzone* Main Menu

Applications	Mean
View FAQ	1.73
Google Search	2.82
Discussion Room	
View Discussion	2.25
Post Information	2.08
Participate in Chat/Chat Room	1.96
Students' Corner	
View Learningzone User Manual	2.07
View Turnitin Guide	1.97
Learningzone Support	
Contact Learningzone Helpdesk	1.84
Post Comment and Suggestion on Learningzone	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 COB	2.05
UUM CAS	1.98
UUM COLGIS	2.00
UUM UTLC	1.94
UUM Library	1.96
UUM Computer Centre	2.02
UUM UMIS	2.00

Social media is increasingly popular being adopted by society. Facebook, Tweeter, LinkedIn and blogs are popular social media tools for posting information, communication, discussion and sharing information. Some of these tools have been provided in the *Learningzone* albeit in a simplified manner unlike those provided by Facebook, LinkedIn, Tweeter and microblogs. The mean value for Posting Information at *Learningzone* is 2.08. Respondents' participation on Chat with mean usage value of 1.96. As for View Forum the mean value is 2.01 and Post Comment in Forum with mean value 0f 2.0. Finally, the mean usage value for Post Comment in Forum is 2.02.

Student Corner and *Learningzone* Support are developed to assist students to use the *Learningzone*. Tools that are available for these purposes are User Manual, Turnitin Guide, Helpdesk and, Post Comment and Suggestion. The mean usage value for User Manual is 2.07, Turnitin Guide 1.97, Helpdesk 1.84 and, Post Comment/Suggestion 1.90. In order for students to keep track of events and activities organized by the university, tools such as *Learningzone* Calendar and View New Events are provided. The mean usage values for these two tools are 1.89 (*Learningzone* Calendar) and 2.02 (View New Events).

Students often accessed other websites via links provided in the *Learningzone*. These links include websites of the three colleges; namely COB, CAS, and COLGIS, University Teaching and Learning Centre (UTLC), University Library, Computer Centre and UMIS. The results from Table 6 indicate that the mean usage for Link to COB website by respondents is (2.05), CAS (1.98) and COLGIS (2.0). The mean usage value for Link to UTLC is 1.94, Link to UUM Library 1.96, Computer Centre 2.02 and UMIS 2.00.

Uptake of *Learningzone* Specific Content Applications

Learningzone 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 instructors' material such as power point slides, communicate with course instructors and course mates via email messages, participate in forum, blogs, update personal profile, view course mate's profile, view exam grades and subject/subject registered.

Table 6 indicates the usage of all fourteen *Learningzone* applications for Specific Content had mean scores of above 2.0. The highest mean score is View Course/Subject Registered (2.23), View Exam Grades (2.22), Download Text/Documents/Power Point Slides (2.15), Sending Personal Message to Course Mates (2.15) and Sending Personal Message to Course Instructors (2.13), Post Messages to Course Mates (2.11) and Post Messages to Instructors (2.11). View and Post Blog and, View and Post Forum had mean scores of below (2.05). These results also indicate that respondents' frequent usage of applications in the Specific Content page compared to Main Menu page at *Learningzone*.

Table 6. *Learningzone* Specific Content Usage

Applications	Mean
Download Text/ Documents/ Power Point Slides	2.15
View Course/Subject Registered	2.23*
Sending Personal Message to Instructors	2.13
Sending Personal Message to Course Mates	2.15
Post messages to Instructors	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 Profiles	2.08

Indicators for Benchmarking E-Learning in UUM

Thirty four (34) applications from UUM *Learningzone* that serve as indicators for e-learning uptake were examined. These indicators provide information on six (6) areas of interest:

(i) Uptake and use of UUM *Learningzone* for accessing course resources

Applications in this category including downloading text, document, webpage file and, power point slides. The only application in this category that enable students to download text and document, webpage file, power point slides. The mean usage value for this application is perceived to be high with a value of more than 2.

Applications	Mean
Download text, documents, power point slides	2.15

(ii) Uptake and use of UUM Learningzone for communication

Applications include sending messages to Instructors and classmates. Two applications to communicate with instructors and fellow course mates are also available. The mean usage for these applications is above 2 from a scale of 1 to 4.

Applications	Mean
Sending personal message to Instructors	2.13
Sending personal message to course mates	2.15

(iii) Uptake and use of UUM Learningzone for posting information for discussion or forum

Applications such as post information, participate in Chat room, post comments, post in blogs and forum. The mean usage of applications to post information and discussions are

above 2 except for participation in chat.

Main Menu	Mean
Post Information	2.08
Participate in Chatroom	1.96
Comment/Suggestion in Forum	2.02
Post blogs	2.04
Update personal profiles	2.07
Post forum	2.01
Post messages to Instructors	2.11
Post messages to course mates	2.12

(iv) Uptake and use of UUM Learningzone for viewing

Applications including View Discussions, *Learningzone* User Manual, Turnitin Guide, Calendar, New Events, View Forum, View Course/Subject Registered, View Blogs, News or Announcement, View Exam Grades and View Course Mate Profiles. A majority of the applications have mean usage values of above 2, except for View FAQ, Calendar and Turnitin Guide.

Main Menu	Mean
View FAQ	1.73
Google Search	2.82
View Discussion	2.25
Learningzone User Manual	2.07
Turnitin Guide	1.97
Calendar	1.89
New Events	2.02
View Forum	2.01
View Course/Subject Registered	2.23*
View Blogs	2.01
View Forum	2.03
View News or Announcement	2.12
View Exam Grades	2.22*
View Course Mate Profiles	2.08

(v) Uptake and use of UUM Learningzone on helpdesk/support

Applications include Helpdesk, Post Comment/Suggestion about *Learningzone*. The mean usage values for helpdesk/support and suggestion are less the 2 that implied these two applications are not frequently used by respondents compared to other applications.

Applications	Mean
Learningzone Helpdesk	1.84
Post Comment/Suggestion about *Learningzone*	1.90

(vi) 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. Applications to Link with other UUM websites were examined. Website that link via *Learningzone* that have mean values of above 2 are Link to COB, COLGIS, Computer Centre and UMIS.

Applications	Mean
Link to COB	2.05
Link to CAS	1.98
Link to COLGIS	2.00
Link to UTLC	1.94
Link to Library	1.96
Link to Computer Centre	2.02
Link to UMIS	2.00

5. Discussion and Conclusions

This study is aimed to assess the uptake of e-learning against a set of benchmarks for e-learning. Based on the six benchmarks adapted 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) and New Events (2.02) are perceived to be satisfactory. The applications for viewing that are less popular are View FAQ, Calendar and Turnitin Guide with mean scores of 1.73, 1.89 and 1.97 respectively.

The uptake of e-learning for communication purposes is also popular among students. Two-way communications such as Posting Messages or Sending Messages to Instructors (2.15) and Course Mates (2.13) are commonly used by the respondents. However, the channel for two-way communication 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/content 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. This infers that *Learningzone* serves mainly as content repository in real sense that allow students to access to course reosurces at their convenience.

The most popular link application in the *Learningzone* is link to Google Search (2.82). Other popular websites that students access via *learningzone* are academic centres such as College of Business (2.05) and College of Law, Government and International Studies (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.

Overall, the findings highlighted the need to relook in particular, applications which have been underutilised such as for the purpose of providing client support. Furthermore, more applications are needed to be incorporated for two-way communication between students and instructors and also among students. Applications for communication only through emails is insufficient. Other Web 2.0 social medias such as Facebook, Tweeter, LinkedIn and blogs ought to be incorporated. Furthermore, the uptake of e-learning for assessing course materials and course resources can further be enhanced as students mainly used *Learningzone* to assess notes and power point slides. Applications such as podcasts, webinar, RSS and teleconference are some of the applications that could cater for learning and knowledge sharing.

Generally, the findings from this study illustrate that online learning presents opportunities but also a number of challenges to students specifically and the higher education sector broadly. These issues are not new to researchers in the field of online learning research (see for example: [18, 47, 37, 39, 24]).

Managerial Implications

[10] in a paper titled "*E-learning: The hype and the reality"* suggests that many believe that e-learning is transforming education. However, she argues that e-learning is still marginal in the lives of most students with technology being used for little more than acting as a content repository. While some applications or tools may assist student learning, nonetheless, online learning environments that restrict themselves only to delivering static resources such as downloading lecture notes and power point slides that do not characterise the quality online learning environments [39]. Furthermore, current practices of e-learning do not take account of learner characteristics which may influence learning.

For online learning to be effective, tertiary education institutions should engage learners as active participants in their learning. Achieving this means offering students opportunities for interaction in ways that can promote change and growth in the learner's conception of knowledge. Such pedagogies aim to encourage students to become autonomous learners, capable of problem solving and critical thinking, and to move them from being passive recipients of information and knowledge to being active, enthusiastic learners and knowledge creators [51]. However, such tools and applications that enable active and students' centered learning are found to be lacking in many e-learning environment. Many instances, the capability and potential of e-learning are restricted due to insufficient bandwidth, Internet speed or other physical barriers.

Education pedagogy is also concerned with building meaningful learning relationships between students and instructors, and students and their peers. It involves encouraging collaboration as well as cooperation in learning. The appropriation of Web 2.0 technology for teaching provides great opportunities for the promotion of innovative and interactive quality e-learning environments. Some of the pertinent Web 2.0 applications for collaborative learning such as podcasts, wikis, RSS, webinars and social networking tools have not been fully utilized by tertiary institutions' e-learning portals.

Conclusions

While the major findings of this study indicated evidence of an instructor centred and content focused e-learning approach, nonetheless students willingness to learn and engage more in the online environment cannot be denied. Though, many higher education institutions used information technologies as a key strategic to reducing costs and at the same time to support initiatives in advancing student centred flexible learning, and improving the quality of teaching, however, if the way in which the majority of LMS sites are perceived by students as content depository, the full benefits and potential of LMS are not being achieved.

Students demand more than a repository dump - they required an active and enthusiastic engagement from their teachers. The results indicate that *Learningzone* is a teacher centred approach online teaching. Though this study did not involve staff, nonetheless, academic staff namely instructors are of key stakeholders to determine the success of LMS.

Universities need to pay more attention to the institution's key stakeholders, students, and support academic staff and to advance the widely recognized potential of online learning. In other words, if academic teaching staff is to engage with technology in ways that encourage them to innovate, then institutions must 'make such efforts to enhance the learning of their students a high priority and back this in practice as well as in their rhetoric [25].

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