THE IMPORTANCE OF HUMAN CAPITAL PERSPECTIVE IN THE LEARNING MANAGEMENT SYSTEM (LMS) DECISION MAKING PROCESS AT UNIVERSITIES

Norhaiza Khairudin[1]
Rozainee Khairudin[2]
Mohd Noor Abdul Hamid[3]
Phillip Hancock[4]
Tanya McGill[5]
Zainah Ahmad Zamani[6]

[1]*Tunku Puteri Intan Syafinaz School of Accountancy, Universiti Utara Malaysia*

[2,6]*Pusat Penyelidikan Psikologi dan Kesejahteraan Manusia, Universiti Kebangsaan Malaysia*

[3]*School of Quantitative Sciences, Universiti Utara Malaysia*

[4]*Business School Teaching and Learning, The University of Western Australia*

[5]*School of Information Technology, Murdoch University*

ABSTRACT

This research examined how managers in universities incorporate non-financial measures in their Learning Management Systems decision-making processes and particularly focused on the importance of the Human Capital perspective in LMS decision making processes. A mixed-methods approach to data collection was used involving both interviews and questionnaires. The qualitative data from the interviews were coded and analysed. A descriptive coding method using thematic analysis was used for the data coding. The qualitative data were analysed using an inductive approach where the categories of criteria and indicators were not determined before the interview. The participants in this research were five members of LMS decision-making teams at two different universities in Australia and 24 participants from different universities in Malaysia who were involved in LMS decision- making processes at their universities. The results of this research indicated that there was substantial support for using a multi-dimensional decision making model among IT decision makers at universities, particularly the Human Capital perspective and they believed that Human Capital measures are important and should be considered in a LMS decision making process.The research has both implications for theory and for practitioners where it contributes to the knowledge on LMS decision making in universities and IT decision making in general, and also in improving actual decision making practices.

Keywords: *Human capital, human perspective in decision making, learning management systems, e-learning, information systems investments*

INTRODUCTION

The ever-increasing technology evolution has penetrated the education sector, placing pressure on universities to be competitive. Many universities have acknowledged the importance of technology in meeting new challenges in education and are making efforts to keep abreast with the technology. The advancement of technology is not only a trend, but a necessity, especially in meeting customers' (staff and students) needs, and achieving competitive advantage. In line with this, universities worldwide are investing in the Learning Management Systems (LMS) for more flexible learning options, improved teaching and learning processes, cost reduction, improved student engagement, and for the institutions' competitive advantage and reputation (Chua & Dyson, 2004; Coates, 2006; Kinkle, 2010; Laurillard, 2007; Mott & Granata, 2006).

Virtual Learning Environments (VLE) and Course Management System (CMS) are also used to describe such applications. However, LMS is used to refer to a broader application that includes the pedagogical activities in both VLE and CMS, plus a range of administrative tasks (OECD, 2005). A LMS, as defined by the Organisation for Economic Co-operation and Development (OECD) (2005), is "software designed to provide a range of administrative and pedagogic services (related to formal education settings e.g. enrolment data, access to electronic data materials, faculty/student interaction, assessment, etc.)" (p. 124). While this definition articulates the technical nature of a LMS as software, Klobas and McGill (2010) provide a definition which describes LMS from a managerial point of view, and regard it as having functions used in supporting and managing teaching and learning processes. They define a LMS as "an information system that facilitates e-learning by supporting teaching and learning activities and the administration and communication associated with them" (p. 115).

Many researchers have conducted studies that compared different types of LMS, for example Cavus and Zabadi (2014), who conducted a study that compared different types of open-source LMS and Al-Ajlan (2012) who carried out a study that compared ten different LMS including proprietary LMS and open source LMS. Both studies found that Moodle was regarded as the best LMS when compared to other software. However, Cavus and Zabadi (2014) also pointed out that Moodle, and another open-source LMS, ATutor, provide the best communication tools and provide user friendly interfaces. Al-Ajlan (2012) asserted that while Moodle was still considered the best software, it lacks some form of Sharable Content Object Reference Model (SCORM) support. Apart from that, Al-Ajlan (2012) also reported that ATutor was considered to have the strongest usability and Claroline was well known in over 80 countries and available in over 30 languages.

Considering the abundant functions that are offered by different types of LMS, the LMS decision-making process has become a very challenging and critical process. There have been some studies that address issues about LMS decision making that emphasise the importance of pre-implementation evaluation of LMS. While many studies focus on the realization of LMS success at the post-implementation phase (Alias & Zainuddin, 2005; Klobas & McGill, 2010; Lonn & Teasley, 2009), few studies examine what should be included in LMS decision-making processes (at the pre-implementation phase). Nor are there sufficient studies on examining the comprehensiveness of IT investment evaluation methods, which are used as a set of methodologies in selecting the alternative that offers the greatest returns or benefits for the organization.

Khairudin and Hamid (2015) proposed six perspectives that are important in the LMS decision making model namely Direct Payback, Impact on University's Processes, Human Capital, IT Infrastructure, Risks and Uncertainties, and Strategic Alignment. This paper is focused on the importance of human capital perspectives to be included in the decision making processes of LMS implementation especially in the higher education institutions settings. The human capital perspective considers the impact of LMS adoption on the user which includes academic staff and administration staff and students. Elements that have an impact on users, especially in terms of users' satisfaction, are relevant to this perspective. LMS adoption may also improve student engagement (Coates, 2006).

Several researchers, who have studied the use of BSC as a method to evaluate potential systems have suggested that user satisfaction is an important criterion to consider (Cribb & Hogan, 2003; Ruben, 1999). Ruben (1999), who used a BSC approach in developing higher education excellence indicators, suggested that user satisfaction with academic programs, support services and facilities are some measures that should be incorporated. Cribb and Hogan (2003), who developed a Library Balanced Scorecard for their university, identified some important criteria, which include satisfaction with resources, services and facilities, effective communication, as well as the quality, relevance and appropriateness of information resources provided.

The LMS adoption can also have adverse impacts on users. It can have an impact on instructors, where they may need to spend time on learning a new system in order to improve the quality of their teaching with the enhanced technology (Klobas & McGill, 2010). The adoption of a new system should consider both positive and negative impacts on users in order to achieve a successful system implementation.

The human capital perspective also considers how the sustainability and growth of the system can be maintained. In this perspective, empowerment and innovation are important in order to attain continuous improvement (Kaplan & Norton, 1993). Human capability in terms of skills and confidence with technology and the system's future growth and capability to support users' future needs, and cope with future enhancements in technology are important measures for this perspective.

In Malaysia, several studies about e-learning and LMS implementation and success evaluation have been conducted (Basir, Ahmad, & Noor, 2010; Embi, 2011; Ramayah, Ahmad, & Lo, 2010). Many of the studies focus on post-implementation evaluation and benefit realisation from the LMS. For example, Alias and Zainudin (2005) focus on the user aspects of the LMS diffusion process at a public university in Malaysia. They emphasise that, in adopting a new LMS, it is important that adequate opportunities are provided for staff training, which also encourages staff to share knowledge and skills and provide peer support. Continued usage and involvement by lecturers and students (Ramayah, et al., 2010) are also suggested to be factors that determine the benefit realisation from an instructional technology implementation. This is consistent with a study completed by Klobas and McGill (2010) who contend that the more involved a student is with the LMS, the stronger the benefits they obtain, and lecturer involvement affects information quality, which also contributes to the benefits students receive from the use of LMS.

Interestingly, reports also show that there has been evidence of resistance towards LMS adoption in Malaysia (Alias & Zainuddin, 2005; Embi, 2011). Embi (2011) reported that the challenge faced by higher learning institutions in Malaysia in relation to the utilisation of LMS is that academic staff may be too complacent about their current teaching practices, thus resulting in resistance to adopting a new LMS. He also reported that some staff might resist accepting a new LMS because of other factors such as not being well versed in IT, lack of technical support and perceptions of the system being an additional burden to existing teaching. Nevertheless, Alias and Zainudin (2005) explain the contradictory high rate of adoption evidenced in their study, as perhaps due to the fact that academic staff are "forced into adopting instructional technology innovation through directives from the (Malaysian) education ministry" (p. 27).

Human capital perspective relate to human issues, particularly the needs in determining the features of the system and human capability for future growth and sustainability of it. The literature suggested that criteria such as user satisfaction with the system, support services and facilities (Cribb & Hogan, 2003; Ruben, 1999) could be considered in the human capital perspective. Furthermore, Black et al., (2007) suggested that inadequate technical support is one of the primary reasons for failed adoption of e-learning technologies. Hence, user satisfaction, as measured by low numbers of problems reported by users, is suggested to be a measure of success of a LMS.

Gap of study

Researchers have questioned the benefits realised from IT investments in higher education including the implementation of LMS (Mott & Granata, 2006; Wier, 2004). Nevertheless, there have been some studies that address issues about LMS decision making that emphasise the importance of pre-implementation evaluation of LMS (Alias & Nik Abdul Rahman, 2005; Klobas & McGill, 2010) . However, there are very few studies done on examining the comprehensiveness of LMS evaluation methods, which are used as a set of methodologies in selecting the alternative that offers the greatest returns or benefits for the organization.

It is also deemed important to study the evaluation criteria used in LMS decision making, as this can help to address issues regarding the benefit realisation from the implementation of technology in higher education. Thus, it is important that further research is undertaken to investigate how decision makers in universities make decisions on which LMS technologies to implement, and how they justify their decisions. Most importantly, is how the decision makers ensure that the expected benefits of the implemented system are actually realised.

Therefore, there is a need to develop a model that incorporates both financial and non-financial measures particularly the Human capital perspective, as important elements of justifications. This will assist in better decision-making processes in universities, which in turn, contribute to the value realisation from IT investments. Better decisions made in deploying technologies in universities will yield a higher expected value from IT investments and contribute more effectively to the university's strategic goals.

Therefore, it is important to evaluate the criteria that are important in decision making in the human perspective to understand what can be gained or expected from the system to encourage a successful implementation.

Significance of study

This study was intended to contribute to the body of knowledge in two ways. Firstly, it was intended to increase knowledge about the practices of IT decision making in universities especially in the perspective of Human capital, thus providing insights for stakeholders in the education sector.

Secondly, this study contributes to the literature on IT decision making practices in the education sector in general, and may have implications for IT decision making more broadly. Though this study focused on the importance of Human capital perspective in the LMS implementation in universities, it may also be adapted for other industries that invest significantly in technology to create value in their business.

METHOD

Research Design

The research activities involved four phases based on the Design Research (DR) approach (Hevner, March, Park, & Ram, 2004), The first phase involved obtaining an overview of LMS decision making. The second phase involved the refinement of the initial design of the model where the criteria that are important to be included in the LMS decision making model were identified. During the third phase, a detailed design of the model was undertaken. In this phase, a set of indicators was identified for each criterion emerged from the data collection process in second phase. In the final phase, the LMS decision making model was developed and evaluated.

Semi structured interview approach was used in collecting the data. The qualitative data from the interviews were coded and analysed. A descriptive coding method using thematic analysis was used for the data coding. The qualitative data were analysed using an inductive approach where the categories of criteria and indicators were not determined before the interview.

Research Participants

The participants in this research (including both pilot and actual data collection) were five members of LMS decision-making teams at two different universities in Australia and 24

participants from different universities in Malaysia who were involved in LMS decision-making processes at their universities.

RESULTS AND DISCUSSION

1.0 Overview of the importance of Human Capital in LMS decision making

From the interviews, it emerged that it was important that the users' perspectives be examined in the pre-implementation phase. It was also seen as crucial to determine whether the implemented system could achieve the expected benefits in terms of users' satisfaction. The participants suggested that the users' needs are examined in order to ensure that the system is designed to fulfil the different needs of the students. The participants also suggested that it was important to include the users' requirements in terms of usability and flexibility of the system. They added that including an online learning tool that is designed to help staff and students with disabilities, was also a consideration. This is illustrated in the following quote:

"We look at the usability, how usable, how flexible ... how the material could be put into the system, in a way that supports any readers with a disability".

The participants explained that surveys are conducted to identify the users' expectations from the new LMS. One participant indicated that this information was obtained by a series of surveys distributed to staff and students. The participant said that the users were also asked to provide their comments on the existing LMS and whether there were any problems which they had identified with regards to the existing LMS. She said that:

"We opened surveys… what they thought about the existing one, and what are their problems (with the LMS), so that with the next one, we could ensure that the problems with the previous one won't occur".

The participant also explained that the university had involved staff and students in testing the shortlisted LMSs. The staff and students were asked to provide their comments in a questionnaire with regard to each of the different LMS alternatives.

In the interviews, it was suggested that one of the criteria that management should take into consideration in implementing a LMS in their institutions is the amount of training required. This, in turn, will be influenced by the level of technology skills and the competency of the current lecturers and staff. The following quote illustrated this kind of criterion:

"For sure for this new one, there would be really a lot of training for staff, because of the change, again it's going to be different, the interface would be different, so the staff have to orient themselves to the new interface, new source, I'm sure there's going to be a lot (of training)".

Apart from the skills and competency of the academic staff, the participants indicated that the internal capabilities of the organization in terms of technical support and development of the system was also considered to be an important criterion in LMS decision making. One participant said that the capabilities of the organization to support and develop the system should be identified, especially when considering an open source LMS as an alternative. This is illustrated in the following quote:

"There's a consideration about capabilities as well, what is the capability of your organization? Can you develop? If it's an open source, do you have the capabilities to support and develop?"

Not surprisingly, the amount of training provided to staff in ensuring sufficient skills and competency was said to be very important. One participant explained that training should be provided by the vendors to a small group of people and these people would share their knowledge and skills with other staff, thus enabling growth and sustainability in the knowledge of the technology. This would also enable the sustainability of the future growth of the system, as the skills provided to the technical staff could be used to further enhance and develop the system. The quote that supports this is as follows:

"Each of the vendors have their resources and they also do training, what they'll do is they'll come down to campus and train a small group

of people, and then those people go out and train others".

2.0 Initial design of the LMS decision making model focusing on Human Capital perspective

There were five criteria that emerged under the Human Capital perspective and they are listed in Table 1.

Table 1. Criteria that emerged under the Human Capital perspective

	Criteria
1	Enhancing lecturers' knowledge of state of the art technology
2	Increasing students' active participation in collaboration and interactive learning
3	Enhancing students' academic integrity
4.	Enhancing interaction and student engagement level in distance learning courses
5.	Enhancing technical staff expertise

The literature suggested that criteria such as user satisfaction with the system, support services and facilities (Cribb & Hogan, 2003; Ruben, 1999) could be considered in the Human Capital perspective. Black et al., (2007) suggested that inadequate technical support is one of the primary reasons for failed adoption of e-learning technologies. Hence, user satisfaction, as measured by low numbers of problems reported by users, is suggested to be a measure of success of a LMS. Nevertheless, from the data analysis, criteria that emerged under the Human Capital perspective revolved around how the system was able to impact in terms of self-enhancement, knowledge and value creation rather than the elements that could have impacts in terms of user satisfaction with the system.

User satisfaction in terms of usability, flexibility, and the way the tools are designed to fulfil the needs of people with disabilities were criteria considered important and to be included. User satisfaction is no doubt a crucial criterion in IS decision making, and this has been confirmed by researchers who promote BSC as an effective method to justify IT investment decisions (Cribb & Hogan, 2003; Ruben, 1999; Van Grembergen, 2000), and by researchers who have looked into users' needs and satisfaction in determining LMS implementation (Alias & Nik Abdul Rahman, 2005).

The level of technology skills and competencies that the instructors and staff currently have; the internal capabilities of the organization in terms of technical support and development of the system; and the amount of training provided for staff were also criteria that emerged under the Human Capital perspective. These are supported by the literature, which suggests that a continuous upgrade of IT skills of staff through training and development is essential for successful system adoption (Keyes, 2005) and that a sufficient amount of training should be provided to staff (Wainwright, Osterman, Finnerman, & Hill, 2007).

3. 0 Detailed design of the model – Human Capital perspective

In the Human Capital perspective, six criteria and a number of indicators for each criterion emerged as shown in Table 2 and are further described in the following sections.

Table 2. Criteria and indicators for the Human Capital perspective

Criteria	Indicator
Enhancing lecturers' knowledge of state of the art technology	a) Training and support services in using the software are available to lecturers on an ongoing basis b) Staff evaluation reports on the extent of the use of the technology are expected to meet or exceed minimum targets c) Student evaluation reports on the extent of enhanced features of LMS used by lecturers are expected to meet or exceed minimum targets
Increasing students' active par-	a) Ability to increase the percentage of students who participate in discussion forums and online communications

ticipation in collaboration and interactive learning	
Enhancing students' academic integrity	a) Lower rate of late assignment submission with the availability of online assignment submission features b) Lower rate of plagiarism cases with the integration of plagiarism detection software
Enhancing interaction and student engagement level in distance learning courses	a) Availability of features that can be used to enhance interaction and students' engagement in distance learning courses
Enhancing technical staff expertise	a) Number of IT staff required to attend technical workshops on this new LMS b) Frequency of technical training provided for technical support staff

3.1 Criterion 1: Enhancing lecturers' knowledge of state of the art technology

Seven participants considered that an important criterion in LMS decision making was the ability of the LMS to enhance lecturers' knowledge of the state of art technology. They were particularly concerned about the ability and willingness of academics who have been lecturing for many years to integrate technology into their teaching activities. Some of the quotations that support the emergence of this criterion are as follows:

"We would like to see the use of LMS becoming a culture in the university, especially for the older lecturers, who have become too comfortable with the face-to-face teaching method"

"At the time when we first implement the LMS, the older lecturers seemed not too happy with the idea but we tried to enhance our efforts in terms of training and tried to get higher adoption rates along the way"

"I can see that the older lecturers are the ones that always need help in using the LMS"

Five participants felt that lecturers needed to be given sufficient training to operate and utilize the system efficiently. They stressed that at their universities training sessions were compulsory and management ensured that every staff member attends the training by tracking attendance, as evidenced by the following quotes:

"We help in terms of training, we provide training for all new lecturers and lecturers who have just returned from their postgraduate studies"

"Once they attend training, they can operate the system effectively"

Four participants mentioned that their universities encourage increased LMS adoption among lecturers by including the usage of LMS features by each lecturer in their Key Performance Indicators (KPI), which is evaluated in the annual performance evaluation. Two participants stated that their university's management grant awards of excellence to lecturers for innovation and creativity in using LMS. They also support acknowledgements in the form of digital publication copyright registrations for lecturers who publish academic materials in the LMS, including lecture video-recordings. The granting of awards and acknowledgement should encourage more lecturers to produce digital publications and publish them as teaching modules in the LMS. The following quotations illustrate these points:

"Lecturers who uploaded their academic materials in the LMS should be given the copyright protection as it is very important to protect the intellectual property of the lecturers. This will also encourage lecturers to produce

more academic materials including video lectures that can be published into teaching modules"

"We include the extent of LMS adoption by lecturers as one of the evaluation criteria in the annual performance measurement. We also reward them for their creativity and active usage of the LMS."

The linking of LMS use to performance evaluations and to acknowledgements from the university is consistent with a study by Agbonlahor (2006), which tested the extent to which lecturers viewed adoption of IT as enhancing their status within the university in a developing country. His study suggested that lecturers tend to use IT more frequently when they believe their use of IT in teaching will enhance their status within the university. He suggested that the use of IT in universities can be promoted through a reward system that recognizes innovative use of IT in teaching.

Based on the comments about this criterion, the following three indicators were considered suitable to measure the criterion:

a) ***Training and support services in using the software are available to lecturers on an ongoing basis***
b) ***Staff evaluation reports on the extent of the use of the technology are expected to meet or exceed minimum targets***
c) ***Student evaluation reports on the extent of enhanced features of LMS used by lecturers are expected to meet or exceed minimum targets***
d)

3.2 Criterion 2: Increasing students' active participation in collaboration and interactive learning

Four participants asserted that it is important that the LMS implementation is able to encourage active participation in learning activities by students. The participants also felt that the online communication features in a LMS can encourage active participation in online forums and discussions, where time constraints limit this activity during lectures. They suggested that to encourage the students, their participation can be monitored and included in the course assessment. Some quotations that support the emergence of this criterion are as follows:

"They can make better preparations before classes, hence attain better understanding and actively participate while the topic is being discussed in class"

"In near future, we are moving towards Outcome Based Education (OBE), where assessment will not be based on examination only. Participation of students in online forums will also be part of the assessment computation"

"We hope that our students will use the LMS as a culture in their learning activities, where, like with Facebook, the first thing they do every morning when they wake up is check for updates on their course forums discussions"

Based on the comments about this criterion, one indicator considered suitable to measure the criterion was:

a) ***Ability to increase the percentage of students who participate in discussion forums and online communications***

3.3 Criterion 3: Enhancing students' academic integrity

During the interviews, two participants made an interesting point that LMS implementation should encourage students to be more aware of technology indirectly impacting on the quality of their assignments, with the integration of plagiarism detection software. The participants also asserted that the availability of online assignment submission features could facilitate submission processes and tracking, thus it could assist in encouraging timely submission of assignments. The ability to reduce the possibility of plagiarism and to encourage timely assignment submissions using the online assignment submission features were considered important measures in improving students' academic integrity. The following quotations support this criterion:

"Assignments can be submitted via LMS… statistics on late submissions and those who do not submit are also available"

The integration (with TurnItIn) will reduce plagiarism. If submission is done manually, the students may have the opportunity to copy other students' work."

"With the integration with plagiarism software, students will be more serious in delivering good quality assignments. Their assignments will be rejected if the system shows high percentage of plagiarism"

Based on the comments about this criterion, two indicators were considered suitable to measure the criterion:

a) Lower rate of late assignment submission with the availability of online assignment submission features
b) Lower rate of plagiarism cases with the integration of plagiarism detection software

3.4 Criterion 4: Enhancing interaction and student engagement level in distance learning courses

During the interviews, two participants indicated that it was important to consider whether the LMS implementation was able to enhance interaction and student engagement levels in distance learning courses administered by universities. Although there were only two participants who emphasised this criterion, it was felt that it was essential considering that LMS usage in distance learning programs has become "especially important as a means of offering highly interactive and widely accessible learning solutions" (Venter, Jansen van Rensburg, & Davis, 2012, p. 183).

In Malaysia, the MOHE has designated three institutions as Open and Distance Learning (ODL) - mode institutions (Open University Malaysia (OUM), Wawasan Open University (WOU) and Asia-e University (AeU)). The MOHE also encourages other public and private universities to offer their own distance learning programmes (Bahroom & Latif, 2012). Distance education programmes in Malaysian universities are offered as initiatives to provide education opportunities for working adults who remain in full-time employment. These initiatives are seen to help achieve the MOHE's strategic objective on enculturation of lifelong learning (Guan, Latifah, & Ramli, 2011).

In line with this, the participants asserted that the use of the online communication tools in the LMS could enhance the communication between students and lecturers at universities that offer distance learning courses. Therefore, the use of LMS should be incorporated in all distance learning courses.

"If distance learning courses are offered fully online, there should be a likelihood of a full-scale adoption and implementation of the LMS … this applies to our distance learning programs"

"We have an undergraduate course to be offered … this course will be conducted fully online using our LMS. So now, our lecturers are going for training to use the tools in the LMS especially the 2.0 tools which are needed for the means of communications with students in the distance learning program"

The comments suggest that it is important to assess the ability of the LMS to enhance interaction and student engagement in distance learning programs and hence the following indicator was used:

a) Availability of features that can be used to enhance interaction and students' engagement in distance learning courses

3.5 Criterion 5: Enhancing technical staff expertise

Eight participants pointed out that one important criterion to consider when choosing between LMS alternatives, especially when considering open source system alternatives, was the availability and competency of IT technical expertise to support the development and the maintenance of the software. For example:

"We have to ask ourselves firstly, are our staff competent enough to support the software for our users, and secondly, do we have enough staff to support the system, as you know, when it's a free software, we have to do the development and testing ourselves"

The participants felt that it is important to consider whether management could retain and manage technical experts' knowledge. This is to ensure that the technical staffs are able to keep up with the ever-increasing developments in technology and therefore, able to provide excellent technical support for users, as illustrated in the following quotes:

"The expertise in the technology must be retained in the university, or if you can't maintain the people, their knowledge must be at least transferred to the successor."

"We hope that the vendor can transfer the technical knowledge to our staff so that we can handle the system ourselves in the long term"

"We have our own expertise, but then there is another issue, the risk of not being able to retain the people"

One of the participants stressed that lack of availability of staff and inability of staff to solve technical problems can contribute to implementation failure.

"It is important to maintain people who monitor the system. What I can see as one of the limitations is that the IT department has only one or two people who manage the LMS. When that person is not around, who will maintain the system? When a temporary substitute officer takes his/her place, he/she doesn't know much about IT (LMS)…these are technical things that call for attention, even if it looks minor, it has to be managed otherwise this will contribute to failure or limitation of the system implementation."

Based on the comments about this criterion, the following two indicators were used:

a) Number of IT staff required to attend technical workshops on this new LMS
b) Frequency of technical training provided for technical support staff

CONCLUSION

From the results of this study, decision makers suggested that lecturers' knowledge of the enhanced features in the LMS technology was essential for them to optimally utilize the technology in their teaching. The amount of training provided was seen as an indicator to measure the degree of knowledge required by lecturers in order to efficiently utilize the LMS. Some universities have made training compulsory for all lecturers and training session attendance is monitored by management. Overall, decision makers considered it important to assess the ability of the LMS to assist in enhancing IT knowledge among lecturers. This was considered valuable so that lecturers have the skills to utilize the technology and realise its full potential. This view is consistent with past research which argued that the IT knowledge and skills of lecturers is important in order to effectively deliver online course components and support student communication in a technology enhanced learning environment (Shannon & Doube, 2003).

The decision makers felt that a criterion that measures the knowledge and skills of the IT technical support staff should be included in the LMS decision making model. This was felt to be crucial to enable the future development and maintenance of the system, as the technical skills provided to the technical staff could be used to further enhance and develop the LMS. This is consistent with the literature which suggests that a continuous upgrade of the IT skills of staff through training and development is essential for successful system adoption (Keyes, 2005; Wainwright, et al., 2007).

Interestingly, the criteria considered important by decision makers with regard to the Human Capital perspective did not only revolve around skills and knowledge enhancement of lecturers and support staff, but also concerned students. Students' participation in collaboration and interactive learning, their academic integrity (as a result of using enhanced technology in learning, particularly anti-plagiarism software integrated with a LMS); and the level of students' interaction and engagement in distance learning courses, were all considered to be important criteria in LMS decision making. These findings are consistent with research conducted by Venter, Jansen van Rensburg, and Davis (2012) who examined the drivers of LMS use in a South African open and distance learning institution. They found that the ability

of students to obtain various benefits was important, as they are the ultimate users of the LMS and are an important stakeholder in the university.

REFERENCES

Agbonlahor, R. O. (2006). Motivation for use of information technology by university faculty: A developing country perspective. *Information development, 22*(4), 263-277.

Al-Ajlan, A. S. (2012). A comparative study between e learning features, methodologies, tools, and new developments for e learning. In D. E. Pontes (Ed.), *Information system Management college of Business and Economics Qassim University Kingdom of Saudi Arabia* (pp. 191-214): Intech.

Alias, N. A., & Nik Abdul Rahman, N. S. (2005). The supportive distance learning environment: A study on the learning support needs of Malaysian online learners. *The European Journal of Open, Distance and E-Learning, 2005*(2). Retrieved from http://www.eurodl.org

Alias, N. A., & Zainuddin, A. M. (2005). Innovation for better teaching and learning: Adopting the learning management system. *Malaysian Online Journal of Instructional Technology, 2*(2), 27-40.

Bahroom, R., & Latif, L. A. (2012). Open and distance learning as the key driver of lifelong learning. *Proceedings of the National Conference on Lifelong Learning (22-23 September 2012)*. Kuala Lumpur: Malaysian Ministry of Higher Education

Basir, H. M., Ahmad, A., & Noor, N. L. M. (2010). Strategic management of e-learning implementation programme in Malaysian public universities issues on policy and key initiatives. *Proceedings of the International Conference on Science and Social Research (CSSR) (5-7 December, 2010)* (pp. 1143-1148). Kuala Lumpur, Malaysia: IEEE.

Black, E. W., Beck, D., Dawson, K., Jinks, S., & DiPietro, M. (2007). Considering implementation and use in the adoption of an LMS in online and blended learning environments. *TechTrends, 51*(2), 35-39.

Cavus, N., & Zabadi, T. (2014). A Comparison of Open Source Learning Management Systems. *Procedia-Social and Behavioral Sciences, 143*, 521-526.

Chua, B. B., & Dyson, L. E. (2004). Applying the ISO 9126 model to the evaluation of an elearning system. In R. Atkinson, C. McBeath, D. Jonas-Dwyer & R. Phillips (Eds.), *Beyond the Comfort Zone: Proceedings of the 21st ASCILITE Conference (5-8 December 2004)* (pp. 184-190). Perth, Western Australia.

Coates, H. (2006). *Student engagement in campus-based and online education*. London: Routledge.

Cribb, G., & Hogan, C. (2003). Balanced Scorecard: linking strategic planning to measurement and communication. *Proceeding for Conference of Information Services (June 2003)*. Gold Coast, Queensland: Bond University.

Embi, M. A. (2011). e-Learning in Malaysian institutions of higher learning: Status, trends and challenges. *Proceedings of the International Conference on Lifelong Learning (ICLLL 2011) (14-15 November, 2011)*. Kuala Lumpur: Open University Malaysia, Kuala Lumpur.

Guan, E. C., Latifah, A. L., & Ramli, B. (2011). Enculturation of lifelong learning: perspectives from the New Economics Model. *Proceedings of the International Conference on Lifelong Learning (ICLLL 2011) (14-15 November, 2011)*. Kuala Lumpur: Open University Malaysia, Kuala Lumpur.

Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design Science in Information Systems Research. *MIS Quarterly, 28*(1), 75-105.

Jenkins, M., Browne, T., Walker, R., & Hewitt, R. (2011). The development of technology enhanced learning: findings from a 2008 survey of UK higher education institutions. *Interactive Learning Environments, 19*(5), 447-465.

Kaplan, R., & Norton, D. P. (1993). Putting the balanced scorecard to work. *Harvard Business Review, 71*(5), 134 - 142.

Keyes, J. (2005). *Implementing the IT balanced scorecard: Aligning IT with corporate strategy*. Boca Raton, Florida: Auerbach Publications.

Khairudin, N., & Hamid, M. N. A. (2015). The Development of a LMS Decision Making Model: Evaluating the Importance of Non-Financial Measures in LMS Decision Making at Universities.

Kinkle, L. M. (2010). *A case study of the University of Mississippi and its response to the growth of online institutions.* Doctor of Philosophy Thesis presented for the Degree Doctor of Philosophy, Capella University. Retrieved from ProQuest LLC

Klobas, J. E., & McGill, T. J. (2010). The role of involvement in learning management system success. *Journal of Computing in Higher Education, 22*(2), 114-134.

Laurillard, D. (2007). Modelling benefit-oriented costs for technology enhanced learning. *Higher Education, 2007*(54), 21-39.

Lewis, B., MacEntee, V., & Youngs-Maher, P. (2002). Software compare and contrast: Blackboard, WebCT and Lotus Notes a panel discussion *Proceedings of the 2005 Informing Science and IT Education Joint Conference (June 16-19 2002)*. Flagstaff, Arizona, USA.

Lonn, S., & Teasley, S. (2009). Saving time or innovating practice: Investigating perceptions and uses of Learning Management Systems. *Computers & Education, 53*(3), 686-694.

Mott, J., & Granata, G. (2006). The value of teaching and learning technology: Beyond ROI. *EDUCAUSE Quarterly, 29*(2), 48-54.

OECD. (2005). E-learning in tertiary education: where do we stand? , from http://www.oecd.org/document/56/0,2340,en_2649_37455_34900984_1_1_1_37455,00.html

Ramayah, T., Ahmad, N. H., & Lo, M. C. (2010). The role of quality factors in intention to continue using an e-learning system in Malaysia. *Procedia Social and Behavioral Sciences, 2 (2010),* 5422-5426.

Ruben, B. D. (1999). Toward a balanced scorecard for higher education: rethinking the college and university excellence indicators framework. *Higher Education Forum, 99*(2), 1-10.

Shannon, S. J., & Doube, L. A. (2003). Factors influencing the adoption and use of web-supported teaching by academic staff at the University of Adelaide. *Proceedings of the ASCILITE 2003*. Melbourne, Australia.

Van Grembergen, W. (2000). The balanced scorecard and IT governance. *Information Systems Control Journal, 2*(1), 40-43.

Venter, P., Jansen van Rensburg, M., & Davis, A. (2012). Drivers of learning management system use in a South African open and distance learning institution. *Australasian Journal of Educational Technology, 28*(2), 183-198.

Wainwright, K., Osterman, M., Finnerman, C., & Hill, B. (2007). Traversing the LMS terrain. *Proceedings of the 35th annual ACM SIGUCCS - Conference on User Services (7-10 October 2007)* (pp. 355-359). New York: ACM Press.