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EFFICIENCY OF LMS (LEARNER MANAGEMENT SYSTEMS) IN INSTITUTIONS OF UZBEKISTAN AND SUGGESTIONS FOR FURTHER DEVELOPMENT

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Abstract - Many universities around the globe implemented different LMSs (Learning Management Systems) to provide online education for their students. However, the pandemic has put not only the universities, but also educational institutions and schools under pressure. In this study, we questioned the efficiency of the LMSs and the experiences of students from two universities implementing two different LMSs – Moodle and Canvas.

Keywords— LMS, Efficiency, Moodle, Canvas

I. INTRODUCTION

Rapid developments in communication and information technologies and COVID-19 have compelled many education institutions and universities to be diverted into distance education programs that help students continue studying during pandemic. However, there is a need for a platform that allows the teaching processes to be managed from a center in existing distance education programs. This need is satisfied by learning management systems (LMS).

LMS is a server-based software program that interfaces with a database containing information about users, courses and content. A LMS provides a place for learning and teaching to occur within an integrated environment (Ullman C. & Rabinowitz M., 2004). These systems allow educational institutions to offer a larger number of full online or blended/hybrid (partly online and partly face-to-face) courses. Face-to-face courses that use a LMS to supplement activities are often referred to as web-enhanced courses (Schmidt, K., 2002). LMSs are known in the literature by several different names, including course management system, virtual learning environments and e-learning courseware (Gibbons S., 2005). The LMS software interact with instructors, learners, and training materials, thanks to technological infrastructures.

Educational activity in the virtual environment is the result of this interaction being achieved in a positive and efficient manner. LMS provide some functions such as presenting learning materials, sharing and discussing presented learning materials, managing course catalogs, taking assignments, entering exams, providing feedback on these assignments and exams, organizing learning materials, keeping students, instructors, and system records (D. Jovanovic and S. Jovanovic, 2015).

In addition to these functions, it has been shown that LMS software has some disadvantages of not being able to establish active communication with students as in traditional education (S. Duo and L. X Song, 2012). As noted by Duncan and Young (H. E. Duncan and L. X. Song, 2009), Güler et al. (M. D. Güler, E. Tekinarslan, and N. Yavuzalp, 2016), and Mclean (J. McLean, 2006), lack of personal face-to-face communication in online learning environments affects students negatively. Consequently, students lose their confidence and interest in the learning environment because their problems are not solved on time. It has also shown that implementing LMS requires a well-built infrastructure. It's up to the teachers to adapt their curricula from face-to-face lectures to online lessons. (Schoonenboom, Judith, 2014)

For this reason, it is considered that the efficiency of LMS and student satisfaction are essential to be assessed before the implementation of LMS in universities and schools. The focus of this study was to investigate the efficiency of an LMS in the teaching and learning of three educational institutions, with emphasis on the satisfaction and experiences of learners in relation to implementation of the LMS as a suitable substitute for traditional classroom teaching during pandemic.

II. RESEARCH DESIGN AND METHODOLOGY

This study employed quantitative method which involves collecting numerical data which can be counted (Mouton, J., & Marais, H.C., 1994). Quantitative data collection methods

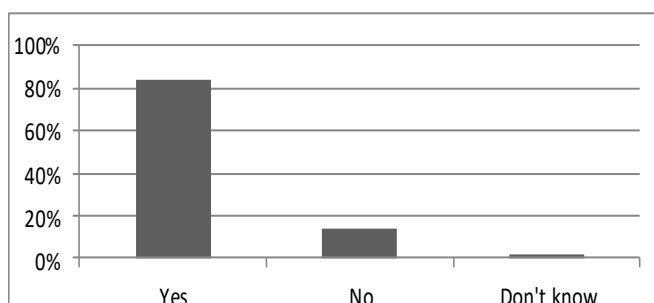


Fig. 1. Can you access internet on your phone?

make use of a limited range of predetermined responses whereby the experiences and perceptions of people can be measured. This approach was used to analyse the data from the electronic survey (e-survey).

The electronic survey (e-survey) methodology was used because we wanted to reach out to more respondents in a short time without the need to travel. However, there are some concerns on the effectiveness of e-surveys, which include: access to and familiarity with technology (Thompson, L.F., Surface, E.A., Martin, D.L. and Sanders, M.G., 2003); how to include incentives for completion (Couper, M.P., 2000); response quality (Couper, M.P., Traugott, M. and Lamias, M., 2001); invasion of privacy (Gurau, C., 2007); and low response rates (Kaplowitz, M.D., Hadlock, T.D. and Levine, R., 2004). In this study, the shortcomings due to such concerns were minimized by the fact that: the survey respondents were university students who were familiar with and had access to technology; no incentives were to be offered to the respondents; and the intent of the survey was well outlined in the introduction, creating a high perceived importance of the study to the respondents so as to provide genuine responses.

The study was conducted in two universities, implementing two of the most popular open source LMSs – Moodle and Canvas. The university was selected for this study first for convenience reasons; having carried out a closely related research meant that we had established contacts in university, which would benefit this study. It is also important that economic advancement of tourism industry and investment prospects have a tremendous effect on the developing country's universities and institutions which could implement such platforms. (Firdavs Saliev, Mukhammadkhon Soliev, 2015) (Mukhammadkhon Soliev, 2020)

An electronic questionnaire was sent out to students in the two universities. The invitation to participate in the survey was sent to students' e-mail lists and in some cases directly to individual students' e-mail addresses by the principal investigator. The potential respondents were identified with the help of contact persons, who were faculty staff in the participating universities. Upon sending out the invitation to

the students, announcements were also sent to them so as to avoid them treating the invitation to participate in the survey as spam e-mail.

The e-survey questionnaire was powered by LimeSurvey, an open source survey application. The questionnaire consisted of four sections. Section 1 focused on student's comfort level with information technology in general. Section 2 focused on the students' prior experience with. Section 3 had questions that required the student to rate the different LMS access devices, to score the importance of the various LMS services and to select the most desirable LMS services to them.

Although the study targeted about 100 respondents (50 respondents from each University), a total of 86 valid submissions were obtained, indicating a response rate of 86 percent. The distribution of the respondents over the different participating universities were 46 (University 1) and 40 (University 2).

III. SURVEY FINDINGS AND INTERPRETATIONS

Almost all of the LMSs require the internet connection, so we decided to ask students whether they can go on the internet when it is needed. Clearly, the majority of the students can access the internet at certain times (Figure 1). According to the graph, almost 85 percent of the students can access the internet when needed. By contrast, only 14 percent of them indicated that they cannot access the internet and the remaining percentage was for the students who did not actually know if they can access the internet in the im mobile phones or laptops.

Asked to rate themselves on their comfort levels using technology and technology applications, 91 percent said they were comfortable and 73 percent of them was very comfortable. On the other hand, only 1 percent said they were very uncomfortable (Figure 2). Compared to the preceding researches, the figures indicate that the students' computer literacy skills have improved considerably.

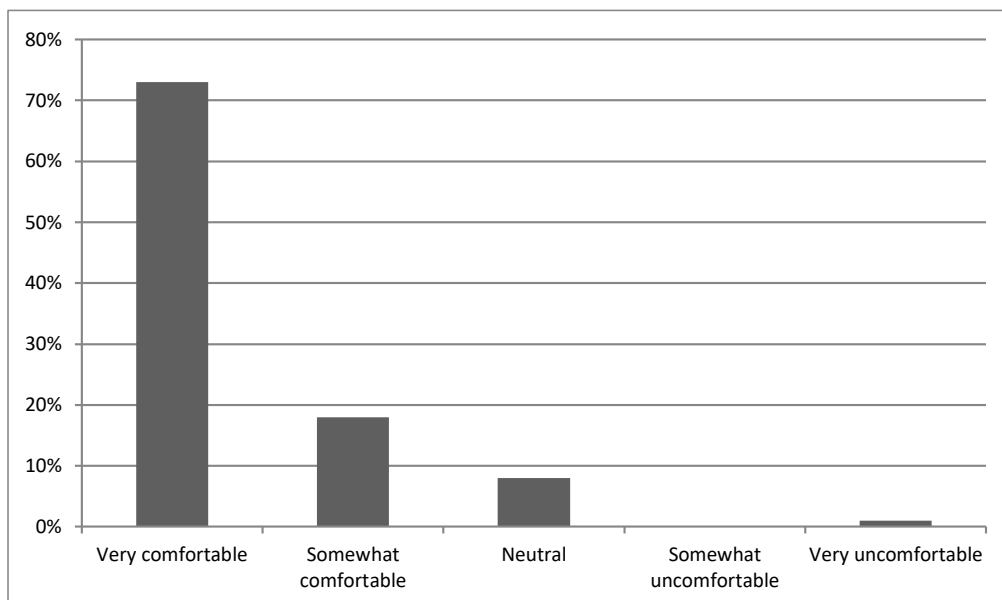


Fig. 2. Students' comfort level using technology and technology applications

We also asked questions with respect to their experience with LMSs on a five-point scale (1 – highly experienced; 2 – somewhat experienced; 3 – neutral; 4 – somewhat inexperienced; 5 – struggling). Overall, students rated themselves as shown in Figure 3. The figures for students who were either highly or somewhat experienced were approximately 80%, whereas only about 3% of the students reported that they were still struggling to use LMS.

However, as might have been expected, the variation between the students' experiences with LMSs at the different universities was quite significant, demonstrating the fact that universities and students vary in their use of the technology. Furthermore, it may come down to the type of LMS that the

universities are using. For example, while the majority of students using CANVAS from University 2 reported high experience, the majority of their counterparts using MOODLE from University 1 reported lower experiences. Table I shows how the students rated themselves on their experience using LMSs. As seen from the table, almost 60 percent of the students from University 1 claimed that they are experienced and only about 10 percent of that figure was for highly experienced students. By contrast, 56 percent of the students studying at University 2 regard themselves as highly experienced. It should also be noted that all students either somewhat inexperienced or struggling are from University 1 which has employed the LMS – Moodle.

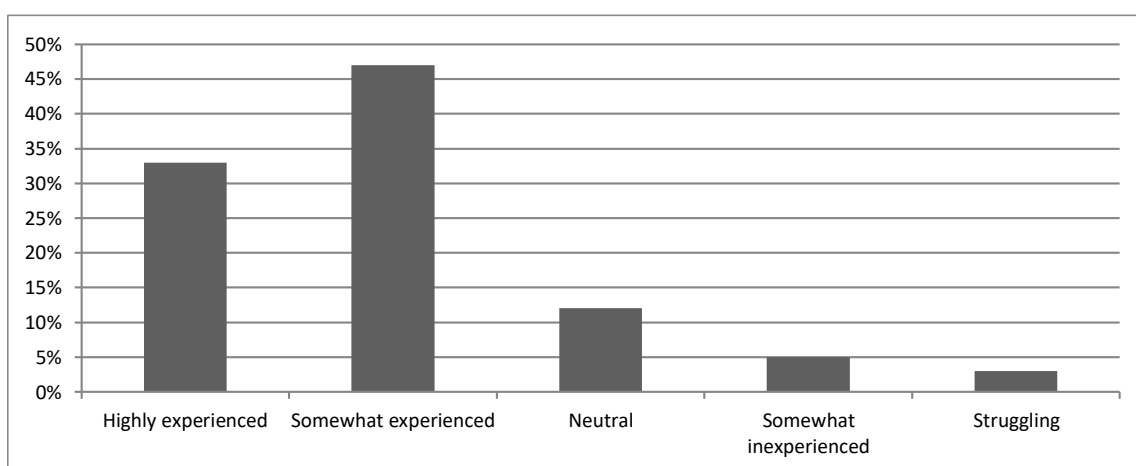


Fig. 3. Students' experiences with LMSs

Table 1. Differences in experiences with LMSs between students at different universities

	Highly experienced (%)	Somewhat experienced (%)	Neutral (%)	Somewhat inexperienced (%)	Struggling (%)
University 1	9	50	25	11	5
University 2	56	38	6	0	0

Table 2. How the students rated the need and desire of the different LMS services

Service	Respondents who selected service as frequently used-needed		Respondents who strongly agree that the service is desirable		Average of "need" and "desire"
	Number	Percentage	Number	Percentage	
Assignments	78	91	81	94	92
Announcements	64	74	76	88	81
Resources	62	72	76	88	80
Course outlines	49	57	63	73	65
Chat room	47	55	61	71	63
Slides	46	53	62	72	63
Calendar	48	56	58	67	62
Tests and quizzes	47	55	57	66	60
Dropbox/file exchange	42	49	58	67	58
Discussion forums	46	53	52	60	57
Participants/groups	41	48	55	64	56
Search	38	44	54	63	53
Messages	39	45	53	62	53
Q&A	31	36	51	59	48
Email archive	34	40	36	42	41
News/RSS feeds	22	26	25	29	27
Wikis	22	26	23	27	26
Blogs	16	19	22	26	22
Polls	16	19	20	23	21
Podcasts	9	10	21	24	17

In terms of services, we tried to distinguish between needed services (those that the students are required to access most of the time) and desired services (those that students like the most). Table II shows how the students rated the need and It can be seen that the three services with the highest average score are Assignments, Announcements and Resources. Assignments turn out to be both the most needed (91%) and the most desired (94%) service among the students. There are five services with the average percentage below 30% and they should definitely be eliminated or upgraded.

desire of the different LMS services. The services with the highest average score are the most needed and desired LMS services by the students.

In addition to the LMS services presented to the students for selection, the students were also asked to write down any other LMS services that are important them, or which they would like the LMS to provide. The following were mentioned: grade book; assignment submission; video lectures/tutorials; video forums/videoconferencing; automatic marker; eCards

for exams, graduation, etc.; notification of important deadlines; picture blog; receiving results and tutorial Signups.

altogether. This will make the platform more simple and user-friendly both for students and teachers.

IV. CONCLUSION AND FURTHER SUGGESTIONS

The bottom line is that the majority of the students surveyed shown that they are more interested in using technological devices while studying and their computer literacy skills have risen dramatically over the last decade. Now they have all the equipment and facilities to access the internet which allows them to continue their education during the pandemic.

However, this study also identified the services that are most desired and needed by the students in the surveyed universities, which if the LMS is to be used as a substitute to classroom teaching, they have to be given priority. These include: assignments, announcements, resources, course outlines and chat rooms. These services however may vary for the different institutions/universities depending on the context in which the LMS is used and the needs for the various stakeholders especially the students. On the other hand, there are some services which students are not required to use at all and they did not know how to use. Those services should be eliminated from the LMSs in order to improve productivity and efficiency of the LMSs.

Meanwhile, there was a clear difference between the two LMSs implemented by two different universities. The LMS called Moodle was considered complex for some students, while students using LMS called Canvas reported that the platform was user-friendly and responsive in terms of resolution. Which means that students could use the LMS in their phones while they do not have an access to their Laptops or PCs. Students using Moodle, on the other hand, reported that there were many functions which they do not understand how to use and directly affected their concentration.

Analysing all the data gathered and paying close attention to the students' preferences, we put forward some suggestions which may be worthwhile in the process of employing the LMS in schools and other institutions during the outbreak where it has not been implemented yet.

As seen from the survey results, most of the services offered by two LMSs are not used at all and can be excluded. But, there are many services like assignments, announcements, resources, course outlines and chat rooms which should be added to help students.

Furthermore, Moodle seems a bit complicated to students and have more than enough services offered. Some of them could be prioritised while other services should be eliminated

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