The Importance of LMS Use Policy in Higher Education Institutions

Yükseköğretim Kurumlarında ÖYS Kullanım Politikasının Önemi

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Abstract

The shape of education is changing on a daily basis with the technological advances. This change is especially necessary to accommodate digital natives in Higher Education Institutions. Today, Learning Management Systems which provide more convenient way of learning and teaching are commonly used in education. Although many institutions utilize such systems, some instructors are still reluctant to integrate this technology into their teaching. Institutional technology policy is one of the factors that have been found to have an influence on the dissemination of technology use in institutions. Therefore, the aim of this study is to examine the impact of institutional policy on dissemination of technology by analysing Learning Management System activities of students and instructors. In the first part of the analysis before and after institutional policy change Learning Management Systems activity data of instructors are utilized. SPSS is used to analyse the relationship between pre- and post-policy change according to faculties. Paired Sample T-Test is used in the second part of the analysis to analyse if there is a statistically significant difference between the pre- and post-policy change on students and instructors use of Learning Management Systems. The findings of this study show that the change in policy does not have any impact on the active use of Learning Management System by students and instructors. Considering these findings, this study highlights the importance of effective policy implementation and dissemination in order to increase Learning Management System based activities in Higher Education Institutions. It is clearly known that the integration of technology into education increases student engagement and performance therefore, this study underlines the importance of an effective policy implementation in higher education institutions.

Keywords: *Institutional LMS policy, Learning Management Systems, Technology Dissemination, Higher Education*

Öz

Teknolojik gelişmeler ile eğitimin şekli her gün değişiyor. Bu değişim, özellikle Yüksek Öğrenim Kurumlarında dijital yerlilerin yerleştirilmesi için gereklidir. Günümüzde, öğrenim ve öğretimin daha

uygun bir yolunu sağlayan Öğrenme Yönetim Sistemleri yaygın olarak eğitimde kullanılmaktadır. Her ne kadar birçok kurum bu sistemleri kullanıyor olsa da, bazı eğitmenler bu teknolojiyi öğretilerine entegre etmek konusunda hala direnç göstermektedir. Kurumsal teknoloji politikası, kurumlarda teknoloji kullanımının yaygınlaştırılmasında etkili olduğu görülen faktörlerden biridir. Bu nedenle, bu çalışmanın amacı, öğrencilerin ve öğretim elemanlarının Öğrenme Yönetim Sistemi aktivitelerini analiz ederek, kurumsal politikanın teknoloji yayılımı üzerindeki etkisini incelemektir. Analizin ilk bölümünde kurumsal politika değişiminden önce ve sonra eğitmenlerin Öğrenme Yönetim Sistemleri etkinlik verileri kullanılmıştır. Fakültelere göre politika öncesi ve sonrası değişim arasındaki ilişkiyi analiz etmek için SPSS kullanılmıştır. Öğrencilerin ve öğretim elemanlarının Öğrenme Yönetim Sistemlerinin kullanımındaki politika öncesi ve sonrası değişimler arasında istatistiksel olarak anlamlı bir fark olup olmadığını analiz etmek için analizin ikinci bölümünde Bağımlı Örneklem t-Testi kullanılmıştır. Bu çalışmanın bulguları, teknoloji kullanım politikasındaki değişimin öğrencilerin ve öğretim elemanlarının Öğrenme Yönetim Sisteminin aktif kullanımı üzerinde herhangi bir etkiye sahip olmadığını göstermektedir. Bu bulgular göz önünde bulundurulduğunda, bu çalışma, Yükseköğretim Kurumlarında Öğrenme Yönetim Sistemi temelli etkinlikleri artırmak için etkili politika uygulama ve yaygınlaştırmanın önemini vurgulamaktadır. Teknolojinin eğitime entegrasyonunun öğrenci katılımını ve performansını artırdığı açıkça bilinmektedir, dolayısıyla bu çalışma yüksek öğretim kurumlarında etkili bir teknoloji kullanım politika uygulamasının önemini vurgulamaktadır.

Anahtar sözcükler: *Kurumsal ÖYS politikası, Öğrenme Yönetim Sistemleri, Teknoloji Yaygınlaştırma, Yüksek Öğretim*

Introduction

The use of technology has brought multiple advents to education such as digital learning (Kaplan & Haenlein, 2016); the process of learning via the use of digital media, which has allowed education to be more vibrant. Learning Management Systems (LMS) is one of these advents which integrates tools for collaboration, interaction, online course delivery as well as reporting and tracking of student activities (Rhode, Richter, Gowen, Miller, & Wills, 2017). Such systems have become very popular over the years in most institutions (Nkomo & Nat, 2016; Rhode et al., 2017). However, some higher education institutions who have implemented LMSs do not make the most out of these systems (Mtebe, 2015). This may be due to several factors including the policies implemented by the institution, as it has been found that administrators' policies have an effect on the use of LMS by instructors (Nasser, Ramzi. Cherif, Maha. Romanowski, 2011; Zheng, Wang, Doll, Deng, & Williams, 2018).

Today, students who are deemed as more technologically able in comparison to previous generations are enrolling more and more into universities (Sarkar, Ford, & Manzo, 2017), and it is important to change the process of teaching and learning to accommodate them (Šorgo, Bartol, Dolničar, & Boh Podgornik, 2017). It is also vital to keep these students engaged in

their learning through the use of technology to keep them motivated and thus reduce dropout rates as well as improve their learning achievements (Sarkar et al., 2017).

The aim of this paper is to analyse the impact of policy implementation on technology dissemination (which is the way innovations are transferred from initiator to receiver), particularly LMS in a higher education institution. It is important to conduct this research in order to justify the importance of an effective policy implementation in order to allow easy technology dissemination. This will be achieved by answering the following research questions:

1. Is there a statistically significant difference among the instructors LMS usage before and after LMS policy change?
2. Is there a statistically significant difference in course access before and after LMS policy change?

The rest of the paper will cover the literature about technology policy influence on LMS usage, discuss the data obtained and used in the Chi Square and Paired Sample T-Test. In addition, this study will analyse the results of the statistical tests applied as well as provide conclusions and recommendations based on these results.

Literature Review

LMSs are one of the key technologies being used in higher education and have been found to be fundamental to academic institutions. LMSs such as Moodle, Blackboard and Desire2learn are used by faculty members mainly to administer their course content (Zheng et al., 2018). Such systems are normally provide collaborative environments that are student focused, and eliminate space and time boundaries provided by traditional education (Sánchez & Hueros, 2010). LMSs also generate multitudes of data and all user actions are stored to support the administration of the system. The potential in LMS is huge for higher education institutions since it has impact on student retention as well as learning achievements (Bervell & Umar, 2017). It also helps in managing large student groups and supporting advents such as distance learning (Zheng et al., 2018).

When it comes to measure LMS success, different thresholds have been provided such as self-efficacy, student satisfaction and usage as an unused system is a failed system (Mtebe, 2015). However, there are still some issues with the acceptance of LMS by students and instructors (Bervell & Umar, 2017) and these thresholds help to identify these issues. Institutional technology policy has been found to have an influence on the use of LMS by instructors which in turn influences student use (Nasser, Ramzi. Cherif, Maha. Romanowski, 2011; Zheng et al., 2018). When organizations support the use of technology, this leads to empowered employees

which will benefit the organisation. Similarly, organisation support is important for LMS adoption in teaching by faculty members (Zheng et al., 2018). Some of the issues related to lack of LMS usage are instructor's attitudes, infrastructure reliability, lack of technical support, as well as lack of training (Nasser, Ramzi. Cherif, Maha. Romanowski, 2011) . According to Bagarukayo and Kalema (2015) lack of institutional support, lack of skilled instructors, access issues as well as infrastructure issues are challenges to eLearning adoption. King and Boyatt, (2015) outline staff attitudes and skills, institutional infrastructure, as well as institutional strategy that provide enough resources and guidance for effective implementation of technology as some of the factors that influence e-learning adoption in higher education. Blackwell, Lauricella and Wartella (2014) analyse factors influencing the use of digital technologies in early childhood education. Although the level of education is different the factors remain similar; attitudes toward the technology, instructor confidence to use technology as well as support and technology policy. Ismail (2016) outlines that an effective adoption of ICT in education institutions should include all stakeholders in order to fully understand the needs of the users. According to Ismail (2016) instructors have an impact on students' use of LMS and training on the use of technologies may help instructors overcome their psychological issues that prevent them from using LMS.

All of the aforementioned challenges are the issues that could be addressed in an Institutional technology policy. Therefore, it is vital for Higher Education Institutions to structure themselves in a way that enhances the use of technology. A shift away from technology driven user interfaces as being the main providers of value in end user computing is noted, and therefore institutions are the key in this regard to providing value to the end user (Zheng et al., 2018). This institutional support should therefore be clearly defined in order to support faculty members; as well as students and this should be defined in the form of a policy. The policy should provide guidelines with regards to the access and usage of the technology as well as infrastructure provided by the institution. This will guide users to effectively and efficiently use LMS (Mtebe, 2015). Other ways to improve LMS usage as noted by Mtebe (2015) include increasing awareness of LMS, as well as enhancing support services, which are traits that can be included as part of a sound policy. The management of higher education institutions should also allocate funds towards the infrastructure and development of user skills through training sessions (Bervell & Umar, 2017).

Methodology

In this study, data obtained from the Moodle LMS at a developing higher education institution is used. The data used was based on the number of active instructors as well as course access data from 581 courses during the fall semesters 16-17 and 17-18 before and after the policy change respectively. Active usage of a course entailed the course having learning materials that could be uploaded at any time by instructors and accessed by students. In the period preceding the change the institution already had an existing policy on the usage of educational technologies such as LMS. While the previous policy was in effect, the university LMS was still being used, however it was not being used to its full potential, thus an upgraded policy was derived. The new policy included elements such as providing training for instructors at the beginning of every semester. These training sessions also provided information on the benefits of using LMS in the teaching and learning process as the new policy also provided staff dedicated for providing technical support. These additions made the system easily available and accessible to everyone at the institution. All the aforementioned correspond with the literature (see Bagarukayo & Kalema, 2015; King & Boyatt, 2015; Nasser, Ramzi. Cherif, Maha. Romanowski, 2011) above as being some of the factors that influence LMS usage and can be rectified through a well implemented policy. In order to understand if the policy changes had any implication on the usage of the Moodle LMS at the HEI, the study used the Statistical Package for the Social Sciences (SPSS) to analyse the data that was collected in fall semesters before and after the policy change. First the Chi-Square test was used to find the associations between instructor usage of LMS before and after the policy changes. Next the Paired Sample T-Test was utilized to analyse if there was a significant difference in instructor and student usage of LMS before and after the policy change.

Results & Discussions

The Chi-square test was employed to investigate whether there is a significant difference in the instructors' active usage of LMS before and after the policy. The investigation involved a 2x13 design with 2 tests (pre-policy change and post-policy change) and the thirteen faculties. Table 1 shows the 2x13 contingency table displaying the actual and expected counts in addition to within policy and within faculty percentages of the distribution. In the pre-policy change, 53 instructors were found in the Engineering faculty with count expected 52.3, whereas, in the post-policy change 63 instructors were found with 63.7 expected. For the Economics and Administrative Sciences faculty, 26 instructors used Moodle pre- and post-policy change with an expected count of 23.4 and 28.6 respectively. For the faculty of Fine Arts, Design and Architecture the pre-policy change usage was 19 with an expected count of 18.5, whilst in the

post-policy, there were 22 instructors with an expected count of 22.5. For the Arts and Sciences faculty, 13 instructors were actively using Moodle with expected count 17.6, whereas, 26 instructors used Moodle actively post-policy change with an expected count of 21.4. For the Faculty of Health Sciences, 10 instructors used Moodle actively pre-policy change with expected count of 12.6, while, 18 instructors used Moodle post-policy change with expected count of 15.4. For the Education faculty, 10 instructors were active pre- and post-policy change with expected count of 9.3 and 11 respectively.

In addition, for the Law faculty, 6 instructors were active pre-policy change with 6.8 expected count whilst 9 instructors with 8.2 expected count were active post-policy change. For the School of Applied Sciences, 9 instructors were active pre- and post-policy change with an expected count of 8.1 and 9.9 respectively. Furthermore, for the communication faculty, 10 instructors were active pre-policy change with 8.1 expected count whilst 8 instructors with 9.9 expected count were active post-policy change. In the faculty of Pharmacy, 6 instructors were active pre-policy and post-policy change with an expected count of 5.4 and 6.6 respectively. For the School of Foreign Languages, 3 instructors were active pre-policy change with an expected count of 4.1, whilst post-policy change, there were 6 active instructors with an expected count of 4.9. For the faculty of Agricultural Sciences and Technologies, 5 instructors were actively using Moodle with expected count of 4.1, pre-policy change, whereas, 4 instructors were active post-policy change with 4.9 expected count. Finally in the school of Tourism and Hospitality, 3 instructors were active for pre-policy change with an expected count of 3.2 whilst 4 of them were active post-policy change with an expected count of 3.0. These results suggested that there were differences in instructor's active usage of LMS between the before and after policy change. However, it is important to find out whether a statistically significant difference exits among the use of the LMS pre- and post-policy change similar to (Armah, Cofie, & Okpoti, 2018).

Table 1: Cross Tabulation of the faculty and policy analysis

Faculty/School		Pre-policy	Post-policy
Engineering	Count	53	63
	Expected Count	52.3	63.7
	% within Faculty	45.7%	54.3%
	% within Policy	30.6%	29.9%
Economics and Administrative Sciences	Count	26	26
	Expected Count	23.4	28.6
	% within Faculty	50.0%	50.0%
	% within Policy	15.0%	12.3%

Fine Arts, Design and Architecture	Count	19	22
	Expected Count	18.5	22.5
	% within Faculty	46.3%	53.7%
	% within Policy	11.0%	10.4%
Arts and Sciences	Count	13	26
	Expected Count	17.6	21.4
	% within Faculty	33.3%	66.7%
	% within Policy	7.5%	12.3%
Health Sciences	Count	10	18
	Expected Count	12.6	15.4
	% within Faculty	35.7%	64.3%
	% within Policy	5.8%	8.5%
Education	Count	10	10
	Expected Count	9.0	11.0
	% within Faculty	50.0%	50.0%
	% within Policy	5.8%	4.7%
Law	Count	6	9
	Expected Count	6.8	8.2
	% within Faculty	40.0%	60.0%
	% within Policy	3.5%	4.3%
Applied Sciences	Count	9	9
	Expected Count	8.1	9.9
	% within Faculty	50.0%	50.0%
	% within Policy	5.2%	4.3%
Communication	Count	10	8
	Expected Count	8.1	9.9
	% within Faculty	55.6%	44.4%
	% within Policy	5.8%	3.8%
Pharmacy	Count	6	6
	Expected Count	5.4	6.6
	% within Faculty	50.0%	50.0%
	% within Policy	3.5%	2.8%
Foreign Languages	Count	3	6
	Expected Count	4.1	4.9
	% within Faculty	33.3%	66.7%
	% within Policy	1.7%	2.8%
Agricultural Sciences and Technologies	Count	5	4
	Expected Count	4.1	4.9
	% within Faculty	55.6%	44.4%
	% within Policy	2.9%	1.9%
Tourism and Hotel Management	Count	3	4
	Expected Count	3.2	3.8
	% within Faculty	42.9%	57.1%
	% within Policy	1.7%	1.9%
Total	Count	173	211
	Expected Count	173.0	211.0
	% within Faculty	45.1%	54.9%
	% within Policy	100.0%	100.0%

* Faculty and policy Test Cross Tabulation

Therefore, to answer the first research question, the Chi-square test was employed to determine whether there is a statistically significant difference among the instructors LMS usage. Although, the number of instructors on LMS has increased, the results in Table 2 show that a statistically significant difference does not exist ($\chi2 = 6.076$; df = 12; p > 0.05) in the active use of the LMS after the policy change.

Table 2 Chi-square Test Results

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.076[a]	12	0.912
Likelihood Ratio	6.152[b]	12	0.908
Linear –by-linear Association	0.048	1	0.827

* 0 cells (0.0%) have expected count less than 5.

To determine whether there is a difference in course access before and after the policy change and answer the second research question, Paired Sample T-Test was employed. Table 3 indicates the results of the paired sample t-test.

Table 3: Paired Sample t-tests results of Post-and Pre-tests analysis

Faculty/School (pre-policy change – post-policy change)	N	Mean	SD	Mean difference	df	t - value	p – value
Engineering	214	4747.31	7796.41	2358.49	213	4.474	**0.000**
	214	2388.82	4205.57				
Economics and Administrative Sciences	82	2469.04	3160.65	869.79	81	1.928	0.057
	82	1599.25	2759.21				
Fine Arts, Design and Architecture	58	1483.13	2016.51	213.77	57	0.706	0.482
	58	1269.36	1975.75				
Arts and Sciences	40	2936.88	3300.06	472.64	39	0.694	0.492
	40	2424.23	4590.17				
Health Sciences	44	3024.93	4445.95	1744.82	43	2.370	**0.022**
	44	1280.11	2171.82				
Education	17	1793.82	2005.33	854.47	16	1.097	0.289
	17	9393.35	2232.83				
Law	20	3212.65	4512.77	439.80	19	0.385	0.704
	20	2772.85	2974.44				
School of Applied Sciences	22	7070.50	6922.45	712.50	21	1.945	0.065
	22	4358.00	7013.74				
Communication	19	2138.95	1846.25	1097.16	18	2.217	**0.040**
	19	1041.79	1262.58				
Pharmacy	25	3913.28	3727.25	2218.76	24	2.473	**0.021**
	25	1694.52	2061.64				
School of Foreign Languages	13	2285.23	3182.49	1058.00	12	1.924	0.078
	13	1227.23	1976.96				

Agricultural Sciences and Technologies	4	351.25	167.121	-290.25	3	-0.706	0.531
	4	641.50	726.127				
School of Tourism and Hotel Management	10	781.40	443.92	278.40	9	1.764	0.112
	10	503.00	504.25				

As can be seen in Table 3, the results revealed that there is no statistically significant differences in the mean scores of the Economics and Administrative Sciences (pre-policy change test [M = 2469.04, SD = 3160.65] and post-policy change test [M = 1599.25, SD = 2759.21]), Fine Arts, Design and Architecture(pre-policy change test [M = 1483, SD = 2016.51] and post-policy change test [M = 1269.36, SD = 1975.75]), Arts and Sciences (pre-policy change test [M = 2936.88, SD = 3300.06] and post-policy change test [M = 2424.23, SD = 4590.17]), Education (pre-policy change test [M = 1793.82, SD = 2005.33] and post-policy change test [M = 9393.35, SD = 2232.83]), Law (pre-policy change test [M = 3212.65, SD = 4512.77] and post-policy change test [M = 2772.85, SD = 2974.44]), School of Applied Sciences (pre-policy test [M = 7070.50, SD = 6922.45] and post-policy change test [M = 4358.00, SD = 7013.74]) School of Foreign Languages(pre-policy change test [M = 2285.23, SD = 3182.49] and post-policy change test [M = 1227.23, SD = 1976.96]), Agricultural Sciences and Technologies(pre-policy change test [M = 351.25, SD = 167.121] and post-policy test [M = 641.50, SD = 726.127]), and School of Tourism and Hotel Management (pre-policy change test [M = 781.40, SD = 443.92] and post-policy test [M = 503.00, SD = 504.25]) with the conditions: t (81) = 1.928, p = 0.057 > 0.05; t (57) = 0.706., p = 0.482 > 0.05; t (39) = 0.694., p = 0.492 > 0.05; , (t (16) = 1.097, p = 0.289, p > 0.05); t (19) = 0.385., p = 0.704 > 0.05; t (21) = 1.945., p = 0.065 > 0.05; t (12) = 1.924., p = 0.078 > 0.05; t (3) = -0.706., p = 0.531 > 0.05; and t (9) = 1.764., p = 0.112 > 0.05 respectively. Four faculties however had a statistically significant difference: Engineering (pre-policy change test [M=4747.31, SD= 7796.41] and post-policy change test [M=2388.82, SD=4205.57]), Health Sciences (pre-policy change test [M=3024.93, SD= 4445.95] and post-policy change test [M=1280.11, SD=2171.82]), Communication (pre-policy change test [M=2138.95, SD= 1846.25] and post-policy change test [M=1041.79, SD=1262.58]), and Pharmacy (pre-policy change test [M=3913.28, SD= 3727.25] and post-policy change test [M=1694.52, SD=2061.64]) with the conditions: t (213)= 4.474 p=0.000<0.05; t (43)= 2.370 p=0.022<0.05; t(18)= 2.217 p=0.040<0.05 and t(24)= 2.473 p=0.021<0.05 respectively. Although the significant difference is noted, it did not favour the policy change as the mean values were higher pre-policy change for these four faculties. Therefore, the policy change did not influence an increase in active usage of the LMS.

To summarise the results from the two statistical tests, the indication is that the policy change was not as effective as anticipated. As mentioned in the literature some of the traits of a good LMS policy include the provision of staff training, technical support, availability and accessibility of the system, investment in infrastructure as well as clear definition and dissemination of the policy as well as addressing staff concerns with the adoption of technology (Bagarukayo & Kalema, 2015; Blackwell et al., 2014; King & Boyatt, 2015; Nasser, Ramzi. Cherif, Maha. Romanowski, 2011; Zheng et al., 2018). Most of these traits were adopted into the new policy; however some elements such as dissemination of the policy as well as investment in infrastructure were neglected in the new policy. On the former it may have been a case of ineffective dissemination as the disseminating of the policy may have been done at the top level without well managed dissemination to lower levels. On the matter of lack of infrastructure, the upgraded policy failed to address this as investments made to advancing the LMS since they take some time to reflect on the system. This may have led some users to abstain from the use of the LMS due to certain features lacking from the current LMS making it less useful for them.

Conclusion & future work

In this study findings show that the policy change did not have a statistically significant difference when it comes to the active usage of LMS by instructors as well as course access. Therefore, this study recommends that future policy implementation should be done more effectively by adhering strictly to the traits of a good policy mentioned in the literature. Institutions should however not just apply these at face value, but apply them critically, putting into consideration multiple variables that may hinder the effective and efficient implementation. Variables such as having multiple dependencies that may hinder proper dissemination of the policy, as well as not provisioning for infrastructure as technology continues to advance on a daily basis are examples. This may then culminate to improved LMS usage across faculties which may then have an impact on student engagement and motivation. For future work this study may go on to measure if the policy change has an influence on the engagement and achievement of students.

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