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Key factors affecting users' preferences in using a learning management system (LMS): The moderating role of social influence, institutional initiatives and individual motives

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Abstract
The Learning Management System (LMS) has been established in a number of universities worldwide to help connect students and lecturers without the confines of the traditional classroom. The recent advancements in information and communication technologies have altered instructional contexts and re-shaped them into smart learning environments. Due to increasing number of available smart learning features, it has become indispensable to manage these features for effective and organized instructional processes. Currently, it is commonly seen that educational institutes operate their own LMS and provide various online smart learning features for a diverse group of students. This study aims to analyze key factors that can influence users' preferences on LMS use and gain a deeper understanding of how to maximize the learning outcomes through LMS by considering six constructs, namely, Performance Expectancy, Effort Expectancy, Social Influence, Institutional Initiatives, Individual Motives and Behavioural Intension. This study involved 120 of the undergraduate and postgraduate students of a Private University of West Bengal and utilized the validated Technology Acceptance Model (TAM) to predict learners' perceptions towards LMS adoption. Four essential success factors for LMS implementations have been emerged from the perceived dataset of the students of the university who have implemented LMS in their system. The study explores the potentiality of the acceptance of the LMS perceived by the end users in the higher education system of West Bengal.
Keywords: Learning Management System, Educational institutes, Expectancy, Social influence, West Bengal.

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1. Introduction

Nowadays, it has been a popular trend in getting new information and communication technology among students. Thus, there is a special type of web-based content management systems developed which is Learning Management System (LMS). The Learning Management System which also known as LMS in the community of higher institution is an online portal which is used to connect between lecturers and students. It is a place where class material and activities can be shared easily. It is also a portal where lecturers and students can communicate and have interaction aside from classroom. In this modern era provided with information technology internet is easily accessible in urban areas, which is located at the area where it has most Universities. These studies further outline that LMS continue to influence what students share, learn and negotiate, and even have an impact on the way students think about knowledge production. This involves students' experiences of a phenomenon, which is defined as the state of having gained information through direct observation or participation in order to make meaning thereof. Performance expectancy (PE), effort expectancy (EE) and facilitating conditions (FC) are constructs within the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) to predict user acceptance and subsequent usage of a system/Information Technology. Performance expectancy is one of the constructs of the Unified Theory of Acceptance and Usage of Technology (UTAUT) model that has received considerable attention from several researchers in different fields of human endeavours (Khayati & Zouaoui, 2013; Venkatesh et al., 2003). These researchers stated, in their studies, that performance expectancy is a key construct that determines adoption and eventual usage of information systems. Performance expectancy is largely determined by indicators such as perceived usefulness, intrinsic and extrinsic motivation, job-fit, relative advantage, and outcome expectations of the Information Technology (Wu et al., 2012).

Performance expectancy refers to the degree to which an individual perceives that using a system will help him or her to attain a gain in job performance (Venkatesh et al., 2003). It can also be defined as the degree to which postgraduate and undergraduate students perceive that using LMS will enable them achieve improved performance in their academic activities. Effort expectancy is also a construct of the UTAUT model that measures the level of ease of use associated with the use of an information technology. Venkatesh et al. (2003) viewed effort expectancy as the degree of ease associated with the use of an information system. Effort expectancy is based on the idea that there are relationships between the effort put forth at work, the performance achieved from that effort, and the rewards received from the effort (Ghalandari, 2012). Effort expectancy has a direct link to the use of LMS by postgraduate and undergraduate students. This is because the use of LMS for online learning by the students is likely to be influenced by how easy or complex it is to retrieve relevant information within the shortest time possible. Furthermore, facilitating conditions as a construct in UTAUT refers to the extent to which an individual perceives that organizational and technical infrastructures required to use the intended system are available (Ghalandari, 2012). Therefore, the use of LMS could be a function of this extended Technology Acceptance Model (TAM). In order to empirically test this, the study is set to examine the influence of six constructs, namely, Performance Expectancy, Effort Expectancy, Social Influence, Institutional Initiatives, Individual Motives and Behavioural Intension on the use of LMS by postgraduate and undergraduate students in a University of West Bengal

2. Literature Review

In the literature reviews researchers Buzzetto-More (2014), Liu (2010) highlighted that how targeted YouTube videos enhance the engagement, depth understanding and overall satisfaction of the students. Few researchers Alkis et al. (2018) focused on the recent

advancement of information technologies and how Learning Management System (LMS) have taken on a significant role in providing educational resources. Other researcher Ellahi (2013) portrayed that the extent to which social networking sites can affect learning effectiveness and to what amount this technology can be used as supplementary elements for existing pedagogy methods prevailing in a developing country. Some social scientist Barrio et al. (2014) in their paper highlighted on the facts that as long as students use Web 2.0 tools extensively for social purposes then there will be always an opportunity to improve student's engagement in higher education. One researcher Baran (2014) in his paper portrayed that mobile devices have become attractive learning devices for education. Two researchers Emelyanova & Voronina (2014) focused that one of the keys to successful and efficient use of LMS was dependent on stakeholder's adaptability and perception about LMS. The research was therefore motivated by the importance of understanding two major group of stakeholders namely teachers and students' perceptions of LMS. Few researchers like Goh et al. (2013) explored the area that Learning Management System was popular for its open accessibility and interactive nature. Similarly, few other researchers focused on the Learning Management System under blended learning modality which could efficiently support online learning environments at higher education al institutions. Researchers like Bousbahi & Alrazgan (2015) depicted the picture of Middle East where to enhance instruction in higher education many universities opted Learning Management System in their teaching learning pedagogy. Two researchers Bervell & Umar (2017) said that a decade had elapsed since the Learning Management System permeated the way into higher education in Sub-Saharan Africa and the SSA offered new paradigms of both blended and online mode e-learning delivery. Some eminent researchers like Das & Majid (2020) focused on Gujarat, India where exist many renowned higher education institutes those were inclined towards using e-learning platform. Apart from this another researcher DePietro (2013) highlighted the importance of LMS perception and adaptability among the stakeholders.

2.1. Exploration of Research Gap

From the literature reviews certain gaps have been clearly identified and those are enlisted below-

- Most of the research conducted on LMS perception and usability in foreign countries as compare to home country India and specially the scenario of West Bengal, the prior researches were limited.
- LMS concept is very new in West Bengal although online teaching learning pedagogy prior exists but massive application of online teaching learning in the LMS platform were missing in the literature reviews.

2.2. Theoretical Framework

Conceptual framework is based on validated model namely Technology Acceptance Model (TAM) (Davis, 1989) is an information systems theory that models how users come to accept and use a technology whereas Perceived ease-of-use (PEOU) – Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989). Perceived usefulness (PU) was defined by Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance". This conceptual model is a simple flow chart illustrating the hypothesized relationships between research constructs that constitute the key determinants of stakeholder's intention to practice online learning.

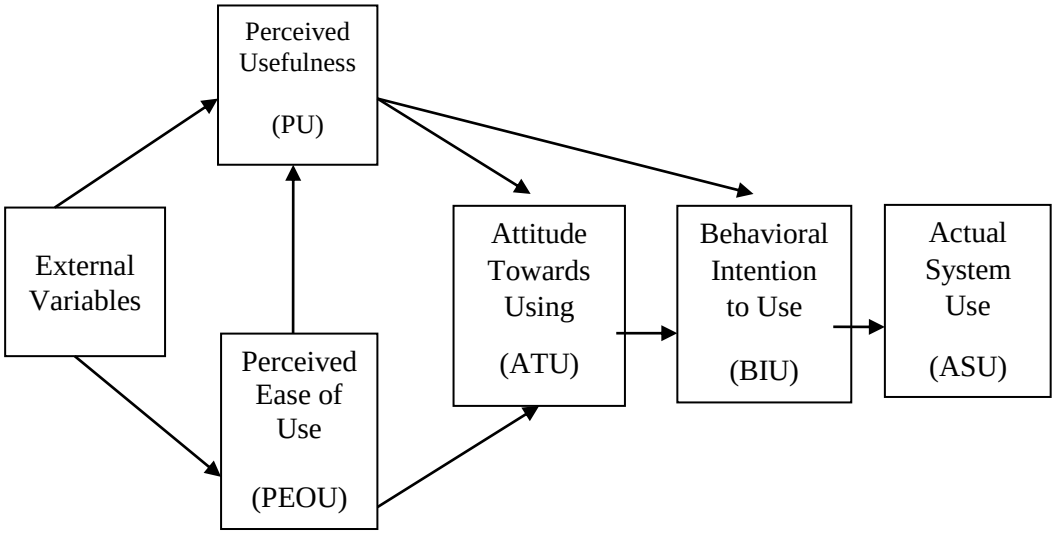

Figure 1. TAM Model (Davis, 1989)

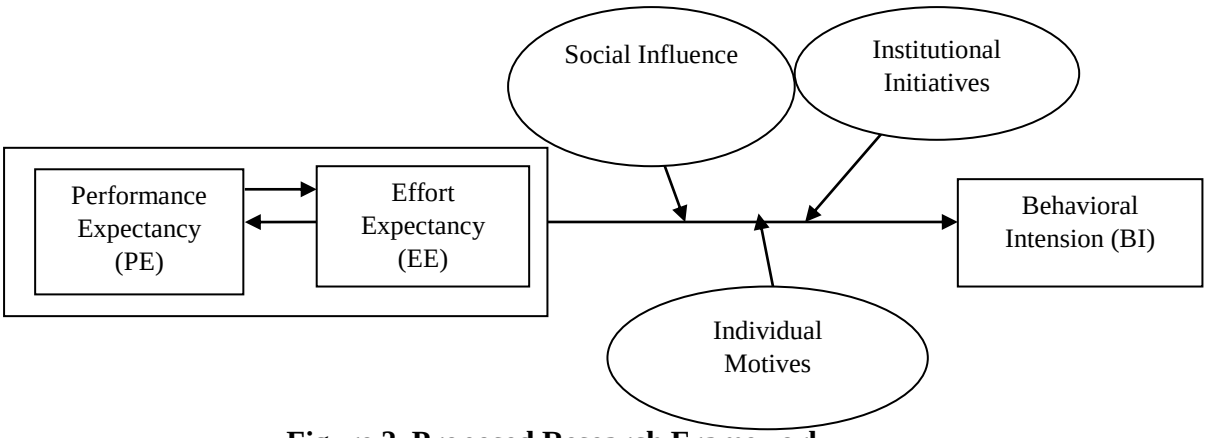

Figure 2. Proposed Research Framework

In Fig. 2, Performance Expectancy and Effort Expectancy are interdependent with each other where the outcome of these two constructs determines the Behavioural Intension of students. Social Influence, Institutional Initiatives and Individual Motives acted as moderating constructs which determine the strength of the relationship between Performance Expectancy (PE), Effort Expectancy (EE) and Behavioural Intension (BI).

3. Methodology

Table 1. Reliability-CRONBACH ALPHA OUTPUT

		N	%
Cases	Valid	120	100.0
	Excluded[a]	0	0.0
	Total	120	100.0

Table 2. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.911	0.922	20

The output of Alpha value was 0.911 from table 2 indicating excellent reliability of the designed questionnaire (as alpha>0.9) where table 1 indicating total sample size was 120.

Table 3. Reliability Statistics

Cronbach's Alpha	**Part 1**	**Value**	0.918
		N of Items	10
	Part 2	**Value**	0.783
		N of Items	10
	Total N of Items		20
Correlation Between Forms			0.688
Spearman-Brown Coefficient	**Equal Length**		0.815
	Unequal Length		0.815
Guttman Split-Half Coefficient			0.810

4. Result

Split-Half test it is shown from table 3, the 1st half Cronbach Alpha value is 0.918(as alpha>0.9) indicating excellent internal consistency among the 1st 10 questions, similarly in the 2nd half the Cronbach Alpha value is 0.783 indicating good internal consistency (as alpha>0.7) among the 2nd half 10 questions where table 3 indicating total sample size was 120.

Table 4. Factor Analysis-Output KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.891
Bartlett's Test of Sphericity	**Approx. Chi-Square**	1643.518
	df	190
	Sig.	0.000

From table 4 (KMO and Bartlett's Test) it is clearly indicated that the value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.891 which is greater than 0.6 means the sample data are eligible enough to run factor analysis.

Table 5. Communalities

	Initial	Extraction
PE1	1.000	0.728
PE2	1.000	0.726
PE3	1.000	0.790
EE1	1.000	0.629
EE2	1.000	0.663
EE3	1.000	0.604

	Initial	Extraction
SI1	1.000	0.662
SIS1	1.000	0.726
FC1	1.000	0.731
FC2	1.000	0.806
FC3	1.000	0.689
FC4	1.000	0.595
PR1	1.000	0.801
PR2	1.000	0.666
PR3	1.000	0.805
PEN1	1.000	0.765
SAT1	1.000	0.746
TRU1	1.000	0.716
BI1	1.000	0.676
BI2	1.000	0.727

Extraction Method: Principal Component Analysis.

Table 5 depicted Communality which is the proportion of common variance found in the particular 20 variables are unique.

Table 6. Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.070	45.349	45.349	9.070	45.349	45.349
2	2.625	13.123	58.472	2.625	13.123	58.472
3	1.325	6.625	65.097	1.325	6.625	65.097
4	1.231	6.154	71.251	1.231	6.154	71.251
5	0.805	4.026	75.277			
6	0.627	3.136	78.412			
7	0.582	2.911	81.324			
8	0.474	2.368	83.691			
9	0.460	2.301	85.992			
10	0.407	2.035	88.027			
11	0.399	1.997	90.024			
12	0.327	1.633	91.657			
13	0.307	1.537	93.194			
14	0.295	1.473	94.667			
15	0.241	1.204	95.871			
16	0.233	1.166	97.037			
17	0.181	0.906	97.943			
18	0.160	0.802	98.745			
19	0.140	0.701	99.446			
20	0.111	0.554	100.000			

Extraction Method: Principal Component Analysis.

From table 6 where total variable explained in detail, 4 factors (components) were extracted based on Eigen value greater than 1.

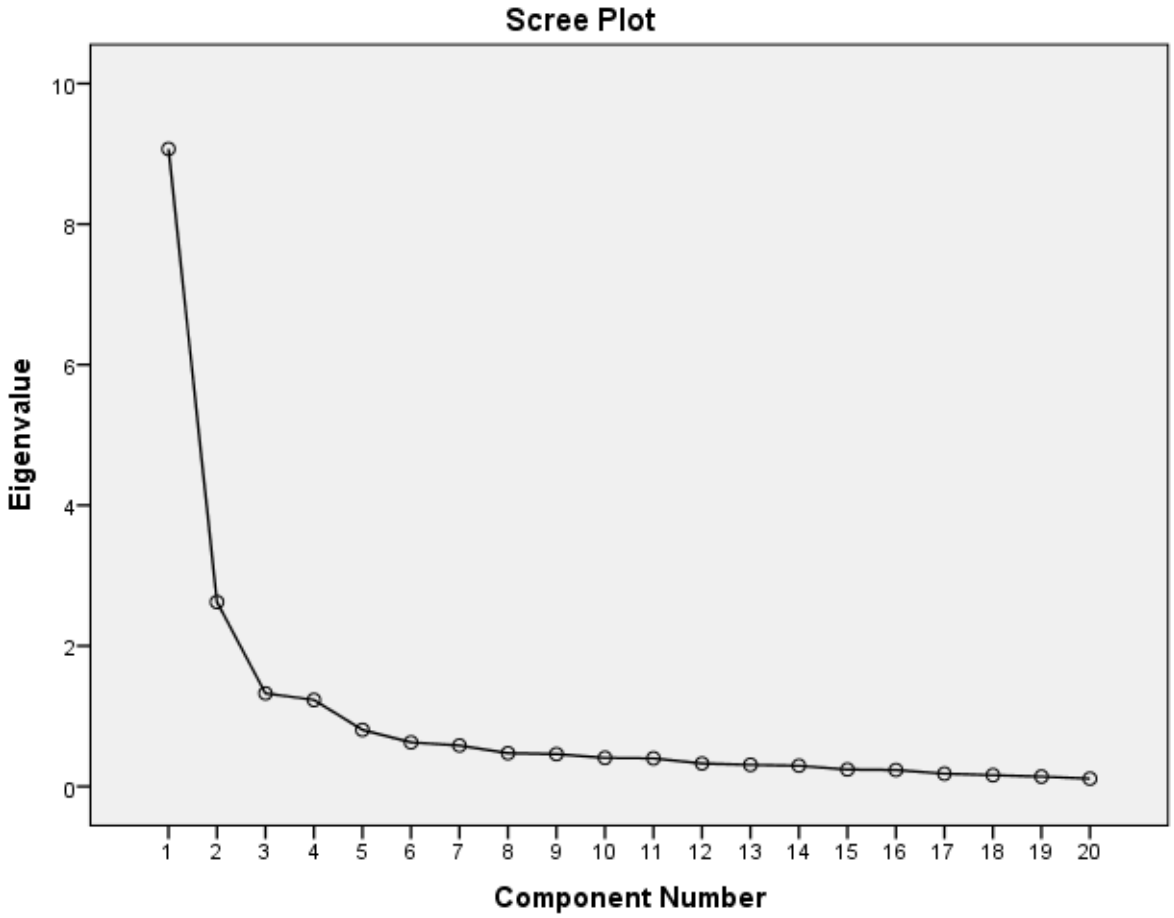

Figure 3.

To confirm the extraction of 4 factors we developed Scree plot. It is clearly indicated from Fig. 3, total 4 factors were extracted namely expectancy, conditions, reliability and intension which were exploratory in nature.

Table 7. Regression Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	EE3, PE1, EE1, PE2, EE2, PE3[b]	.	Enter

a. Dependent Variable: BI1
b. All requested variables entered.

Table 8. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.308[a]	0.095	0.047	1.1759

a. Dependent Variable: BI1

Table 9. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.331	6	2.722	1.968	0.076[b]
	Residual	156.261	113	1.383		
	Total	172.592	119			

b. Predictors: (Constant), EE3, PE1, EE1, PE2, EE2, PE3

Table 10. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.777	0.498		5.576	0.000
	PE1	-0.151	0.133	-0.140	-1.134	0.259
	PE2	-0.108	0.167	-0.096	-0.645	0.521
	PE3	0.100	0.180	0.085	0.554	0.580
	EE1	0.417	0.172	0.338	2.424	0.017
	EE2	0.115	0.173	0.094	0.666	0.507
	EE3	-0.262	0.141	-0.237	-1.865	0.065

a. Dependent Variable: BI1

From table 8, R value is 0.308 or 30.8%. R^2 is the coefficient of determination explains the variations in the dependent variable accounted for independent variables. (0 to 1 range). For BI1: R^2 =0.095 means 9.5% variations or change of Behavioural Intension (BI) of users due to change in Performance Expectancy (PE) and Effort Expectancy (EE) constructs. From the study it proves for BI1, adjusted R^2 =0.047 which is decrease from R^2 = 0.095 implies no need to introduce new independent variables except PE and EE.

From table 10, it is clearly observable out of 6 constructs EE1 and EE3 constructs are statistically significant as the significance levels are comparatively lower than other 4 constructs of the same table (EE1: Sig. 0.017, EE3: Sig. 0.065) but it is also observed from Table 10, Beta value of EE3 reflected negative value (EE3: Beta: -0.237) which indicates negative impact on Behavioural Intension component (BI1).

Table 11. Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	EE3, PE1, EE1, PE2, EE2, PE3[b]	.	Enter

a. Dependent Variable: BI2

b. All requested variables entered.

Table 12. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.734[a]	0.538	0.514	0.7800

a. Predictors: (Constant), EE3, PE1, EE1, PE2, EE2, PE3

From table 12, R value is 0.734 or 73.4%. R^2 is the coefficient of determination explains the variations in the dependent variable accounted for independent variables. (0 to 1 range). Similarly, for BI2: R^2 = 0.538 means 53.8% change of Behavioural Intension (BI) of users for change in Performance Expectancy (PE) and Effort Expectancy (EE). From the regression analysis test it also indicates R^2increases with an increase of number of independent variables. Adjusted $R^2$is actually adjusts the number of independent variables in the model and only improves when the new variables added improves the model, similarly it decreases when the new introduce variables does not affect the model. Henceforth, for BI2, adjusted R^2 = 0.514 decrease from R^2= 0.538 implies no need to introduce new independent variables except PE and EE.

Table 13. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	80.169	6	13.361	21.959	0.000[b]
	Residual	68.756	113	0.608		
	Total	148.925	119			

a. Dependent Variable: BI2

b. Predictors: (Constant), EE3, PE1, EE1, PE2, EE2, PE3

Table 14. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.182	0.330		0.552	0.582
	PE1	0.120	0.088	0.120	1.359	0.177
	PE2	0.265	0.111	0.256	2.392	0.018
	PE3	0.149	0.119	0.137	1.251	0.214
	EE1	0.096	0.114	0.084	0.840	0.403
	EE2	0.106	0.115	0.093	0.922	0.358
	EE3	0.216	0.093	0.210	2.315	0.022

From table 14, it also observed out of 6 constructs PE2 and EE3 constructs are statistically more significant as the significance levels are comparatively lower than other 4 constructs of the same table (PE2: Sig. 0.018, EE3: Sig. 0.022) along with the Beta values of these two constructs are also positive (PE2: Beta: 0.256, EE3: Beta: 0.210) which indicates positive impact of PE2 and EE3 constructs on Behavioural Intension component (BI2).

5. Discussion

To measure internal consistency or scale reliability and validity among the proposed questionnaire which consists of 20 set of questions, two tests were conducted namely, Cronbach Alpha Test and Split-Half Test in SPSS Version 21 platform. We collected 120 primary data as initial sample size through convenience sampling technique where structured questionnaire was given to the respondents in terms of BBA and MBA students of a private University of West Bengal. Our next level of statistical analysis is based on Exploratory Factor analysis to determine the number of underlying factors from the 20 set of constructed variables which was designed from the structured questionnaire. 1st Factor Expectancy includes Performance Expectancy (PE), Effort Expectancy (EE) and the moderating construct Social Influence (SI). Similarly, 2nd Factor Conditions include Facilitating Conditions (FC) which is a part of the moderating construct Institutional Initiatives. 3rd Factor Reliability

includes Perceived Risk (PR), Satisfaction (SAT) and Trust (TRU) which are the part of the moderating construct Individual Motives. Finally, 4th Factor Intension includes Behavioural Intension (BI). To analyze more and to establish our proposed research model (explained in Fig.2) we conducted multivariate regression analysis where dependent variable is Behavioural Intension (BI) and independent variables are Performance Expectancy (PE) & Effort Expectancy (EE). R= Co-relation between dependent & independent variable. (-1 to +1 range). In our study BI dependent variable further subdivided 2 components namely, BI1 and BI2 where it has been designed in such a way that signifies,

BI1: I prefer to use traditional learning in compare to online learning.

BI2: I plan to continue to use LMS frequently.

After analyzing the above-mentioned facts, we consider only 1 Behavioural Intension measuring component namely BI2 where (BI2: I plan to continue to use LMS frequently) and not considering BI1 component for our future study.

6. Conclusion

Learning Management System is playing a vital role in the learning and development process of any organization. The LMS platform created after correcting all the variety of issues mentioned above can help an organization to provide a well-organized experience. This paper has performed an end-to-end review on the literatures and revealed a shifting trend towards the investigation of the factors that may influence the usage and acceptance of LMS. Part of the study, it was found that LMS provides its users, irrespective of students, with numerous benefits. The idea of using LMS in classroom settings is to facilitate learning and enhance students' commitment and involvement as well as learning outcomes. However, it is too early to claim that teaching and learning practices are being transformed with the help of LMS. The analysis showed that students are at ease with computers and using LMS is not perceived as presenting any significant difficulty for them. It is a vital prerequisite as user perceptions are important for the success of the system, however not all learners perceive it as user-friendly. Moreover, for a number of students perceived ease of use of LMS does not imply its usefulness as a learning tool. Having analyzed the issues related to LMS adoption and use and recognizing the importance of its successful implementation, we conclude the emphasis should be laid on the human factor. Educators should be a driving force of innovation and bring university education to the next level. However, those benefits cannot be gained without the maximum utilization and involvement with LMS, which inherently requires understanding and investigation into the factors that may influence the usage and acceptance of LMS among its users. The future application of the proposed drawbacks and their improvement can help the organizations to make an informed decision about the various drawbacks present in LMS platforms and have to be avoided.

6.1. Future Scope

It is clear that even though LMS is implemented in some developing countries to support the learning and teaching activities, the utilization of LMS is still below the satisfactory level. Therefore, there is a move towards investigating into the factors that may prevent or decrease the utilization of LMS among its users. Furthermore, it is a fact that some of these factors have been investigated individually. Therefore, there is a need to empirically probe into these factors to provide a better understanding about its influences on LMS usage and acceptance. Due to lack of resources and time constraints, the study cannot be extended in a broader geographical coverage. Also, the initial sample size is restricted only 120 numbers of respondents which have to be increase in future study. The results of the research were based on primary data that was collected from students who have basic knowledge and insufficient experience of online Learning Management System (LMS). For further research it is suggested to carry out the current research using a larger sample, with longer experience to learn online.

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