

DIGITAL TRANSFORMATION IN COVID - 19: PERCEPTIONS OF UNDERGRADUATE STUDENTS

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ABSTRACT

The rise of technology has created competitive gain for higher educational institutions since it can endow with a substitute approach in facilitating enhanced quality of learning. ICT skills are becoming significant in each perspective, particularly in the workplace, therefore one of the key objectives for higher educational institutions has become grooming future professionals to be competent enough to deal with challenges and hunt for solutions, including digital proficiency as a imperative skill set. Higher education institutions regularly use Learning Management Systems (LMS) for numerous purposes like to systematically plan coursework and assessment, to aid staff and student communications, and to operate as repositories of learning materials. It is an interface with varied resources and a choice of educational activities that is incorporated within courses. It facilitates the scope of keeping an eye on each and every learner's activities with diverse types of tests, assignments, and documents. The study aimed at identifying the factors affecting the satisfaction of students as well as teachers in Learning Management System. A research model for student learning satisfaction was proposed based on the relevant review of the literature and it is empirically validated using path analysis. A data set was examined regarding the use and perceptions of students ($n = 235$) and the findings revealed that perceived usefulness and perceived ease of use have a significant effect on attitude towards use of Learning Management System of students. Specifically, when students perceive learning management system has more benefits and can improve their performance as well as it is easy to use and effortless, they will have positive attitude toward the system. The implication of the study suggests that innovative technologies can be introduced with these two principles in mind: perceived ease of use, and perceived usefulness for its effectual implementation.

Keywords: Covid -19, Learning Management System, Higher Educational Institutions, Perceived Usefulness, Perceived Ease of Use, Student Attitude, Student Satisfaction

I. INTRODUCTION

One of the main challenges of the Covid-19 pandemic and the consequential lockdown has been institutionalised education. Educational institutions have been shut to resist the spread of the virus and this has opened doors to online classrooms, a very new

concept in India even for the most sophisticated institutions. It is admirable how effortlessly some educational institutions have adapted to virtual classrooms, all credit to tools such as Zoom, Google Hangouts and Microsoft Teams. However, there are some institutions still trying hard to get online.

Prior to COVID-19, there was already high demand and acceptance in education technology, with global edtech investments reaching US\$18.66 billion in 2019 (“2019 Global Edtech Investments Reach a Staggering \$18.66 Billion | Markets Insider,” 2020) and the overall market for online education projected to reach \$350 Billion by 2025 (“Online Education Market Study 2019 | World Market Projected to Reach \$350 Billion by 2025, Dominated by the United States and China,” 2019). No matter what language apps, virtual tutoring, video conferencing tools, or online learning software, there has been a noteworthy spurt in the usage since COVID-19.

Research Institute of America found that on an average, students keep hold of 25-60% more material when learning online matched up to only 8-10% in a classroom. This is generally due to the students being able to learn quicker online; e-learning needs 40-60% less time to learn than in a traditional classroom setting (Pezold, 2017) since students can understand at their own competence, going back and re-reading, skipping, or speeding up via concepts as they wish.

From these previous studies, it is clear that introducing digital learning platforms in educational institutions seems to be the need of the hour. So educational institutions can design their own Learning Management System, which is appropriate for the curriculum. It will be a solution to the prevailing challenge as well as forthcoming uncertainties in the future. The integration of information technology in education can be accelerated with reliable internet sources and digital equipments. Learning management systems are a relatively new phenomenon in higher education at least to some institutions, having become common place only in the last 10 to 15 years. While largely are in a nascent stage, learning management systems have taken hold in higher education. When there is a universal reception to these digital learning, it is high time to check or evaluate the quality of these Learning Management Systems in educational institutions. The quality of the digital learning can be measured with learner satisfaction (McGorry, 2003). Hence this study is an attempt to analyse the satisfaction of students on LMS (Learning Management System). The findings of this research will be useful for faculty members, educational institutions as well as students to enhance the teaching and learning process.

Learning Management System (LMS) is application software that has played a vital role in education. Such software can be considered to support and augment instructional activities comprising registration and management of education courses, tracking skill gaps and reporting and facilitating electronic courses along with (Gilhooly, 2001). The evolution of information technology such as internet boosted the growth of online educational programs, which revolutionize the traditional system of education (Sher, 2009). Technology can be an apposite vehicle for intensifying meaningful and engaged

learning. It permits students to work on real, meaningful, and exigent problems, alike responsibilities carried out by professionals in various fields; to deal with data in ways that allow student-directed learning; to implant knowledge collaboratively; and to network with eminent personalities in the same sector. Technologies also can be adopted to uphold the development of outstanding thinking skills and encourage teachers to act as facilitators or guides and often as a co-learner with the students. Technology updations and the internet have produced remarkable opportunities for new education paradigms, accompanying in the new economy defined by knowledge and access to information.

Learning management systems (LMS) are generally used by higher education institutions to convey, handle, and track online learning, as well as to assist interaction and collaboration between instructors and students (Motaghian, Hassanzadeh, & Moghadam, 2013). Ellis (2009) defines a learning management system as any software/hardware application that has the roles like administration, tracking, documentation, and reporting for instructional/educational programs. The term Learning Management System can also be defined as an online learning platform, or software that is developed to organize and manage electronic learning (Anderson, 2008). The term electronic learning is used to express the use of internet to access learning content and resources, interacting with instructors and other students (Moore, Dickson-Deane & Galyen, 2011).

The rise of technology has created competitive gain for higher educational institutions since it can endow with a substitute approach in facilitating enhanced quality of learning. Since an education system needs requirements like mechanisms of access control, communication and results monitoring, an LMS can be a well thought-out solution. An LMS functions as an infrastructure in order to oversee and distribute the instructional content, categorize and appraise learning objectives, pursue the development of training goals, and collect data for organizing the education process (Szabo & Flesher, 2002). . It is an interface with varied resources and a choice of educational activities that has incorporated within courses. It facilitates the scope of keeping an eye on each and every learner's activities with diverse types of tests, assignments, and documents. Furthermore, it offers easy interaction and alliance between instructors and students by means of discussion forums (Abdel-maksoud, 2018). LMS helps instructors to generate online courses, and training courses. Besides developing, managing and conveying e-courses to their learners, instructors can also evaluate their learner's improvement by tracking detailed reports and statistics. Another important feature of an LMS is that it offers learners with online classrooms where they can interact and learn in an open environment.

Many educational institutions are utilizing technology as an effective tool for monitoring and improving organization's performance (Azian, Rahman, Hussein, & Hairianie, 2015). As such, it is no longer the issue in education if technology should be used. Undeniably, there are immense potential paybacks in making use of technology to augment learning.

The present stress is also on confirming that technology is implemented efficiently to generate new opportunities for learning and to encourage student achievement. By means of proper software for teaching and learning, it can excite students to learn, students can learn at their own capacity, be given individual consideration, and become more student-centered. Educational institutions, which were previously having lawful status, are now inquisitive of reforms that are capable to guarantee quality.

II. THEORETICAL FRAMEWORK AND HYPOTHESES FORMULATION

The Technology Acceptance Model (TAM), developed by Davis, Bagozzi, &Warshaw (1989) steers the theoretical framework for the particular study. It elaborates the factors that persuade user satisfaction in usage of new technologies. According to Venkatesh & Davis (2000) Technology Acceptance Model has become entrenched as a model for predicting user acceptance. It uses ease of use and individual beliefs towards usefulness to establish attitudes and intentions toward using new technologies (Shin, 2009). The foremost predictors of an individual's intention and acceptance to espouse and use new technology include their perceptions of its ease of use and its usefulness (Davis, 1993). Hence it can be concluded that by analyzing the end users intention to make choices of rational nature and available information about their usage decides their level of acceptance of a new technology. Assessing the perception of users is the most important purpose of Technology Acceptance Model. It analyses two aspects or variables which impacts an individual's behaviour when they use new technology; first one is perceived ease of use and second variable is perceived usefulness.

According to Davis (1989) perceived usefulness is defined as "the degree to which a person sees that a certain system will boost his or her performance". According to the framework of E-Learning perceived usefulness is defined as "the degree to which user sees that the adoption of e-learning system can result in improving his or her learning outcomes" (Sun, Tsai, Finger, Chen, &Yeh, 2008). Perceived usefulness assess at end users perception and beliefs that usage of new technology will advance their individual level performance. In this particular study perceived usefulness is the extent to which a student (user) deems that Learning Management System (LMS) would augment their performance in studies. It also explains the degree to which student deems Learning Management System (LMS) would support better performance in their academics.

Perceived usefulness was one of the key aspect or factor that predicted a student's satisfaction towards e-learning or online learning (Drennan, Kennedy & Pisarski, 2005). Learners have a key role in e-learning platforms hence it engages them in different learning activities and motivates them to take part in more tasks compared to traditional learning scenario. These results in a self-regulated and interactive learning platform for the students and it will have a positive effect on their learning outcomes. Once the students recognize and perceive that online learning is beneficial, the usage will be more.

Perceived ease of use is the extent to which a person or user understands that using a particular technology or system is free from much mental and physical effort Davis (1989). When a person understands that a particular system or technology is user friendly they will continue using that and vice versa. When we discuss ease of use in the scenario of e-learning it is obviously a users expectation and perception that a particular system is easy to understand and use and it does not require much effort to handle it (Sun et al., 2008). Actual technology is given more emphasis on perceived ease of use. The user will be concerned about the difficulty level in using the technology for completion of their work related assignments and tasks. Both the aspects decided whether the users will continue to use new technology or not based on its usefulness and ease of use.

Previous numerous studies analyzed the under graduate students perceptions and their intentions to use e-learning platforms and resources by assessing perceived ease of use and usefulness (Shelley & Sahin, 2008). Findings of most of the studies revealed that students who are reusing e-learning platforms are those who found it useful and easy to use. Hence necessitate for well-designed e-learning platform is essential whereas it meets the expectations and needs of users (students) (Joo, Lim & Kim, 2011).

E- Learning in higher education scenario facilitates the students to accomplish their personal goals plus career targets. Without an unbending schedule they are able to comprehend the concepts of various subjects and can participate in various practical assessments and activities through an e-learning platform (Borstorff & Lowe, 2007). When the students perceive the content as interesting and relevant, they actively participate in the sessions. Their interaction level depends on usefulness as well as ease of use with respect to technology (Entmer et al., 2008).

A research model which included e-learning satisfaction of students was proposed based on the pertinent review of the literature in the relevant areas. This model proposes that there are two major factors that lead to the perception of students towards satisfaction of LMS (Learning Management System). The two variables are perceived ease of use and usefulness. The Figure 1 explains the hypothesized model for this particular research study.

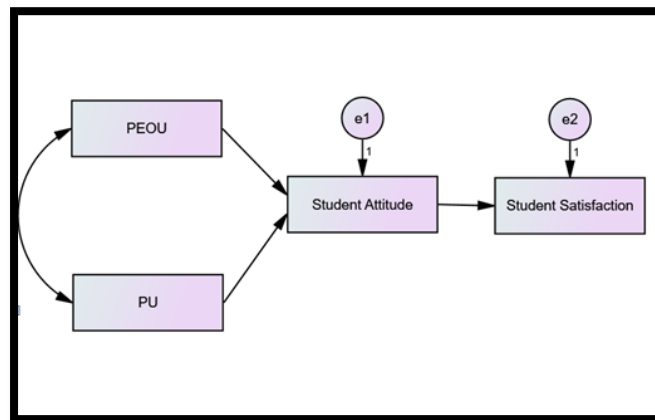


Figure 1: Hypothesized Model

From the literature review it is hypothesized as

H1: Perceived usefulness has a positive and direct effect on attitude of students towards

LMS

H2: Perceived ease of use has a positive and direct effect on attitude of students towards

LMS

H3: Attitude of students towards LMS has a positive and direct effect on student satisfaction

III. METHODOLOGY OF THE STUDY

The qualitative and quantitative approach is adopted in this study to examine the satisfaction of students towards the digital transformation that is the use of LMS in education. The researchers decided to adopt survey method, which will provide a maximum realistic response. The study used convenience sampling technique for the selection of samples. The data had collected from 235 undergraduate students in Bangalore.

IV. SCALE OF MEASUREMENT

The questionnaire used for collecting the data consists of two sections; one is for collecting the demographic profile and the other one is for collecting the perception of students related to perceived usefulness, ease of use, attitude and the satisfaction. Items were measured using a Likert 5-point scale ranging from 1 (strongly disagree) to

5 (strongly agree). Scale was developed based on Technology acceptance Model (TAM) by Fred Davis, 1989.

In this particular study perceived usefulness is the extent to which a student (user) deems that Learning Management System (LMS) would augment their performance in studies. It also explains the degree to which student deems Learning Management System (LMS) would support better performance in their academics. Perceived ease of use is the degree to which a person or end user understands and perceives that using a particular technology or system is free from much mental and physical effort. When a student has a perception that a particular system or technology is user friendly they will prolong using that and vice versa.

V. RESULTS AND DISCUSSION

a. Model Testing

From the literature review, a model was developed and path analysis was used for testing the model. According to the model, perceived ease of use, perceived usefulness and attitude hypothesized to influence student satisfaction. The path analysis showed an X^2 value of .432 ($p = 0.518$), GFI of 0.963, an AGFI of 0.954, a normed fit index of 0.996, a comparative fit index of 1.000 for students.

TABLE 1- Model Testing

Hypothesized path	Estimate	C.R.	P
Student attitude <--- PEOU	.352	3.644	0.00
Student attitude <--- PU	.83	.5.838	0.000
Satisfaction <--- Student attitude	.218	2.198	0.000

Hypothesis one predicts that perceived ease of use (PEOU) has a direct and positive influence on attitude of students towards LMS. As it is in Table 2, the estimated value for hypothesis is the estimated value for this hypothesis is 0.352 with a critical ratio of 3.644 ($p < 0.05$) indicating a positive relationship between Perceived ease of use and on attitude of students towards LMS. This finding is in parallel with the (Davis, 1989) as Educational technology with a high level of ease of use is more likely to induce positive attitudes towards acceptance On the other hand, Liu et al (2009) found in their study that perceived ease of use was significant predictors of attitude towards use that will lead affect the acceptance.

Hypothesis two predicts that Perceived usefulness (PU) has a direct and positive influence on attitude of students towards LMS. As it is in Table 1, the estimated value for hypothesis is the estimated value for this hypothesis is 0.83 with a critical ratio of 5.838 ($p < 0.05$) indicating a positive relationship between Perceived usefulness and on attitude of students towards LMS. This finding is in accordance with the study conducted by Klopping and McKinney (2004) who found in their study that the perceived usefulness will influence directly the intention and actual of use of technology. Moreover, perceived usefulness can influence students' intention to use technology strongly, also it is a major determinant of students' intention to use technology (Davis; Bagozzi&Warshaw, 1989).

Hypothesis three predicts that attitude towards LMS has a direct and positive influence on the satisfaction of students. As it is in Table 2, the estimated value for hypothesis is the estimated value for this hypothesis is 0.218 with a critical ratio of 2.198 ($p < 0.05$) indicating a positive relationship between attitude of students towards LMS and the satisfaction of students. This findings is in accordance with (Al-Zaidiyeen, 2010 & Metin 2012)

VI. DISCUSSION

The results of this study have shown that perceived usefulness and perceived ease of use have a significant effect on attitude towards use. In other words, when students perceive learning management system as one that can improve their performance as well as it is easy to use and effortless, they will have positive attitude toward the system. The reason may be majority of the learners are having short attention spans and an attachment to their mobile device. These findings support Chen and Huang(2010); Liao et al, (2009) ; Schaik and Teo, (2009); and Teo, 2009) Specifically, the result shows that the students will be more satisfied if they feel the digital learning is useful and provide more benefits to them. Because online courses give students full control over their own learning, students are able to work at their own speed. Generally, students work faster than they would do otherwise and take in more information. They are able to move faster through areas of the course they feel comfortable with, but slower through those that they need a little more time on.

Another interesting but expected finding is that the attitude towards LMS has a direct and positive influence on the satisfaction of students. This finding is in accordance with (Al-Zaidiyeen, 2010 &Metin 2012). The undergraduate students, who are part of the Gen Z category, are tech savvy and they prefer everything to be available on their finger tips. Rather than carrying heavy text books or searching through the racks in the libraries, they prefer searching information online. Bangalore being the IT hub of India has better digital infrastructure like high speed internet and latest gadgets available at minimal cost. This generates a positive attitude in youngsters which leads to satisfaction and better learning experience.

VII. IMPLICATIONS OF THE STUDY

For education institutions and academics, LMS serves as an alternative to traditional learning methods. Digital learning is the need of the hour. Educational institutions which were reluctant to adopt digital learning platform cannot sustain anymore, as proved by the COVID – 19 pandemic. The findings of the study proposes that new technologies shall be designed with two principles in mind, they are perceived ease of use and perceived usefulness. Evaluating existing systems in the light of these two principles can improve the design and implementation of such systems. Rather than sticking on to sophisticated technologies, the platform should be user friendly and rich in meaningful content. It is suggested that providing training to learners on usage of the Learning Management System enhances the quality of learning by attracting students to a better platform and exposure.

REFERENCES

- Abdel-maksoud, N. F. (2018). The Relationship between Students ' Satisfaction in the LMS “ Acadox ” and Their Perceptions of Its Usefulness , and Ease of Use, 7(2), 184–190. <https://doi.org/10.5539/jel.v7n2p184>
- Anderson, T. (2008). *The theory and practice of online learning*.Edmonton: AU Press.
- Azian, N., Rahman, A., Hussein, N., & Hairianie, A. (2015). Satisfaction on Blended Learning in a Public Higher Education Institution : What Factors Matter ?, 211(September), 768–775. <https://doi.org/10.1016/j.sbspro.2015.11.107>
- Becker, H. & Riel, M. (2000). Teacher Professional Engagement and Constructivist-Compatible Computer Use Teaching, Learning, and Computing: 1998 National Survey, Report No 7
- Borstorff, P.C. & Lowe, S.K. (2007) Students Perceptions and Opinions toward E- learning in the College Environment. *Academy of Educational Leadership Journal*, 11 (2), 13-29.
- Chang, S.C. and F.C. Tung, (2008).An empirical investigation of students' behavioural intentions to use the online learning course websites. *British Journal of Educational Technology*, 39: 71-83.
- Chang, C., Yan, C., & Tseng, J. (2012). Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, 28 (5), pp. 809-826
- Chen, H. R., & Huang, H. L. (2010). User Acceptance of Mobile Knowledge Management Learning System: Design and Analysis. *Educational Technology & Society*, 13 (3), 70–77.
- Davis, F., Bagozzi, R., &Warshaw, P. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982-1003.<https://doi.org/10.1287/mnsc.35.8.982>

Drennan, J., J. Kennedy and A. Pisarski, (2005). Factors affecting student attitudes toward flexible online learning in management education. *The Journal of Educational Research*, 98(6): 331-8.

Ellis, R. K. (2009). Learning Management Systems. Td.org. Retrieved from <https://www.td.org/Publications/Newsletters/Learning-Circuits/Learning-Circuits-Archives/2009/09/Learning-Management-Systems-2009>

Ertmer, P., TemurGedik, N., Richardson, J. & Newby, T. (2008). Perceived Value of Online Discussions: Perceptions of Engineering and Education Students. In J. Luca & E. Weippl (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications*. (pp. 4679-4687).

Gilhooly, K (2001), "Making e-learning effective", *Computerworld*, Vol. 35, No. 29, pp. 52–53

Global Edtech Investments Reach a Staggering \$18.66 Billion | Markets Insider. (2020, January 7). Retrieved May 12, 2020, from <https://markets.businessinsider.com/news/stocks/2019-global-edtech-investments-reach-a-staggering-18-66-billion-1028800669>

Hammond, L., and Berry, B. (1998). "Investing in teaching: The dividend is student achievement", *Education Week*, p. 48.

Joo, Y. J., Lim, K. Y., & Kim, E. K. (2011). Online university students' satisfaction and persistence: Examining perceived level of presence, usefulness and ease of use as predictors in a structural model. *Computers & Education*, 57(2), 1654-1664. Doi:<http://dx.doi.org/10.1016/j.compedu.2011.02.008>

Liu, S.H., Liao, H. L., and Pratt, J.A. (2009). Impact of media richness and flow on e learning technology acceptance. *Computers & Education*, 52, 599–607.

McGorry, S. Y. (2003). Measuring quality in online programs. *Internet and Higher Education*, 6(2), 159–177. [https://doi.org/10.1016/S1096-7516\(03\)00022-8](https://doi.org/10.1016/S1096-7516(03)00022-8)

M. Metin, G. K. Yilmaz, K. Coskun, S. Birisci (2012), " Developing an attitude scale towards using instructional technologies for pre-service teachers", *The Turkish Online Journal of Educational Technology*, Vol. 11, No. 1, pp. 36–45.

Moore, J., Dickson-Deane, C., & Galyen, K. (2011). E-Learning, online learning and distance learning environments: Are they the same? *The Internet and Higher Education*, 14(2), 129-135. <https://doi.org/10.1016/j.iheduc.2010.10.001>

Motaghian, H., Hassanzadeh, A., & Moghadam, D. (2013). Factors affecting university instructors' adoption of web-based learning systems: Case study of Iran. *Computers & Education*, 61, 158-167. <https://doi.org/10.1016/j.compedu.2012.09.016>

N. J. Al-Zaidiyeen, L. L. Mei, F. S. Fook (2010) "Teachers' attitudes and levels of technology use in classrooms: the case of Jordan schools", *International Education Studies*, Vol. 3, No. 2, pp. 211- 218.

Online Education Market Study 2019 | World Market Projected to Reach \$350 Billion by 2025, Dominated by the United States and China. (2019, December 17). Retrieved May 12, 2020, from <https://www.globenewswire.com/news-release/2019/12/17/1961785/0/en/Online-Education-Market-Study-2019-World-Market-Projected-to-Reach-350-Billion-by-2025->

Dominated-by-the-United-States-and-China.html

Pezold, S. (2017, February). Paycom BrandVoice: LMS 101: Rethinking Your Approach To Employee Training. Retrieved May 12, 2020, from <https://www.forbes.com/sites/paycom/2017/02/14/learning-management-systems-101-rethinking-your-approach-to-employee-training/#68ec54bb755b>

Sahin, Ismail and Shelley, Mack. (2008). Considering Students' Perceptions: The Distance Education Student Satisfaction Model. *Journal of Educational Technology & Society*, 11(3), 216-223.

Schaik, P. V. & Teo, T. (2009). Understanding Technology Acceptance in Pre-Service Teachers: A Structural-Equation Modeling Approach. *The Asia-Pacific Education Researcher*, 18 (1), 47-66.

Sher, A. (2009). Assessing the relationship of student-instructor and student-student interaction to student learning and satisfaction in Web-based Online Learning Environment. *Journal of Interactive Online Learning*, 8(2).

Shin, D. (2009). An empirical investigation of a modified technology acceptance model of IPTV. *Behaviour & Information Technology*, 28(4), 361-372. <https://doi.org/10.1080/01449290701814232>

Sun, P., Tsai, R., Finger, G., Chen, Y., & Yeh, D. (2008). What drives a successful E-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, 50(4), 1183-1202. <https://doi.org/10.1016/j.compedu.2006.11.007>

Szabo, M and Flesher, K, (2002). CMI Theory and Practice: Historical Roots of Learning Management Systems

Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teachers. *Computers & Education*, 52(1), 302-312.

Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>

Wu, J., & Liu, W. (2013). An Empirical Investigation of the Critical Factors Affecting Students' Satisfaction in EFL Blended Learning, 4(1), 3-3.