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Effectiveness of Learning Management System (LMS) in Sustainable Learning and Development among Bank Employees

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Abstract

Learning Management Systems in the form of E-Learning platform is currently an evolving scenario for the primary means of delivering various courses across educational, business, industries and vocational learning environments in the form of Learning and Development activities in all the sectors. LMS is a challenging and resource-intensive task requires demanding substantial knowledge, time, and effort. Consequently, there emerged a necessity in both research and practical applications to establish the personalized usage process of an LMS. Despite its significant impact on the outcomes of such an Information System (IS), the usage process has to be analysed. The researcher developed a conceptual model to delineate with set of factors to influence LMS course in Learning and Development Practices in industry context. Researcher revealed specific set of factors such as interface design, content presentation format, transfer of learning, and feedback mechanisms significantly impact learner satisfaction among Bank employees in their Learning and Development activities. Moreover, learner satisfaction depends on the application platform and content. The findings offer a valuable insight to design a corporate education system, with the quality content delivery and practical delivery. By considering these results, designers can develop more integrated and effective LMS to cater the needs and satisfaction of Learning and Development activities among Bank employees.

Keywords: *Learner Satisfaction, Learning Management System, Course Effectiveness, Learning and Development Practices.*

Introduction

Over the last decade, the way computers are used in education has changed dramatically, increased the emphasis on using computers in the educational sphere. In this progression, e- learning has emerged as a modern teaching and learning tools to utilise cutting-edge technology **(Ma et al., 2008)**. Increase in student's upgradation towards e-learning has become an essential instrument for disseminating lot of tech-education based learning by the application of LMS. In various educational and organizational contexts, offering a platform for delivering, managing, and tracking learning activities , with diverse perspectives on their implementation, effectiveness, and impact. The global market for LMS is anticipated to expand about 14.0 per cent from USD 13.4 billion in 2020 to USD 25.7 billion by 2025, owing to several favourable factors **(LMS Market Global Report, 2020)**.

The corporate LMS market is expected to rise as more firms install advanced learning management systems. Companies utilise the corporate learning management framework to educate and train their employees. The education and training are accomplished via the use of both traditional training methods as well as e-learning. Corporate learning management facilitates testing and measurements for determining an employee's progress **(Global Corporate LMS Market Report, 2020)**.

In V-Buddy: A Learning Management System, present V-Buddy introduced at the 2018 Second International Conference on Electronics, Communication, and Aerospace Technology (ICECA), to enhance the learning experience through its features and functionalities **(Wadkar et al., 2018)**. In "Perceived Promoters of and Barriers

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to Use of a Learning Management System in an Undergraduate Nursing Program" **(Alhosban and Ismaile 2018)** investigates the factors influencing the utilization of an LMS in an undergraduate nursing programme LMS adoption, shedding light on the complexities involved in integrating technology in educational settings. Learning Management Systems (LMS), a crucial software platform for delivering education and training courses online, are a direct result of e-learning. They make it easier for enterprises of all kinds and types to handle educational material by enabling the production, management, and distribution of instructional content. The global market for LMS is anticipated to expand (CAGR) of 14.0 per cent from USD 13.4 billion in 2020 to USD 25.7 billion by 2025, owing to several favourable factors **(LMS Market Global Report, 2020)**.

The corporate LMS market is gradually increased in many firms to install advanced learning management systems. Companies utilise the corporate learning management framework to educate and train their employees. Educational sector also increased via blended learning. Corporate learning and practice activities been highly influenced by LMS (Global Corporate LMS Market Report, 2020). Whereas in "Evaluating Programme-Wide Course Redevelopment within a Learning Management System". Hooson-Smith and Williamson (2023) examine the process and outcomes of program-wide course redevelopment within an framework along with the challenges and opportunities associated with leveraging LMS for comprehensive educational initiatives. Faqihi and Miah (2023) explore the application of artificial intelligence in talent management systems, touching upon the potential risks and theoretical underpinnings of such technological advancements. While not directly focused on traditional LMS, to the broader discourse on technology-enabled learning environments. There are research studies in other sectors also like healthcare.

Ranjan et al., (2023) analysed the transformative impact of technology on healthcare delivery from 2018 to 2023. Although not exclusively centred on LMS, their examination of technological advancements underscores the evolving landscape of digital tools in education and training, including the potential implications for LMS integration in healthcare education. In "Effectiveness of Learning Management System" Samson and Yango (2023) investigate the effectiveness in enhancing learning outcomes and engagement underscores the importance of LMS usability and teacher proficiency in optimizing student learning experiences.

Halim et al., (2023) assess the student's satisfaction with LMS-integrated video conferencing tools, highlighting the importance of user experience in blended learning environment underscore the need for seamless integration of technological solutions to enhance educational outcomes.

LMS Usage

Many applications can be integrating in the application of LMS to design and distribute the content, track student involvement, and evaluate student performance using a learning management system. According to **Terra Gargano et al., (2021)** with various interactive tools like discussion boards, video conferencing, and threaded conversations. LMS is are commonly utilised by organisations of all sizes, by local, state, and federal government entities, as well as traditional and online/eLearning-based educational institutions. The solutions can save businesses time and money while enhancing conventional teaching techniques. Instructors and administrators will be able to handle many aspects of the system, including user registration, content, calendars, user access, communication, certificates, and notifications, effectively if the system is functional.

LMS Usage in Banking Sector

Corporations, particularly those in the banking sector, must work hard for the competitiveness in market in today's tight and competitive business environment. The information workers need to do their tasks is evolving swiftly, and investing in people's knowledge has become a vital indicator of an organisation's strength **(Glass, 1998)**.

Alongside the expansion of technology and businesses are transitioning from traditional vocational e-learning to workforces better. Companies can employ e-learning as an extra training resource for upskilling the employees (Vaughan & MacVicar, 2004).

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The requirement for affordable and practical training and the knowledge's quick obsolescence has been recognised as the two main drivers for e-learning utilisation in the workplace **(Fry, 2001)**. According to **Govindasamy (2002)**, businesses must create more effective and efficient workplace learning environments to achieve organisational goals, and this necessitates holding staff training sessions at various locations and times. E-learning effectively overcomes the time and location constraints for this work. It produces benefits, such as lower costs, regulatory compliance, satisfying business requirements, retraining employees, and low costs for ongoing operations and customer support **(Gordon, 2003)**.

To highlight a few, table 1 shows the learning management systems (LMS) have been implemented in Indian banks, including both public and private ones.

Table 1. Names of the LMS Used by Some of the Banks in India

Name of the Bank	Name of the LMS used
State Bank of India	*eLearning Gyanodaya*
Bank of Baroda	*Baroda Gurukul*
Canara Bank	*CanDLE*
Central Bank of India	*Cent Swadhyay*
Axis Bank	*Axis Learning LMS*
ICICI	*The Learning Matrix*
HDFC	*HDFC Aspire*
Federal Bank	*Fed Campus*

Source: Respective Bank's LMS Porta

Theoretical Background of the Study

The research article synthesised the pertinent existing framework and model as a basis for developing the working conceptual framework to validate the proposed model for LMS course learning effectiveness effectively. This was done so that the suggested model could be successfully validated.

E-Learning Framework

The e-learning process requires careful consideration of the potential, together with instructional design concepts and issues vital to many elements of the e-learning environment, according to this framework developed by Kishabale (2018) & Badrul H. Khan (2001). technological, pedagogical, interface design, assessment, managerial, institutional, and ethical resource assistance. The pedagogical and interface design components were changed to better explain the learning management system's (LMS) quality requirements. The pedagogical part of Khan's octagonal framework for e-learning takes into account the design approach, organization, analysis, medium analysis, and learning techniques for e-learning, among other things, interface design dimension analyses to describe the e-learning environment's general look and feel.

Therefore, the following facets are considered relevant to the current study: Pedagogical design, Interface design, Content presentation format **(Kishabale Bashir et al., 2018)**. Transfer of learning **(Javier Rodríguez-Santero et al., 2020)** Feedback of learning **(Sangjae Lee et al., 2015)** Learner satisfaction **(Joel S. Mtebe, 2014)** and LMS Course learning effectiveness **(Lee Yen Chaw et al., 2018)** has been integrated in the model to identify the Quality factors on LMS Course learning effectiveness at workplace in the post usage context.

Pedagogical Design

The pedagogical aspect covers teaching, learning concerned with the design approach, organization, learning techniques, goal analysis, content analysis, and media analysis.

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Interface Design

The entire appearance is referred to as interface design, accessibility, and usability testing are all included in the interface design.

Content Presentation Format

The amount of time an online learner spends reading, studying, seeing websites and PowerPoint presentations, engaging in discussion boards, and passing quizzes is known as the content presentation format. According to Su et al. (2005), online learners interact with the course material while seeing or listening to audiovisual materials. Navigational controls, hyperlinks, animations, pictures, sounds, and video interactive components include things like objects, tasks, and built-in exercises.

Transfer of Learning

The ultimate objective of any training procedure is spoken about the effective application of new information, abilities, and attitudes to the workplace, it is about the transfer of learning.

Feedback of Learning

According to **Kahai and Cooper (2003)**, feedback immediacy influences decision quality by allowing a recipient to comprehend signals more clearly. Concurrent feedback, which happens concurrently with the communication of a message, and sequential feedback, which happens when the receiver interrupts the sender or uses a pause in the sender's communication to indicate an understanding of a message or to direct the sender, are both possible with immediate feedback. Feedback from learning enhances two-way communication and message understanding.

Learner Satisfaction

This concept gauges how learners feel about the system. **Ives, Olson, and Baroudi (1983)** assert that regardless of the findings of any study, a system is, in fact, inadequate if users believe it to be thus. On the other side, more "user happiness" will result in higher "intention to use," which will ultimately result in higher usage **(Delone & Mclean, 2003)**. As a result, pleased users will keep using the system and are more likely to think that it helps them learn.

Learner's course satisfaction is defined as how content or satisfied the student is with what they have learned in the online course. Course satisfaction is crucial since it will encourage and drive students to study more, claim **Artino and Stephens (2009)**. In online environments with end-of-course satisfaction, **Chiu, Sun, Sun, and Ju (2007)** and **Roca, Chiu, and Martnez (2006)** have recognized student satisfaction as an actual result. Course purpose, course content, course suggestion, course discussion, and overall course satisfaction are used to determine course satisfaction in the context of this study **(Arbaugh, 2000; Artino, 2008; Gunawardena & Zittle, 1997; Lee et al., 2011; Keeler, 2006)**.

Learning Effectiveness

Learning effectiveness generally relates to how successfully someone has acquired knowledge or abilities **(Hu & Hui, 2012; Sahasrabudhe & Kanungo, 2014)**. Learning efficacy is a popular dependent variable operationalized variously in prior learning research. Some employed realistic evaluation marks or grades, others relied on perception-based metrics, while others utilized a mix of objective and subjective metrics. Learners anticipate that using an LMS will enable them to learn more efficiently.

Problem Identification

LMS have become the standard of practice for providing and managing online courses in settings such as those found in educational institutions, corporations, government agencies, and vocational settings. Since

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the middle of the 1990s, a wide variety of LMS that come equipped with a multiplicity of functions for sale on the market. Evaluating LMS is a challenging and time-consuming, the expertise is due to the increasing complexity of these platforms. Nearly half of those who participated in the surveys that Panagiotis Zaharias and Christopher Pappas (2016) ran reported that the primary reason they are interested in switching from their current LMS is because of problems with the user experience.

LMS entails and which implications one can derive for the usage process-oriented and, as a result, user-centred design of an LMS, which will ultimately result in an effective usage pattern.

This can be accomplished though the use of an effective usage pattern. Specifically, research in human-computer interaction (HCI) requires this kind of research since learning management systems (LMS) are the fundamental IT objects for mediating interactions between learners, instructors, and content **(Carswell & Venkatesh, 2002)**.

Research Objectives of the Study

RQ1: What quality factors of Learning Management Systems (LMS) most significantly influence learner satisfaction among LMS users in banks?

RQ2: Does learner satisfaction with LMS influence the LMS course learning effectiveness among LMS users in banks?

LMS quality factors on LMS course learning effectiveness among bank employees at workplace through the model in selected banks with special reference to the Coimbatore district.

The main purpose of the research is to help managers of organisations detect strengths and weaknesses of the LMS platform they are currently running, thus providing them with particular information on the pedagogical and technological implications of the learning measure. LMS is used in Sub-Saharan nations' higher education institutions by adopting and expanding the revised model **(Kishabale, 2018)**. A survey of 200 students enrolled in different courses given via Moodle LMS at the University of Dar es Salaam, Tanzania, was used to validate the suggested model and the instrument. The researchers is working on the model of LMS adoption in Sub-Saharan nations' higher education in assessing their current systems and developing strategies and remedial actions to prevent future LMS failures. **Bashir Kishabale et al., (2018)** focused on instructional design quality framework for successful e-learning with instructional design quality. **Maha Rahrouh et al. (2018)** investigated the application of LMS to deliver courses and as an e-assessment tool to enhance the learning process. Based on efficacy, usefulness, user-friendly interface design, and flexibility in providing online courses, this research analysed educators' perspectives on using Moodle.

Ohliati, J., & Abbas, B. S. (2019) determined the influencing factors like communication, quality for student satisfaction in the learning management system at a private university that has E-learning. A survey of 100 university students participated and the results demonstrated a substantial relationship between information quality, perceived ease of use, service quality, and student discovered that the most important factor influencing the service quality. **Aabha Chaubey et al. (2015)** pointed to the LMS's importance in higher education's cost- effectiveness, access, and flexibility in teaching and learning methodology. To attain the successful learning outcomes, higher education institutions need to integrate the LMS into their teaching and learning process with a variation of learning styles, individualised learning, self-paced learning, and lifelong learning, it enabled users to engage in meaningful learning. Most importantly, it was discovered that learning management systems made learning accessible and encouraged flexibility in learning by allowing for learning to occur at any time and from any location without regard to location or schedule.

Research Hypotheses

Based on this review backup the following null hypotheses are framed:

- H_{01} – Pedagogical design does not influence learner satisfaction with LMS

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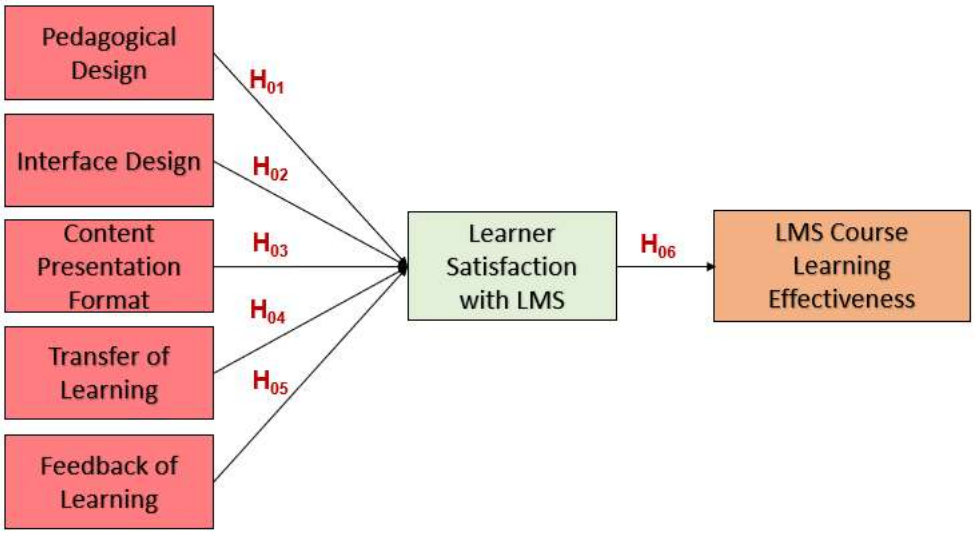
- H_{02} – Interface design does not influence learner satisfaction with LMS
- H_{03} – Content presentation format does not influence learner satisfaction with LMS
- H_{04} – Transfer of learning does not influence learner satisfaction with LMS
- H_{05} – Feedback of learning does not influence learner satisfaction with LMS
- H_{06} – Learner satisfaction with LMS does not influence LMS course learning effectiveness

Figure 1. Learning Management System (LMS) Quality Factors on LMS Course Learning Effectiveness



Research Methodology

Descriptive research design been implemented to finalize the objectives of the research work, as it aims to describe the influence of learning management system (LMS) quality factors on LMS course learning effectiveness at workplace in the post usage context.

A structured questionnaire was developed to collect the primary data from the respondents. The construct or factors are identified from empirical studies. Questionnaire consisted of demographic characteristics of the respondents who are banking professionals. Those characteristics included are demographical profile of the employee experience with LMS, employed in, designation and computer knowledge. Also, the questionnaire evaluated the influence of LMS quality factors such as pedagogical design (6 items), interface design (8 items), content presentation format (8 items), transfer of learning (5 items), feedback of learning (3 items), learner satisfaction with LMS (6 items) on LMS course learning effectiveness (4 items). All the variables were measured on a five-point Likert type scale. The response scale was: 1 = Extremely Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Extremely Agree.

Pilot testing was conducted among 67 Banking Professionals to assess the reliability of the questionnaire. The factors are refined by assessing its reliability through Cronbach alpha and the value obtained was 0.975. Thus, a structured questionnaire was finalized for collecting the primary data.

Sampling Design: Under the category of probability sampling, multi-stage stratified random sampling technique was used in selecting the sample. Banks have been classified as Public and Private. Classification of the banks into stratas is the first stage, second stage is by applying proportionate random sampling

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(lottery method) the branches of the banks are selected according to their proportion, and also equal chances are to be given. In the third stage for the selection of sample units, again random sampling was applied to arrive a sample size of 500. With a population size between 300 to 500 samples (Malhotra and Dash, 2009). Considering the population, various sample size tables, pilot study response rate, questionnaire length and various other studies, 600 questionnaires were circulated through online mode and personal visits to the banks. Only 528 participated in the survey, 54 questionnaires were rejected due to incomplete responses and finally, there were 474 samples found to be usable.

*Data Collection Method and Period***:** Questionnaire has been circulated online in the form of Google forms and personal visits to the banks. The period of data collection was four months.

*Data Analysis Tools Used***:** To analyze the data the tools such as (mean and standard deviation) was used. Furthermore, the research model was executed using Smart PLS 3.

Analysis and Discussions

From the frequency distribution of LMS user demographics, Gender has shown that females have the highest frequency value of 283 (60 percent), while males have 191 (40 percent) frequency values. Between users' age distribution, 49 percent (majority) of them come under the 18–25-year age range. Majority (62%) of the users were graduates. Designation level shows that 32% of the users fall under the category Junior level management grade. Majority (21%) of the users' Work experience, range between greater than or equal to 1 year and less than 3 years. Users' experience in LMS shows that most of them (41%) range between greater than or equal to 1 year and less than 2 years. Majority (59%) of the users are from Private banks. Most of them (39%) have excellent Computer knowledge.

Model Testing and Validation

The PLS-SEM method is helpful in increasing the amount of variation in a dependent variable that can be attributed to an independent variable. The Smart PLS 3 software was utilised to test the proposed study model.

The model testing was done to evaluate the overall model reliability and validity for the factors in (Figure 2).

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Figure 2. Model for Influence of LMS Quality Factors on LMS Course Learning Effectiveness

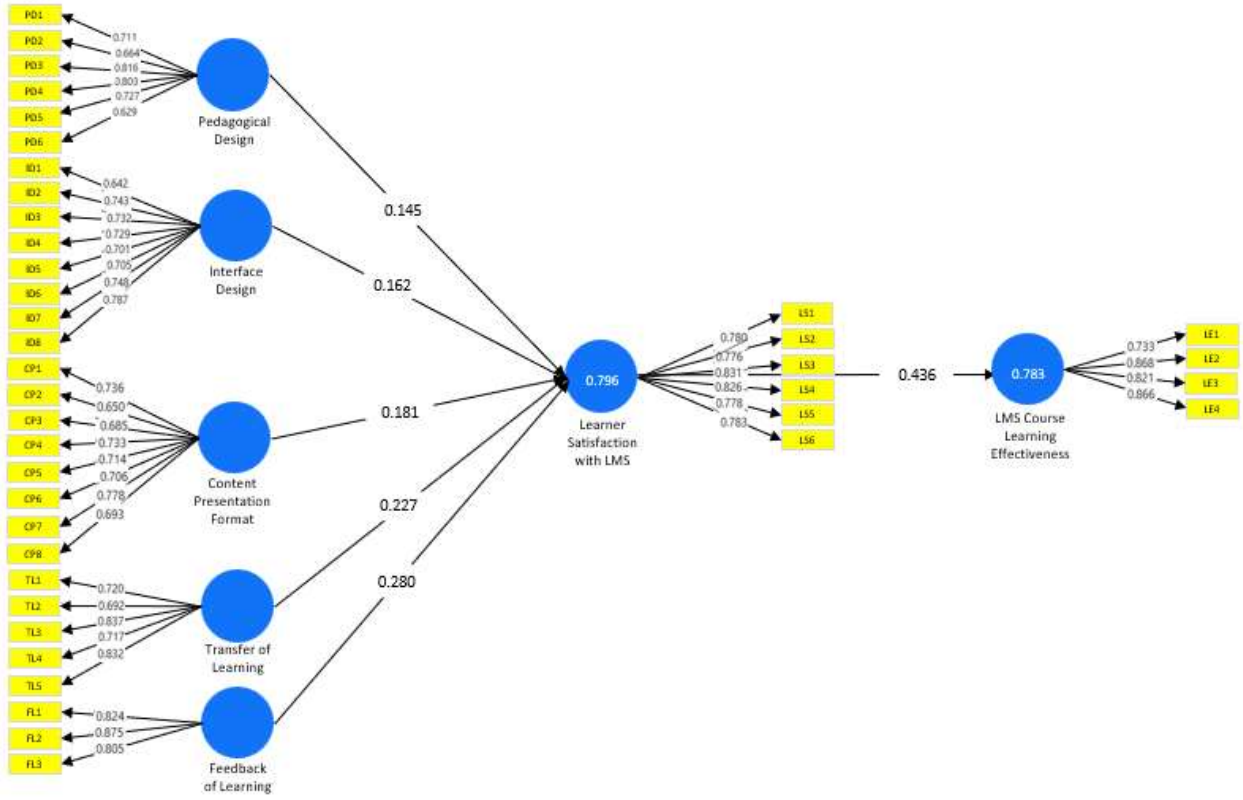

Table 2. Structural Model – Hypotheses Results – Influence of LMS Quality Factors on Learner Satisfaction with LMS and Influence of Learner Satisfaction with LMS on LMS Course Learning Effectiveness

Hypotheses	Path	β- value	t-statistics	Result of Hypotheses
There is no significant influence of pedagogical design on learner satisfaction with LMS	PD ->LS	0.145	1.840	H_{01} Accepted
There is no significant influence of interface design on learner satisfaction with LMS	ID ->LS	0.162	**2.060**	H_{02} **Rejected**
There is no significant influence of content presentation format on learner satisfaction with LMS	CP ->LS	0.181	**2.036**	H_{03} **Rejected**
There is no significant influence of transfer of learning on learner satisfaction with LMS	TL ->LS	0.227	**3.386**	H_{04} **Rejected**
There is no significant influence of feedback of learning on learner satisfaction with LMS	FL ->LS	0.280	**6.311**	H_{05} **Rejected**

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There is no significant influence of learner satisfaction with LMS-on-LMS course learning effectiveness	LS ->LE	0.436	**6.398**	H_{06} **Rejected**

Table 2 analyze the factor pedagogical design, interface design, content presentation format, transfer of Learning and feedback. The evaluation criteria for confirming each hypothesis by applying t-statistics for each coefficient.

Pedagogical Design has no signficance on learner satisfaction (β = 0.145; t = 1.840).with acceptance if null hypothesis. Interface Design has a significant influence on learner satisfaction (β = 0.162; t = 2.060) with rejection of null hypothesis. Content Presentation has signifaicant influence on learner satisfaction with a value of (β = 0.181; t = 2.036).

Transfer of Learning has a significant influence on learner satisfaction (β = 0.227; t = 3.386). Feedback of Learning has a influence on learner satisfaction (β = 0.280; t = 6.311). Learner satisfaction with LMS has a significant influence on LMS course learning effectiveness (β = 0.436; t = 6.398). Hence the null hypothesis is rejected.

Conclusion

Employees may get the information and skills they need to complete their work activities from anywhere at any instance with learning management system (LMS). Usability must be investigated to improve the use of LMS for employee training, however this component is often overlooked. The usage of LMS by specific users is to achieve specific goals effectively, efficiently, and satisfactorily in a specific context is known as usability, and if e-learning systems have poor usability, users may spend more time learning the system rather than the content it delivers. To analyze the above usage issues, this study concentrated on the LMS quality factors those proved the LMS course learning effectiveness among its users. Despite the widespread adoption of e-learning in most businesses, empirical research into the different aspects that influence the efficiency of LMS course learning has been limited. The goal of this research is to close the gap. As increasing capacity of the LMS being high but the users are not that much upskilled. It is still necessary to modify the LMS quality factors to the needs of individual learners in order to make learning enjoyable and achieve desired learning outcomes. By categorizing determinant LMS quality factors into pedagogy, content, interface, feedback, and transfer of learning, the study findings can give designers of corporate education systems with more integrated and complete insights on determinant LMS quality aspects.

Directions for Future Research

In future this research can be conducted utilizing longitudinal studies to identify the effectiveness of LMS course learning through LMS quality factors. The instructor's perspective on the LMS platform to gain a more profound knowledge of the effectiveness of the LMS course for the learners. Research of a similar nature might be carried out among respondents from a variety of workplace settings and being employed by a variety of businesses, all of which use LMS platforms for various purposes (such as upskilling, reskilling, training and development, etc.).

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