A Review Of Learning Management System Enhanced by Gamification Through Push Pool Mooring Model

By Eddy Triswanto Setyoadi

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Eddy Triswanto Setyoadi[1], Syaad Patmanthara[2], Heru Wahyu Herwanto[3], Hartarto Junaedi[4], and Titasari Rahmawati[5]
Correspondence author: syaad.ft@um.ac.id
[1,2,3]Department Of Electrical Engineering and Informatics, Universitas Negeri Malang, Indonesia
[1-5]Department of Information System, Institut Informatika Indonesia Surabaya, Indonesia
[4]Department Of Information System, Institut Sains dan Teknologi Terpadu Surabaya, Indonesia

INDEXING	ABSTRACT
Keywords: Keyword 1; Push Pool Mooring Perspective Model Keyword 2; Educational Keyword 3; Learning Management System Keyword 4; Online Learning Platform Keyword 5; Gamification Keyword 6; Motivation	The COVID-19 pandemic has led to the rapid expansion of online learning programs in higher education, enabling students to access and study course materials independently. The Learning Management System (LMS) is pivotal in supporting this transition. Incorporating gamification elements such as leaderboards, levels, point systems, and badges into LMS platforms can yield mixed effects on learning outcomes. While gamification has shown potential to enhance motivation, and engagement, and create a competitive yet enjoyable learning environment, it can also result in increased stress, demotivation, and distractions if not implemented thoughtfully. This research aims to evaluate the efficacy of gamified LMS platforms by applying the Push-Pull-Mooring (PPM) Perspective Model. The study seeks to understand the factors that influence students' transition from traditional LMS to gamified systems, including motivations (pull factors), dissatisfactions (push factors), and inhibitors (mooring factors). By systematically reviewing 30 scholarly articles published between 2012 and 2022, the research provides insights into the psychological, behavioral, and educational impacts of gamification within LMS environments. The study aims to identify best practices for designing and implementing gamified LMS that maximize positive outcomes such as intrinsic motivation and active participation while mitigating potential downsides. Furthermore, it explores the implications of gamification for improving educational outcomes and informing future technological innovations in e-learning.

INTRODUCTION

The COVID-19 pandemic has led to the creation of several learning programs. The implementation of physical distancing restrictions causes teachers to adapt to the way of learning anywhere and anytime which leads to the use of technology as a solution for effective learning (Patmanthara et al, 2023). One of the major issues facing the current industrial revolution 4.0 is education, which presents a challenge for the educational community. The first difficulty is preparing the millennial generation of aspiring teachers for the period of the fourth industrial revolution with competencies that are relevant and qualified. The second difficulty is how to design instruction that considers the most recent advancements in information and technology (Ferdiansyah et al, 2022). So in this

problem, educational institutions must be able to innovate in the online teaching and learning process, they need unlimited sources of imagination. Maintaining outstanding service while continuously transmitting essential knowledge is the goal of necessary expertise. Although it requires a solid internet connection and a reliable educational media infrastructure, online education encourages independence and allows students to absorb knowledge as fully as possible (Kang et al., 2021a). Currently, untilizing online learning platforms such as Learning Management Systems (LMS) is the only critical component that influences the process. Online learning presents challenges during the learning process in addition to helping students become more self-reliant (Hidayat et al, 2024).

Children have experienced a significant psychological impact from the COVID-19 pandemic's shift to LMS. The sudden switch from an in-person classroom to an online one has influenced students' psychological health, leading to feelings of isolation, fear, and disconnection from the outside world. In addition to challenges in gaining access to online learning due to device and network issues, students' levels of anxiety and despair have grown due to a lack of social support and in-person connection (Hasan & Bao, 2020). According to (Xie & Derakhshan, 2021), he still has certain teachers who make him attend Zoom sessions daily, which frustrates and bores him. Besides that, Online education changes have affected students in ways including making them more confused, making them passive, making them less creative and productive, making them feel stressed, and making them less motivated to learn (Hidayat et al, 2021). According to other studies, online learners have trouble focusing during lectures and are more likely to engage in unrelated activities like social media use. There are numerous reasons for this. First, the Control-Value theory claims that students become bored and turn their attention to other engaging activities when they feel the lecture topic is less relevant and fascinating. Students may feel less in control of their participation and academic achievement because online lectures are different from traditional classroom settings. For instance, if there is a bad internet connection, learning could be more difficult. Third, since the teacher or lecturer does not fully comprehend their participation, students may undervalue their assignments in an online setting. Teachers and lecturers cannot make eye contact with students as they cannot in traditional classroom settings, nor can they pose probing questions to keep students interested and minimize boredom (Mishra et al., 2020).

Research has demonstrated that learning management systems improve students' performance and comprehension across a range of courses. For instance, it has been demonstrated that LMS platforms enhance students' comprehension of geometry in high school, their aptitude for arithmetic, their performance on language tests, and their online academic achievement (Liao et al., 2019).

According to a study by (Rau et al., 2019), learning management systems (LMS) can benefit students, particularly terms of their psychological well-being, specifically in terms of learning motivation and engagement (Rau et al., 2019). Intrinsic motivation is the term used to describe the internal incentive that exists among students. Additionally, from a psychological standpoint, online learning can enhance students' contentment and mental health since it provides them with the learning resources they want—that is, resources that are more adaptable and available anywhere.

It is crucial to remember that depending on the kind of individualized learning, the effects of online learning on students' psychological health may differ. Online learning platforms might not be the most efficient and appropriate option for students with their learning styles because different people learn in different ways. This implies that individual differences in learning styles may have an impact on the psychological effects of online learning (Lim et al., 2022).

Making sure the learning environment is engaging is a crucial factor to consider with this transition. These constructs can be used to convey learning in a variety of ways that make it more engaging. Using games for educational purposes is one such method (Filippou et al., 2018). Giving consumers a fun and addictive gaming environment to utilize while performing non-gaming tasks is known as the gamification of non-gaming systems. Modeling can take the shape of adding features to games such as leaderboards that encourage friendly competition between users or a point, level, or badge system that marks the completion of tasks (Park & Kim, 2021).

Gamers build gameplay dynamics by interacting with game mechanics like points gained and missions completed. Players also play it for emotional and aesthetic reasons, such as the desire to win the competition. According to (Capdarest-Arest et al., 2019), most gamers, or users as they are frequently called, feel pressure to do well or to show others that they can finish a task. The explanation of gamification leads one to the conclusion that it can elevate user emotions, present challenges, and create a pleasant environment.

Gamification of education, and specifically the learning process, has taken center stage. What sets this apart is how gamification is integrated into the Learning Management System (LMS). Gamification has been demonstrated to have a positive impact on active learning, with points enhancing student performance, badges boosting active participation, and leaderboards encouraging students to participate in online classrooms (Raharjo et al., 2021). Further research describes how avatar aspects can be added to user profiles, navigation bars, and assignment upload systems in gamified learning management systems. The task upload system with gamification aims to set deadlines and reward the timely completion of assignments with incentives. (Azmi & Singh, 2015).

But not all gamifications, especially in virtual learning environments, can yield noticeable benefits. Abuse of gamification is possible in educational settings; one such instance is when users become focused on gamification to the point of being sidetracked from their studies. In gamification-based online learning environments, cheating can also happen since users are overly driven to attain the highest possible score. However, there isn't much research on the topic of gamification misuse in the form of literature (Saleem et al., 2022). Three components of a gamification model—a leaderboard, badges, and competition—can also hurt users, including decreased performance, demotivation, and stress. Additionally, it can lead to confusion among learners, as many students are unaware of the number of points needed to pass (Almeida et al., 2021).

Studying the elements influencing the intention to use, in this example, a gamification-based learning management system (LMS), is essential given the impact of gamification applications, particularly in the online learning environment. One of the

trustworthy tools for identifying the factors that push users away from using gamification-based learning management systems (LMS) or current technology is the push-pull-mooring Perspective Model (PPM). It can also be used to identify the factors that draw users to newer technologies, which in this case are factors that draw users to the existence of LMSs based on gamification. Human movement from a starting place to a new destination is described by the Push-Pull-Mooring Perspective Model (PPM) theory. Push, pull, and Mooring effects are the three primary factors that the theory identifies as influencing migration decisions. The Pull Effect describes the advantages of the new place that draws people in, whereas the Push Effect describes the drawbacks of the existing site that compel individuals to relocate to a better location. Nonetheless, social, and personal elements that affect people's decisions to relocate or not are correlated with the Mooring Effect (Lisana, 2023).

To comprehend the elements influencing learners' behavior throughout the shift to online learning, the Push-Pull Mooring Perspective Model (PPM) has been employed. According to (C. L. Lin et al., 2021), this model illustrates the following three types of effects: the Mooring Effect, which includes changes in costs and previous habits; the Pull Effect, which includes friendliness, ease of use, teacher and learner attitudes toward teaching, and suitability of tasks with technology; and the Push Effect, which includes perceived security risks, learning convenience, and service quality.

LITERATURE REVIEW

To examine students' transition from earlier learning management systems to gamification-based learning management systems, this section offers a thorough assessment of the literature on recent studies on gamification-based learning management systems and PPM frameworks.

A.   Learning Management System

The creation of educational media is one-way that technology may contribute to education (Soraya et al, 2023). The creation of educational media is one way technology can contribute to education. The technology in question can be in the form of a web-based interface that facilitates the transmission of educational materials, arranges learning procedures, and permits interaction between educators and students in the context of the research that is presented. Through separately integrable e-learning modules, it is utilized in academic education as a supplement to in-person classes and is meant to enhance information transfer. LMS is the main tool used in the execution of blended learning courses, which integrate online and in-person instruction. Compared to traditional teaching and learning arrangements, these systems demand stronger technical competencies and a higher level of self-discipline from their students. An essential instrument for integrating e-learning into educational processes, learning management systems (LMS) provide a range of functions to support e-learning, such as self-test components, discussion forums, and content management (Felea et al., 2018).

The use of electronic devices to access educational courses outside of a typical classroom is known as e-learning, on the other hand. Most of the time, it entails taking classes online through an LMS. A vast range of procedures, including web-based learning, virtual classrooms, computer-based learning, and digital collaboration, are collectively referred to as e-learning. According to (Kim et al., 2017), it includes content

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that is provided by satellite TV, CD-ROM, audio or video cassette, intranet/extranet, and the internet.

E-learning is a type of interactive remote learning where educational resources and content are delivered over an online platform. Instantaneous access to instructional materials and prompt feedback on students' learning engagement are made possible by online learning systems. Learners can access up-to-date resources and state-of-the-art technology through e-learning, which can overcome time and location limitations. It also promotes better communication and involvement between teachers and students. With an emphasis on an adaptive and personalized e-learning environment, the use of e-learning has greatly improved students' ability to develop customized learning solutions (Meskhi et al., 2019).

B. Pull Factor

The pull effect is related to the advantages that the new location or platform offers and draws people to it. The pull effect in the context of learning management systems (LMS) refers to the qualities and advantages of the machine learning (ML) platform that attract students and encourage them to choose it over conventional teaching techniques. Learning autonomy and perceived enjoyment are two important pull variables (Lisana, 2023).

Students are more likely to embrace online learning when they have control over the process and may learn at their own speed and style. This is known as learning autonomy. On the other side, perceived enjoyment—which has the potential to persuade students to switch to machine learning is the delight and contentment that come from utilizing the ML platform. (Afacan Adanır & Muhametjanova, 2021) Emphasized that these aspects are crucial for comprehending the dynamics of technology adoption and for creating more engaging and effective machine learning systems that cater to students' wants and preferences.

C. Push Factor

The drawbacks or shortcomings of the existing circumstances that force people to look for alternatives are referred to as the push factor. The capacity of students to complete learning activities without being constrained by time or space is known as learning convenience in the context of Learning Management Systems (LMS). The discomfort of being present in physical classes is a factor that influences university students' decision to transition from attending in-person classes to using online learning platforms (Chao, 2019).

The term "push factor" describes outside rewards or circumstances that force or inspire students to interact with learning management systems (LMS) and online courses. The use of test items performance evaluation within an LMS, where answering these questions accurately could be credited as bonus points for exam performance, is one instance of a push factor that was cited. Most students rated this module as "very motivational" to "motivating," indicating that extrinsic reward incentives like the chance to earn bonus points act as a strong motivator for learning at the individual student level. This suggests that students may be encouraged to interact more actively with LMS and e-learning content through incentives from outside sources and the possibility of academic gain (Salimon et al., 2021).

D. Gamification in Online Learning

Gamification, however, can have a variety of effects on online learning environments. Both favorable and unfavorable effects. According to (Alsadoon et al.,

2022), gamification in online learning has no discernible effect on student learning outcomes. Learner motivation is not significantly impacted by the introduction of badges and leaderboard components in learning systems (Almeida et al., 2021). According to (Antonaci et al., 2019), learners may mistake the inclusion of gamification components like leaderboards and badges as a means of gaining attention.

In online learning, gamification is used to boost student engagement, enhance learning objectives, and favorably affect attitudes about learning. It entails incorporating gaming features into an instructional setting, such as leaderboards, challenges, badges, points, and feedback. These components can enhance student participation in the learning process by making it more enjoyable and interactive (Romero-Rodriguez et al., 2019). Additionally, gamification can offer instant feedback, enabling students to monitor their development and identify areas in which they still need to improve (Aguilos & Fuchs, 2022). Additionally, it can encourage students to work together and compete, which will boost their motivation and engagement even more. However, depending on the precise game features employed and how it is applied, gamification's effectiveness in e-learning might vary (Facey-Shaw et al., 2020).
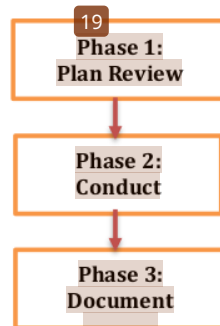
RESEARCH METHOD

In this study, (Carrera-Rivera et al., 2022) used the Kitchenham SLR approach to ascertain how each work presents the impacts of e-learning and gamification. The opening, choosing the title and abstract, and choosing the entire paper are the steps in this process. Created for use in the medical area, this technique has since been expanded to other fields, including computer science (Kitchenham & Brereton, 2013).

Planning, structuring, and results are the three easy steps in the Kitchenham SLR technique (Sauer & Seuring, 2023) that a literature review follows (Moon, 1995). These phases included every step of the literature review procedure, from planning to creating the study's result. Every move made during each phase of the current inquiry is shown in Figure 1.

The first step in the planning process was to decide on the review questions and set the aim. The purpose of the current study and the review questions are included in the Introduction section. A detailed explanation will be provided in the areas that follow building the view protocol, selecting pertinent databases, and utilizing keywords.

Before the study's commencement, the research review procedure was selected and created. The primary criterion for assessing whether a publication satisfied the goals of the research was its review protocol, which was followed at every level of the inquiry. The protocol for review is shown in Table 1.

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│    Phase 1:       │
│   Plan Review     │
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│    Phase 2:       │
│    Conduct        │
└──────────────────┘
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┌──────────────────┐
│    Phase 3:       │
│   Document        │
└──────────────────┘
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Figure 1. SLR Process Proposed By Kitchenham
(Kitchenham, B., & Brereton, P. (2013)

The beginning step began with creating a string query to seek papers across the selected databases. The chosen term formed a query that was matched by the research goal, a synonym, or another relevant phrase (learning management system, especially). The terms "e-learning", "Online learning", "learning management system" and "Education" AND "Gamification" were developed as a string query specifically for this study. The query's years were limited to 2016 to 2023. This period was selected to evaluate the most current developments in the e-learning industry. Subsequently, a defined string query was employed to comb through a selection of databases that were deemed pertinent to the objective of this investigation.

A.   Research Questions

The research questions (RQ) of SLR are outlined in Table 1

Table 1. Research Question Slr

RQ1	How the variables from the Learning Management System (LMS) Push-Pull-Mooring Perspective Model produce the required hypothesis
RQ2	The Push-Pull-Mooring Perspective Model can be used to explain the factors that motivate users to abandon learning management systems in favor of gamification-based LMSs with reward systems, as well as the factors that draw users in and encourage them to do so. Additionally, the model can be used to explain the Mooring Effect factors that prevent users from adopting new technology, specifically LMSs that are gamification-based and have reward systems.
RQ3	Do the Mooring Factor and Past Experience Have an Influence?

B.   Search Protocol

In this work, we employed the following combination of automatic search in Scopus and backward snowballing:

1.   For IC and EC, we specified the terms given in Table 2.
2.   The year that the ground-breaking research on an evidence-based learning management system was released is the reason we selected 2019 as the launch year. The chosen papers needed to meet every IC requirement, but not every EC one.
3.   IC1 served as a guide for the search string definition, and after some trial and error, it was identified as a "tertiary study." During the process, we also changed the Scopus search parameters. The parameters that were used to implement IC2, IC3, and IC4 were Subject Area and Publication Year, accordingly. We used the title, keywords, and abstract as our search parameters.
4.   On January 19, 2019, after searching Scopus with the specified query, 101 candidate papers were located.
5.   We applied IC1, IC2, and the EC to the title, abstract, and keywords of these 115 manuscripts; 55 of them were disqualified.
6.   After the data was extracted, we removed 10 publications whose full texts showed that they had failed to meet an IC or an EC.
7.   In the end, we discovered 3 more papers by using the 60 selected papers as a starting point for backward snowballing and applying IC/EC to them.

IC/EC	Inclusion Criteria	Exclusion Criteria
1	Match Search Query	Unmatched Search query

2	English	Other than English
3	Published Around 2019-2023	Published outside 2016-2023
4	Published in Scopus, WoS, Springer	Not Published on Scopus, WoS, Springer

A selection procedure that adhered to the review procedures resulted in the identification of 50 papers as eligible for the current investigation. The study's aims would gather data from selected articles, mainly about each paper's learning management system or e-learning technology.

C. Data Extraction, Analysis and Reporting

A GDrive spreadsheet held the search results for future examination. The selected papers are designated with the numbers [S01]–[S50]. Rejected letters are recorded by us. We add as many columns as necessary to retrieve the data needed to answer RQs 1 through 4.

Using content analysis, we inductively synthesized codes from the retrieved data and classified them. Three steps are generally taken to prevent researcher bias: first, we create a list of all the papers we locate in Microsoft Excel; second, we create a list of categories based on the selected subject; and third, we arrange the papers into the appropriate categories.

RESULT AND DISCUSSION

Based on the results of the previous stage, thirty papers are relevant to the purpose of this review study. The explanation was split into two sections based on the objectives: the current use of learning management systems and the push, pull, and anchoring effects.

A. Push Factor

Push Influence encourages users to stop using the services they are already using, which is a negative outcome. In the PPM model of demographic migration, push effects are characterized as specific adverse factors that reduce an individual's standard of living and encourage people to relocate (Heckel & Ringeisen, 2019). When the benefits of staying in the original residence are larger, the motivation to switch is reduced. Push effects, as they are referred to in this study, are the negative consequences on the quality of interactions or learning that lead students to switch to a different learning platform.

Because they are more likely to think well of the learning platform, students are also less inclined to switch to another one even if they think it offers more enjoyment value. Furthermore, if an online learning platform or learning management system provides a better experience, students are willing to use it. When learners are completely involved in the learning environment, they are more likely to feel in control of the process and to encourage frequent use. Increased platform participation promotes comfort in learning and, in some circumstances, can develop into dependency (Girish et al., 2022). However, if a student finds a learning platform unsatisfactory, they could decide to switch to another in the hopes of discovering one that they love using more.

In the context of online learning, perceived risks are any possible security-related problems that could interfere with online activities. It has been demonstrated that these hazards have a detrimental impact on people's attitudes about and intentions for conducting online learning. Subjective standards and perceived behavioral control, however, do not appear to be impacted by these perceived dangers. This implies that students can distinguish between the apps or businesses they use for online learning and those that are experiencing security issues. The respondents do not believe that online learning is dangerous, despite some depressing news regarding the security of well-

known video conference apps and well-known electronic marketplace providers. The utilization of online learning is unaffected by perceived risk, despite being slightly considered and impacting the intention to use it. Users' propensity to engage in online learning decreases with increasing perceived risk (Liao et al., 2019). Service quality in a Learning Management System (LMS) is the efficiency with which a user is helped and supported. Examples of this include a sincere focus on problem-solving, personalization, trust, and an understanding of the needs of each user. It is essential to determine the level of engagement and satisfaction that students have with their online education. According to (Uppal et al., 2018), providing excellent service can boost students' happiness and engagement, which motivates them to continue their studies and succeed in the process. Service quality is a reliable metric for evaluating quality of service in several areas, including education. Furthermore, it has been found that the information, system, and service attributes have a significant impact on student engagement and satisfaction. Therefore, maintaining a high standard of service quality for an LMS is crucial for the success of online learning (Liao et al., 2019).

B. Pull Factor

Decisions related to demographic migration involve residents being lured to a place that provides a better quality of life. If alternative learning platforms provide superior instruction or more engaging interactions, learners might also consider switching to one of those.

Learners may be enticed to transfer platforms in search of features unavailable on their current platform, like migrant workers moving to a new place in search of better employment or educational prospects (Chang et al., 2014). One important factor influencing users' inclination to use an e-learning system is perceived ease of use (Jung & Shin, 2022, Raza et al., 2020). According to (Salimon et al., 2021, Lo Presti et al., 2021, Al-Rahmi et al., 2021), perceived ease of use has a significant impact on the intention to use LMS.

Perceived usefulness, according to Davis (Daneji et al., 2019), is the degree to which a person believes that using a certain system will enhance their capacity to carry out their duties. The two factors that determine behavioral intention to use based on TAM are perceived usefulness, the belief that using the system can increase performance, and perceived ease of use, the perception that utilizing the system is not difficult.

The pull effect in the context of learning management systems (LMS) and e-learning may be influenced by factors such as personal interest in the subject matter or the satisfaction derived from interacting with immersive and interactive e-learning modules. These components, as opposed to external incentives like grades or awards, can significantly enhance the learning process by raising the possibility that students will interact with the material out of a sincere desire to learn and explore. Giving pupils a sense of accomplishment and advancement through e-learning modules that show individual learning progress, and the use of digital learning badges is one way to engage their intrinsic motivations. These elements can contribute to the pull effect by raising student engagement in the learning process and providing them with personal incentives (Rau et al., 2019).

Perceived usefulness is the term used to describe the belief that utilizing technology will raise the standard of one's work. Users will consequently be more willing to use an e-learning platform if it offers greater benefits, according to Aisha et al (Al-Qaysi et al., 2021). Comparable studies have been conducted in Jordan to investigate students' perceptions of the mobile learning platform (Afacan Adanır & Muhametjanova, 2021). The results show that mobile learning is one of the instructional technologies most likely

to advance in academic contexts. It is further noted that students view online learning platforms as beneficial and user-friendly when they understand that they enhance their performance and success by facilitating their overall learning productivity. There is a difference between m-learning and e-learning. Mobile learning is one aspect of e-learning (Alamri et al., 2020).

The TTF model is based on the relationship between task specifications and technology attributes. According to the concept, measuring the uptake of technology necessitates more than focusing only on what pupils anticipate from it. Students will embrace technology if they believe it is competent enough to complete their everyday duties (Navarro et al., 2021). This theory's paradigm makes sense of the practical applications of technology. Because focusing solely on consumer expectations of technology is insufficient, the task-technology fit (TTF) model predicts when users will employ a technology based on a link between performance expectations and technology attributes (Sun et al., 2017).

C.   Mooring Effects

Making migration decisions is difficult. The tether effect can lessen the impacts of tugging and pushing. According to this research, anchoring effects are extra variables that, depending on a person's social or personal environment, might help or hurt their decision to switch. To be more precise, this study suggests that affective commitment and habit serve as the origins of affective, cognitive, and subconscious anchoring effects. These elements are thought to be significant sources of inertia or how these anchoring variables affect users' intentions to move between applications (Xu et al., 2021, Li, 2018). The term "affective commitment" describes a target's emotional attachment, identity, and participation and indicates a willingness to stay in the relationship. Research indicates that affective commitment plays a significant role in determining users' intentions to continue using online learning platforms. This is because affective commitment fosters emotional attachment and a sense of community among users, which makes it easier for them to maintain relationships with current services.

Habit is one important aspect that affects consumers' inclination to switch. More specifically, consumers who become accustomed to a certain service are less likely to carefully consider, compare, and choose a more advantageous option—rather, they will likely continue with what they are accustomed to. Research on customer behavior when it comes to switching services has revealed that clients get inert with their present providers and opt to maintain the "transaction relationship" with them to some degree rather than actively looking for new services (Chen & Keng, 2019). Unlike inertia, which is the deliberate maintenance of the status quo in the face of better options, habit is cognitively efficient and allows people to sustain the current quo automatically (Yuen et al., 2019). Construction of Push-Pull-Mooring Perspectives The model is shown in Figure 2 for a more thorough examination.
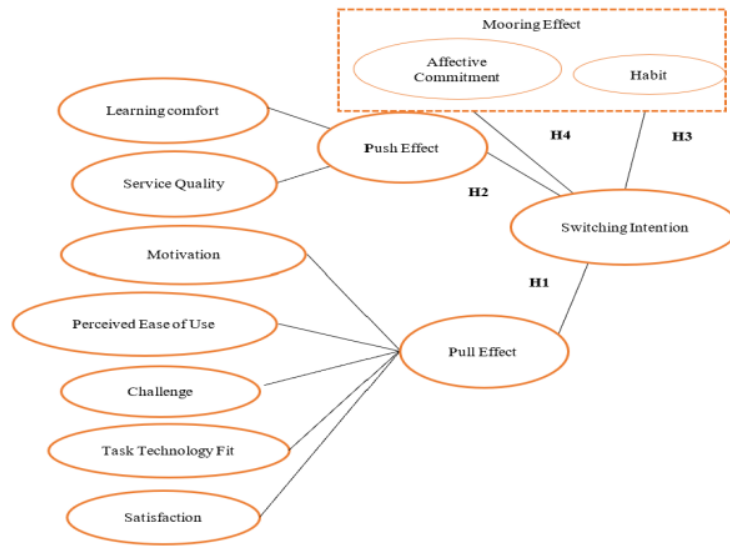
Figure 2. Proposed Push-Pull-Mooring Construction Perspective
(Delone & Mclean,2003, Lu & Wung, 2021, Al-Hunaiyyan, 2021, Pramana, 2018,
Alyoussef, 2021, Chao, 2019, Pahnila Et Al, 2011, Xu Et Al, 2021)

D. The Trend Of Learning Management System

The goal of the study, "Designing Gamified Learning Management Systems for Higher Education," conducted by information systems specialists (Limantara et al., 2022), is to create a gamified learning management system (LMS) for higher education. To improve student motivation, engagement, and performance, the authors suggest a paradigm that combines the HEXAD Framework, Werbach and Hunter's Six Steps of Gamification, and the MDE Framework. This study emphasizes how crucial it is to consider several variables when designing gamification systems, including target behavior, player type, activity cycle, enjoyment, and corporate objectives. According to the author, gamification in an LMS can enhance student performance and learning outcomes.

This study highlights the importance of meaningful gamification experiences and investigates how gamified instructional resources affect STEM students' intrinsic motivation. Subsequent investigations will evaluate the effects of gamified settings on the motivation, engagement, perspective, and learning performance of students (Murillo-Zamorano et al., 2021). The field of education, and particularly the learning process, has been dominated by gamification. This is demonstrated by the Learning Management System's (LMS) incorporation of gamification. With leaderboards encouraging students to actively participate in online classes, badges enhancing active participation, and points increasing student performance, the implementation of gamification has been shown to have a good impact on active learning. Combining avatar features with navigation bars, assignment upload systems, and user profiles in gamified learning management systems is also covered in another research. Setting a time limit and receiving prizes for finishing the assignment within the allotted time is the goal of the task upload system with gamification (Díaz-Ramírez, 2020). as in the studies that Amina, Suhartono, Velia, and Bernik carried out. A thorough overview of the literature on learning management systems is covered in the study. This investigates gamification's application to e-learning

platforms in higher education. It lists leaderboards, badges, and points as the most popular game components but doesn't provide any theoretical foundations for gamification.

The review classifies approaches according to four criteria: kind, depth, validation, and detail. The study suggests that although gamification is a popular topic, most of the applied research employs machine learning techniques without any theoretical underpinnings. Subsequent investigations ought to concentrate on educational elements, student profiles, and confirmation of statistical analysis. Aside from that, this study investigates how gamification might be used to teach e-learning skills in virtual learning settings. A comprehensive body of research was reviewed to comprehend the efficacy of gamification in the classroom. Its application in many educational contexts, platform licensing, and teaching language are highlighted by the research. According to the study's findings, gamification has the potential to improve learning outcomes, motivation, and engagement in online learning environments. This suggests more areas for investigation and advancement. (Jayalath & Esichaikul, 2022, Khaldi et al., 2023, Kang et al., 2021b, Venter, 2022).

Elham's research also discusses the consequences of gamification. The purpose of the study is to determine how gamification affected computer science students' motivation, performance, and overall experience during the COVID-19 pandemic. Students are motivated and given immediate feedback using leaderboards, levels, and point badges. The study also emphasizes how critical it is to support communication and teamwork in online learning. Gamification boosts students' motivation and performance even when it has no discernible effect on their performance. The study makes the case for the creation of digital tools for online learning as well as more controlled learning environments. It adds to the body of knowledge regarding gamification in the classroom (Alsadoon et al., 2022). According to (Antonaci et al., 2019), learners may mistake the inclusion of gamification components like leaderboards and badges as a means of gaining attention.

A gamification-based learning management system (LMS) has been shown to boost student motivation, but there isn't much proof that it has a major influence on enhancing student learning results, based on this discussion. Along with many other factors, motivation is a key internal factor that affects students' academic success. A person should possess six important character traits, and motivation is one of them, according to (Panisoara et al., 2020). According to (Panisoara et al., 2020), incentives can originate from both internal elements seen in learners and external factors like social effects or external stimuli.

Beyond the inherent features of learners, external factors also have a significant role in influencing the fate of learners in online learning (Morgado et al., 2021). A student who lacks external support such as a comfortable atmosphere or facilities, social recognition, or other external factors will also have poor learning results. This is especially true if the student has high levels of desire, determination, interest, and confidence. (Mafulah et al., 2023).

A mobile application that gamifies learning to give pupils a better educational experience. The program will have features including scoreboards, ranks, badges, interactive study cases, achievement reports, and video-based forums. To create an engaging learning environment, gamification in mobile applications refers to the integration of game features. During this process, the target audience must be understood, learning objectives must be defined, content and activities must be created, game elements must be added, interactive features must be designed, a user-friendly interface must be created, feedback mechanisms must be incorporated, and iterative development and testing must be carried out using a System Development Life Cycle approach. The

application can successfully improve university students' educational experience by customizing the gamification aspects to their preferences and learning methods. To monitor advancement and maintain motivation, the app should also have feedback features (Sanjaya et al., 2020). In research conducted by Ana et al, the 5W2H framework is a user-centered approach to gamification in e-learning systems, aiming to enhance student interaction, engagement, and satisfaction. It was applied to an adaptive educational hypermedia system for an online algorithms course. Students reported positive experiences with the system, particularly appreciating game elements like leaderboards, challenges, and rewards. The study suggests future research in different e-learning contexts (Carolina et al., 2019).

Students need to have a certain level of ICT proficiency, or digital skills, to use gamification-based learning programs. Regarding perceived utility, perceived ease of use, intention to use, and actual use, there are statistical disparities among participants with varying degrees of digital (Panagiotarou et al., 2020). They worked together on gamification-based and inductive learning Gamification and inductive learning are two different ideas in education.

Gamification is the process of using game design features to enhance the dynamic and engaging nature of learning, whereas inductive learning involves learners drawing general principles from specific examples. Combining these strategies can increase learning motivation and efficacy, but careful application is required to make sure they don't take away from the learning process. While gamification aims to make learning more dynamic and entertaining, inductive learning is useful for teaching complicated topics (Modirrousta-Galian et al., 2023).

This discussion leads to the conclusion that while the gamification-based system's (LMS) reward component has been shown to boost student motivation, there isn't any proof to suggest that it significantly enhances learning outcomes for students. In addition to extrinsic sources like social influences or outside stimuli, intrinsic variables within the learners themselves can also serve as sources of motivation. No less significant than the intrinsic variables of the students are the external aspects that impact their success in online learning.

Students in traditional learning management systems (LMS) often face psychological strain as they adjust to utilizing the LMS as a medium, tool, or resource in the learning process. Students also feel frustrated because, before the concept of gamification, learning management systems (LMS) solely valued overall student achievement (C.-L. Lin et al., 2021, Modirrousta-Galian et al., 2023, Carolina et al., 2019). The psychological health of students participating in online learning is contingent upon or impacted by their learning objectives and orientation (Alomyan, 2021).

A student's learning will also be hampered if they possess strong willpower, curiosity, belief, and ambition but do not receive external help in the form of a welcoming environment or facilities, teachers' attention and motivation, social recognition, or other external variables. As a result, a more thorough analysis of the effects of learning with a learning management system must be done in future research, and the analysis's findings will serve as the foundation for creating gamification within the system. Students must be tested on the gamification design to determine what elements will encourage them to switch from prior e-learning to the newly created gamification-based e-learning. Therefore, the limitations that prevent students from switching to gamification-based e-learning might be minimized in the next study.

CONCLUSION

The main conclusions and contributions of the research articles listed in the preceding sections are summed up in the paper's conclusion. It highlights how crucial it is to comprehend what influences students' behavior while switching between online learning platforms, especially when gamification is involved. It is determined that the push-pull-mooring model provides a helpful foundation for comprehending these dynamics. The research articles shed light on how students' involvement and desire to switch are affected by gamification preferences, instructor communication styles, e-learning implementation difficulties, and freedom.

To lessen the detrimental effects of online learning, especially during the COVID-19 pandemic, this article addresses the creation of a gamified learning management system (LMS). Using the Push-Pull-Mooring (PPM) paradigm, the study seeks to identify the variables influencing students' intentions to move from traditional to gamified learning management systems. The study notes that although gamification in learning management systems (LMS) can increase motivation, engagement, and student satisfaction when done well, it can also lead to psychological stress when learning online. On the other hand, gamification done badly might backfire.

The study cites several studies on the benefits of gamification on student engagement and learning, the psychological consequences of online learning, and the variables influencing LMS user adoption and satisfaction. It also looks at how gamification is used in subject areas like STEM and AI education.

Overall, the study indicates that even while gamification has the potential to enhance learning outcomes and student engagement, further research is necessary to completely comprehend its advantages and drawbacks and to provide guidance for the creation and application of gamified learning environments.

The articles also cover the possible drawbacks of gamification and stress the significance of considering aspects like task-technology fit, perceived utility, and perceived simplicity of use while using LMS. It emphasizes the potential of the push-pull-mooring model to comprehend students' switching behavior in online learning platforms and concludes that more study is needed on gamification-based learning management systems.

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