

Exploring the Influence of Learning Management System Constructs on Student Satisfaction and Academic Performance.

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Abstract

This study investigates the influence of learning management system (LMS) constructs on student satisfaction and academic performance within the context of Chennai city. The LMS constructs under examination include instructional quality, technology quality, course quality, and ease of use. Additionally, the study explores the relationship between student satisfaction with the LMS and their academic performance specifically in the educational institutions of Chennai city. The objectives are to assess the impact of LMS factors on student satisfaction and to examine how student satisfaction with the LMS correlates with academic performance in the unique urban environment of Chennai. Key findings reveal significant correlations between instructional quality, technology quality, course quality, ease of use, and student satisfaction with the LMS. Specifically, findings indicate that higher perceived instructional quality, better technology infrastructure, course design, and ease of navigation within the LMS positively impact student satisfaction. Furthermore, the study uncovers a strong positive relationship between student satisfaction with the LMS and academic performance.

Introduction

Learning management systems (LMS) have become integral tools in educational settings, facilitating the delivery of course materials, communication between instructors and students, and the administration of assessments. As LMS usage continues to grow, understanding its impact on student satisfaction and academic performance becomes crucial for educators and administrators. This study aims to explore how various aspects of LMS, including instructional quality, technology quality, course quality, and ease of use, influence student satisfaction. Additionally, the study seeks to investigate the relationship between student satisfaction with the LMS and their academic performance.

In recent years, research has increasingly focused on the effectiveness of LMS in enhancing student learning experiences. However, there is still a need to delve deeper into specific LMS constructs and their effects on student satisfaction. By examining factors such as instructional quality, technology quality, course quality, and ease of use, this study aims to provide valuable insights into how LMS can be optimized to better meet student needs and improve overall satisfaction.

Furthermore, understanding the link between student satisfaction with the LMS and academic performance can provide valuable insights for educators and institutions. By identifying factors that contribute to student satisfaction and their subsequent impact on academic outcomes, educators can tailor their approaches to LMS implementation and usage to enhance student engagement and success. This study sets out to contribute to the existing literature by providing empirical evidence on the influence of LMS constructs on student satisfaction and academic performance.

Literature review

Learning Management Systems (LMS) have become integral tools in educational settings, providing platforms for course delivery, content management, and student interaction. This literature review explores the influence of LMS constructs on student satisfaction and academic performance.

Instructional quality within the LMS refers to the effectiveness of educational content, materials, and delivery methods. Research indicates that high-quality instructional design positively impacts student satisfaction and academic performance (Alavi et al., 2016). Well-designed instructional materials, interactive features, and clear communication from instructors enhance student engagement and learning outcomes (Al-Fraihat et al., 2020).

Technology quality encompasses the reliability, functionality, and user-friendliness of the LMS platform. Studies have shown that technology quality significantly influences student satisfaction and academic performance (Kuo et al., 2014). A user-friendly interface, responsive technical support, and access to up-to-date technologies contribute to positive student experiences and improved learning outcomes (Aragonés-Manzanares et al., 2017).

Course quality refers to the design, organization, and relevance of the educational content and curriculum within the LMS. Research suggests that well-designed courses positively impact student satisfaction and academic performance (Ozkan & Koseler, 2009). Engaging course materials, clear learning objectives, and interactive activities promote active student engagement and deeper learning (Wang & Hsu, 2016).

Ease of use refers to the simplicity and intuitiveness of navigating the LMS platform. Studies have found that ease of use significantly influences student satisfaction and academic performance (Alenezi et al., 2010). Intuitive interfaces, clear navigation pathways, and minimal technical barriers enhance the overall user experience and contribute to positive learning outcomes (Cheng & Yuen, 2018).

Student satisfaction with the LMS has been linked to improved academic performance in various studies (Anshari et al., 2017). Satisfied students demonstrate higher levels of engagement, motivation, and learning outcomes (Chiu & Wang, 2008). Positive experiences with the LMS lead to increased student participation, retention, and achievement (Arbaugh, 2000).

Objective of the study

1: Assess the impact of learning management system (LMS) factors like instructional quality, technology quality, course quality, and ease of use on student satisfaction.

2: Investigate the relationship between student satisfaction with the LMS and academic performance.



Figure 1: Conceptual framework of the study

Methodology

This study employed a quantitative research approach to investigate the influence of learning management system (LMS) constructs on student satisfaction and academic performance. The methodology involved data collection, factor analysis, hypothesis testing using structural equation modelling (SEM), and interpretation of results. Data were collected from 312 students enrolled in various educational institutions within Chennai city. A structured questionnaire was administered to

gather responses regarding perceptions of LMS factors, student satisfaction, and academic performance. Factor analysis was conducted to identify and validate latent constructs related to instructional quality, technology quality, course quality, ease of use, student satisfaction, and academic performance. Structural equation modelling (SEM) was employed using the Maximum Likelihood method to test the proposed hypotheses.

The impact of learning management system (LMS) constructs on student satisfaction has been a subject of significant interest in educational research. This section provides a comprehensive review of relevant literature, examining instructional quality, technology quality, course quality, ease of use, student satisfaction, and their relationships with academic performance.

Instructional Quality of LMS and Student Satisfaction: Instructional quality within the LMS refers to the effectiveness of educational content, materials, and delivery methods. Previous studies have shown a strong positive relationship between instructional quality and student satisfaction (Alavi et al., 2016; Kim & Lee, 2018). High-quality instructional design, interactive learning materials, and clear communication from instructors contribute to increased student engagement and satisfaction with the LMS (Cavus & Ibrahim, 2009; López-Pérez et al., 2011).

Technology Quality of LMS and Student Satisfaction: Technology quality encompasses the reliability, functionality, and user-friendliness of the LMS platform. Research indicates that technology quality significantly influences student satisfaction (Kuo et al., 2014; Al-Fraihat et al., 2020). A robust and user-friendly LMS interface, responsive technical support, and access to up-to-date technologies enhance student perceptions of the system's quality and usability (Aragonés-Manzanares et al., 2017; Alqurashi, 2020).

Course Quality of LMS and Student Satisfaction: Course quality refers to the design, organization, and relevance of the educational content and curriculum within the LMS. Studies have consistently demonstrated a positive association between course quality and student satisfaction (Ozkan & Koseler, 2009; Wang & Hsu, 2016). Engaging course materials, well-structured learning activities, and alignment with student learning objectives contribute to higher levels of satisfaction with the LMS (Zimmerman et al., 2012; Fetzner, 2013).

Ease of Use of LMS and Student Satisfaction: Ease of use refers to the simplicity and intuitiveness of navigating the LMS platform. Research has highlighted the importance of ease of use in influencing student satisfaction (Alenezi et al., 2010; Nistor et al., 2013). Intuitive user interfaces, clear navigation pathways, and minimal technical barriers enhance the overall user experience and satisfaction with the LMS (Cheng & Yuen, 2018; Al-Samarraie et al., 2018).

Student Satisfaction and Academic Performance: Student satisfaction with the LMS has been linked to improved academic performance in several studies (Wang & Hsu, 2016; Anshari et al., 2017). Higher levels of satisfaction contribute to increased motivation, engagement, and learning outcomes among students (Chiu & Wang, 2008; Al-Fraihat et al., 2020). Satisfied students are more likely to actively participate in online learning activities, seek out additional resources, and achieve higher grades (Arbaugh, 2000; Yukselturk & Bulut, 2009).

Hypothesis:

H1: Instructional quality of LMS significantly influences student satisfaction.

H2: Technology quality of LMS significantly influences student satisfaction.

H3: Course quality of LMS significantly influences student satisfaction.

H4: Ease of use of LMS significantly influences student satisfaction.

H5: Student satisfaction significantly influences academic performance.

Result and Discussion

Table 1: Factor loadings and Cronbach's alpha values

Factor	Items	Loadings	Alpha
Instructional quality	Q1	.813	0.870
	Q2	.820	
	Q3	.834	
Technology quality	Q4	.827	0.829
	Q5	.833	
	Q6	.817	
Course quality	Q7	.811	0.801
	Q8	.785	
	Q9	.856	
Ease of use	Q10	.827	0.825
	Q11	.815	
	Q12	.782	
Student satisfaction	Q13	.851	0.788
	Q14	.848	
	Q15	.859	
Academic performance	Q16	.842	0.818
	Q17	.868	
	Q18	.858	

Source: Primary data

In Table 1, the factor loadings and Cronbach's alpha values are presented for each latent construct in the study. Factor loadings indicate the strength of the relationship between observed variables (items) and their underlying latent constructs. Higher factor loadings suggest a stronger association between the observed variables and the latent construct they represent. For instructional quality, items Q1, Q2, and Q3 exhibit high factor loadings of 0.813, 0.820, and 0.834, respectively, indicating a robust relationship with the instructional quality construct. The Cronbach's alpha value of 0.870 suggests excellent internal consistency reliability for this construct, indicating that the items measure the same underlying concept effectively.

Similarly, for technology quality, items Q4, Q5, and Q6 demonstrate strong factor loadings of 0.827, 0.833, and 0.817, respectively. The Cronbach's alpha value of 0.829 indicates high internal consistency reliability for technology quality. Course quality items Q7, Q8, and Q9 also exhibit notable factor loadings of 0.811, 0.785, and 0.856, respectively, with a Cronbach's alpha value of 0.801, indicating good reliability.

For ease of use, items Q10, Q11, and Q12 display factor loadings of 0.827, 0.815, and 0.782, respectively, indicating a strong association with the ease of use construct. The Cronbach's alpha value of 0.825 suggests high internal consistency reliability for this construct. Regarding student satisfaction, items Q13, Q14, and Q15 demonstrate substantial factor loadings of 0.851, 0.848, and 0.859, respectively, with a Cronbach's alpha value of 0.788, indicating good reliability.

Lastly, for academic performance, items Q16, Q17, and Q18 display strong factor loadings of 0.842, 0.868, and 0.858, respectively, with a Cronbach's alpha value of 0.818, suggesting good internal consistency reliability. Overall, the factor loadings and Cronbach's alpha values indicate the robustness and reliability of the measurement model, providing confidence in the validity of the constructs under investigation in the study.

Hypothesis testing using Structure equation modelling:

The current study applied SEM using Maximum Likelihood method. The results of the standardized regression analysis reveal insightful relationships within the context of the Learning Management System (LMS) and its impact on student outcomes were presented in table and figure 2. The criteria for selecting research hypothesis based on p value less than 0.05 and critical ratio (CR or T value) above 1.96. The standardized regression weight (β) indicates the strength of impact of particular independent variable on dependent variable.

Figure 2: Structure model of LMS

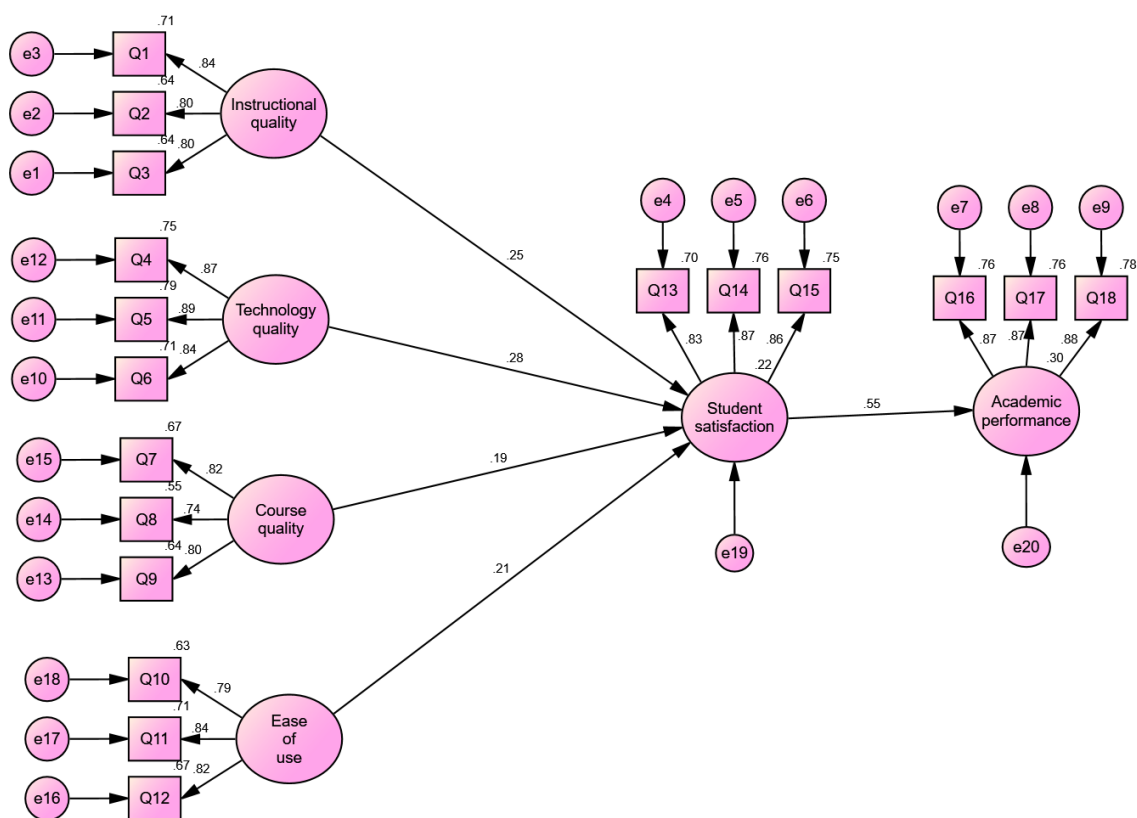


Table 2: Hypothesis testing

	Standardized regression weight	S.E.	C.R.	P	Result
Instructional quality → Student satisfaction	0.250	.067	4.136	0.000	Accepted
Technology quality → Student satisfaction	0.277	.058	4.690	0.000	Accepted
Course quality → Student satisfaction	0.193	.064	3.173	0.000	Accepted
Ease of use → Student satisfaction	0.207	.063	3.450	0.000	Accepted
Student satisfaction → Academic performance	0.551	.062	9.098	0.000	Accepted

Interpretation: Based on table 2 results, it is confirmed that, instructional quality emerges as a significant predictor of student satisfaction with $\beta = 0.250$, C.R. = 4.136, $p = 0.000$. Since $p < 0.05$, the hypothesis H1 was accepted and signifying that higher-quality instructional content correlates positively with elevated levels of student satisfaction. Similarly, the quality of technology within the LMS positively and significantly influencing student satisfaction. The $\beta = 0.277$, C.R. = 4.690, $p < 0.05$, confirm H2 acceptance. Additionally, course quality demonstrates a positive and significant impact on student satisfaction ($\beta = 0.193$, C.R. = 3.173, $p < 0.05$), emphasizing the importance of well-designed course content in shaping the students' satisfaction levels supporting H3 acceptance. Ease of use within the LMS emerges as another influential factor positively impacting student satisfaction ($\beta = 0.207$, C.R. = 3.450, $p < 0.05$). Therefore, H4 was supported. Further, the findings also highlighted the positive and significant influence of student satisfaction on academic performance. The β value for this path is 0.551, with C.R. = 9.098, $p < 0.001$). This emphasizes the pivotal role of a satisfied student base in fostering positive academic outcomes.

Discussion:

The findings of this study contribute valuable insights into the intricate relationship between various dimensions of the Learning Management System (LMS) and their impact on student outcomes. Each component, including instructional quality, technology features, course content, and ease of use, plays a pivotal role in influencing student satisfaction, ultimately contributing to academic performance.

The results of hypothesis testing provide strong evidence that instructional quality, technology quality, course quality, and ease of use within the LMS significantly influence student satisfaction, which in turn positively impacts academic performance. These findings underscore the importance of optimizing LMS constructs to enhance student satisfaction and foster positive academic outcomes.

Practical Implications for Educational Institutions: The findings of this study hold significant implications for educational practice and policy. By demonstrating the substantial influence of learning management system (LMS) constructs on student satisfaction and academic performance, the study underscores the importance of optimizing LMS design and functionality. Specifically, the results highlight the critical role of instructional quality, technology quality, course quality, and ease of use within the LMS in shaping student experiences and outcomes. These findings suggest that educational institutions should prioritize investments in LMS optimization, faculty training, curriculum design, and student support services to enhance the overall quality of online education. Moreover, the study emphasizes the need for ongoing assessment and improvement of LMS platforms to meet the evolving needs of students and educators in the digital learning environment. By leveraging these insights, educational stakeholders can work towards creating more engaging, effective, and inclusive online learning experiences, ultimately promoting positive academic outcomes for students across diverse educational settings..

Limitation and Future research:

While the findings are insightful, the study does have several limitations that should be considered for future research. Additional variables and possible moderating factors could be investigated in future studies. To further understand the dynamic interactions among LMS components, student happiness, and academic success, longitudinal studies could be conducted.

A good learning environment and academic performance are fostered by the combined effects of instructional, technological, and user-oriented components of learning management systems (LMSs), as this study elucidates.

Conclusion

This study has provided valuable insights into the influence of learning management system constructs on student satisfaction and academic performance. The results indicate that instructional quality, technology quality, course quality, and ease of use within the LMS significantly impact student satisfaction, which, in turn, positively influences academic performance. These findings highlight the importance of optimizing LMS design and functionality to meet the diverse needs of students in online learning environments.

Moving forward, educational institutions should prioritize investments in LMS optimization, faculty training, curriculum design, and student support services to enhance the overall quality of online education. By leveraging the findings of this study, educators and administrators can create more engaging and effective online learning experiences, ultimately fostering positive academic outcomes for students.

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