Research Article

Usability in learning management systems: A mixed-method analysis

Pembe Pelin Koca[1], Hakan Özcan[2*]

[1] Department of Computer Education and Instructional Technology, Graduate School of Natural and Applied Sciences, Amasya University, Amasya, Turkey

[2] Department of Computer Technology, Design Vocational School, Amasya University, Amasya, Turkey

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ABSTRACT

Usability analysis in software has a critical role in creating useful products for users and obtaining the necessary feedback. Learning Management Systems (LMSs) are among the most frequently used software in distance education. The usability of these systems is crucial for both student success and the quality of the service offered. This study examines LMS usability through faculty perceptions at a state university, employing a mixed-methods design. Quantitative data were collected using the System Usability Scale (SUS) from 109 faculty members, while qualitative insights were gathered from semi-structured interviews with nine participants. Statistical and thematic content analyses were employed to interpret and compare results. The quantitative analysis yielded an average SUS score of 63.85 ± 16, indicating moderate usability concerns. Based on findings from both the SUS responses and interview data, several recommendations were proposed, such as enhancing system infrastructure, simplifying the interface, improving instructional guidance, strengthening interaction features, optimizing file management, refining notification systems, addressing character encoding issues, and streamlining listing and reporting functions. The results underscore the importance of a user-centered development approach, incorporating participatory design principles. Future research should track how faculty adapt to LMS updates over time. We hope these findings will guide future usability studies.

1. Introduction

The rapid advancement of technology has transformed traditional educational paradigms, leading to the widespread adoption of distance education (DE). DE supports teaching and learning processes by offering lifelong learning opportunities to everyone without any spatial and temporal restrictions [1]. While inequality of opportunity or economic challenges that may arise in traditional education can be alleviated by DE, the number and variety of educational materials that can be used can be increased, and rich, flexible and interactive learning environments can be created [2]. These environments offer advantages including the stimulation of multiple senses, enabling users to see, hear, and interact with content, time efficiency, rapid access to information, and the ability to record lessons [3]. Furthermore, during epidemics such as COVID-19, when conventional education is interrupted, the necessity for DE implementations to ensure educational continuity increases. Pokhrel & Chhetri [4] emphasize the necessity for efficient, flexible educational programs and strong technological infrastructures for practical DE implementations. In this context, LMSs have become the most prevalent digital platforms [5].

LMSs are software applications that support both synchronous and asynchronous learning, enabling students to access educational content regardless of their location. They enhance the organization, presentation, and evaluation of educational materials by serving as a centralized platform for all users [6]. LMSs provide numerous technological and educational advantages. These systems enable communication between educators and students via features such as discussion forums, messaging platforms, and announcements [7]. These advantages facilitate collaborative learning and allow educators to engage with students effectively, addressing their educational needs promptly [8,9]. Moreover, LMSs can produce individualized reports to assess and monitor student progress in real time. This methodology, grounded in data, enables the creation of personalized learning environments and provides individualized feedback [10]. Despite such advantages, the successful integration of LMSs into DE depends on user experiences and system usability [11].

According to ISO 9241-11, usability refers to the degree to which a product enables users to achieve their goals accurately, with minimal effort, and in a satisfying way within a specific context [12]. Users tend to avoid products that are difficult to use, unsuitable, time-consuming, or overly complex [13]. In contrast, enhanced usability improves a system's acceptability and facilitates individual adaptation [14]. Hence, usability becomes a crucial element in achieving commercial success and enhancing user productivity [15]. User feedback plays a vital role in identifying unanticipated issues during product development [16]. However, usability studies focused on understanding user experiences are frequently neglected in the development of educational software, thereby constraining opportunities to obtain valuable feedback [17]. Consequently, evaluating usability through user experience becomes essential for improving satisfaction and developing successful products.

***Corresponding author:** Hakan Özcan
*E-mail address: hozcan@amasya.edu.tr, https://doi.org/10.56158/jpte.2025.120.4.01

LMSs that seamlessly integrate with technological advancements and offer flexibility, effectiveness, customizability, and high usability are generally preferred by users [18]. Alshammari et al. [19] found that users are more satisfied, engaged, and motivated when LMS platforms are easy to use. According to their findings, an intuitive system allows users to focus on content rather than mechanics, resulting in a more engaging LMS experience. Furthermore, Gunesekera et al. [20] emphasize the importance of usability in learner satisfaction, stating that usability issues can lead to lower user retention. An empirical study [21] also found that systems with higher usability are more acceptable and associated with higher user satisfaction. Similarly, Mtebe & Kissaka [22] report that usability issues in LMSs impede effective user engagement and have a direct impact on how frequently and effectively users interact with the system. Given these findings, monitoring user satisfaction and conducting studies to improve LMSs are directly related to service quality and overall learning effectiveness, making these systems more appealing to users.

Usability studies of LMS often display a limited scope, particularly concerning faculty perspectives. Palve & Palve [23] underscore this disparity by demonstrating a distinct divergence in faculty attitudes regarding the utilization of LMS for pedagogy and learning. Their findings indicate a deficiency in literature that explores the impact of LMS utilization on pedagogical practices from the faculty's viewpoint. Kock et al. [24] similarly observe that scant research examines usability issues from the viewpoint of academic personnel. They assert that contemporary research often overlooks the specific challenges faced by faculty members. Bousbahi & Al-Razgan [25] found that individual and organizational factors substantially affect faculty perceptions of LMS usability. They argue that numerous studies overlook these insights, which could enhance the comprehension of faculty experiences. A recent study [26] emphasizes the significance of incorporating faculty viewpoints in usability evaluations, noting that these experiences offer essential insights into usability challenges that remain underrepresented in the literature. As a result, evaluating LMS usability through faculty experiences is critical, as faculty are primarily responsible for content delivery and student engagement. For this reason, our study aims to identify key challenges, highlight areas for improvement, and support the ongoing development of user-friendly and efficient LMS adaptations based on faculty-perceived usability.

2. Material and method

This study assessed faculty perceptions of LMS usability at a state university in Turkey, with the objective of identifying current usability issues and recommending enhancements for the platform. A mixed-methods approach was utilized, integrating quantitative and qualitative analyses. During the quantitative phase, faculty perceptions were evaluated utilizing the System Usability Scale (SUS), initially created by Brooke [27] and subsequently adapted into Turkish as "SUS-TR" by Demirkol & Şeneler [28]. The qualitative phase investigated usability concerns and requested faculty recommendations for improving the LMS experience. Convenience sampling [29] was implemented with specific inclusion criteria. Faculty members who were easily accessible to the researchers comprised the participant population. The inclusion criteria consisted of a willingness to share insights and prior experience with the LMS (having instructed at least one course). This method facilitated direct engagement with the LMS, permitting participants to offer substantive feedback. It also enabled effective recruitment, engaging faculty from various departments throughout the study period (Fall 2023–2024 academic year). Quantitative data were gathered online from 109 faculty members, whereas qualitative data were acquired through semi-structured interviews with nine participants.

The study's primary research question was: "How is the usability of the LMS perceived by academic staff?" To answer this question, several sub-questions were developed, examining the overall perceived usability level, differences based on faculty members' gender and educational background, and specific usability issues along with faculty recommendations for improvement. Ethical approval was obtained from the university's Social Sciences Ethics Committee (dated 15.11.2023, numbered 161549).

To systematically conduct this study, several key steps were followed. First, the target population was reached using an integrated sampling approach. Next, survey data were analyzed, and SUS scores were calculated, while examining their relationship with demographic characteristics. Then, qualitative data were analyzed to identify usability challenges and faculty recommendations. Finally, all findings were interpreted, highlighting the usability level, demographic associations, key challenges, and suggested improvements. Figure 1 summarizes these steps.

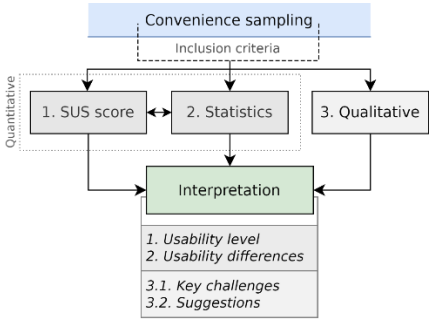

Fig. 1. Study methodology flow

System usability scale

The quantitative phase utilized the SUS-TR as mentioned before. This scale, as based on the SUS, is a 10-item, 5-point Likert-type scale with two factors: positive (items 1, 3, 5, 7, and 9) and negative (items 2, 4, 6, 8, and 10). The reliability and validity of the SUS-TR were confirmed by Demirkol & Şeneler [28], who reported Cronbach's Alpha reliability coefficients of 0.769 for the positive factor, 0.805 for the negative factor, and an overall reliability of 0.84. Each item displayed Cronbach's Alpha values above 0.7. The variance explained was 29.5% for the first factor and 27.3% for the second factor, indicating strong psychometric properties. In this study, all SUS scores were obtained using the SUS-TR scale and are reported as "SUS scores" for consistency. To calculate the SUS score, responses follow a three-step adjustment process [27]. First, since each item is rated on a 5-point Likert scale, the responses must be

modified: for odd-numbered questions, 1 is subtracted from each score, while for even-numbered questions, the score is subtracted from 5. Next, all adjusted values (*X*) are summed to generate a total score. Finally, this total is multiplied by 2.5 as shown by Eq. 1, ensuring the final SUS score falls within a 0 to 100 range. A SUS score below 50 indicates significant usability challenges, suggesting that major improvements are needed. Scores in the 70s and 80s reflect better usability, though they do not necessarily guarantee high acceptability in real-world applications. [30].

$$SUS\ score = (\sum_{i=1}^{10} X_i) * 2.5 \quad (1)$$

Semi-structured interview guide

The qualitative component aimed to identify factors influencing LMS usability from faculty perspectives and to explore their suggestions for improvements. Semi-structured interviews were conducted using a researcher-developed interview guide. Interviews were conducted by a protocol developed by the researchers, piloted, and reviewed by three experts to ensure validity and reliability. The interview guide focused on usability problems and potential solutions, aligning with the research objectives.

Data analysis

Quantitative data collected through Google Forms were analyzed using SPSS software. Qualitative data were gathered through telephone interviews and transcribed verbatim using Good Tape transcription software, with thematic coding performed using NVivo 14 software. This process enabled systematic identification and categorization of recurring themes and patterns within the qualitative data.

3. Results

This section presents the quantitative and qualitative findings on faculty members' perceptions of LMS usability. The quantitative analysis evaluates usability scores to determine the perceived usability level of the LMS and, based on these scores, examines potential differences by gender and educational background. Building on these findings, the qualitative analysis explores key usability issues and faculty recommendations for improvement to enhance the LMS experience.

3.1. Perceived usability level of the LMS

The SUS scores reflecting faculty perceptions of LMS usability were calculated by analyzing the collected scale data. The results of this analysis are presented in Table 1.

Table 1. System usability scale scores

Participant	Score	Participant	Score	Participant	Score
P1	70	P38	67.5	P74	55
P2	85	P39	77.5	P75	70
P3	67.5	P40	80	P76	85
P4	55	P41	30	P77	57.5
P5	77.5	P42	82.5	P78	37.5
P6	82.5	P43	70	P79	67.5
P7	77.5	P44	70	P80	85
P8	67.5	P45	67.5	P81	70
P9	70	P46	35	P82	75
P10	40	P47	50	P83	62.5
P11	60	P48	57.5	P84	27.5
P12	75	P49	57.5	P85	77.5
P13	50	P50	67.5	P86	87.5
P14	75	P51	35	P87	70
P15	62.5	P52	65	P88	80
P16	92.5	P53	27.5	P89	52.5
P17	80	P54	70	P90	40
P18	72.5	P55	70	P91	65
P19	15	P56	80	P92	82.5
P20	80	P57	62.5	P93	47.5
P21	75	P58	52.5	P94	47.5
P22	50	P59	62.5	P95	62.5
P23	80	P60	87.5	P96	65
P24	87.5	P61	67.5	P97	62.5
P25	75	P62	52.5	P98	67.5
P26	45	P63	57.5	P99	47.5
P27	90	P64	72.5	P100	82.5
P28	30	P65	55	P101	52.5
P29	77.5	P66	37.5	P102	65
P30	50	P67	70	P103	20
P31	72.5	P68	62.5	P104	67.5
P32	75	P69	72.5	P105	72.5
P33	35	P70	47.5	P106	75
P34	57.5	P71	47.5	P107	67.5
P35	97.5	P72	70	P108	65
P36	72.5	P73	52.5	P109	57.5
P37	72.5	Average SUS score: 63.85 ± 16.49			

The overall distribution and concentration of SUS scores are presented in Figure 2. It features a histogram with a kernel density estimate (KDE) curve. The KDE provides a smoothed representation of the frequency distribution, helping to highlight where responses are most concentrated. In this case, the curve shows a prominent peak around the mid-60s to low-70s, reinforcing the observation that a large portion of participants rated usability within this range. The top x-axis maps letter-based grades according to the curved grading scale [31], helping to contextualize score clusters. Only selected grades ('F', 'D', 'C−', 'C+', 'B+', and 'A+') are labeled to emphasize broader ranges. The curved scale reveals that the most common usability perception falls within the C range (65.0–71.0), positioned between 'C+' and 'C-'. A total of 26 participants scored in this band. When combining all scores from A+ to C, 64 participants scored 65.0 or above, suggesting that the system is generally perceived as usable. However, the results also point to areas where confidence and satisfaction could be further improved.

Additionally, Figure 3 complements the findings by showing the spread and variability of SUS scores using a boxplot. It highlights key statistical indicators such as the median, interquartile range, and potential outliers. A red dashed line marks SUS = 68.5, the benchmark often cited as the threshold for acceptable usability [31]. The boxplot indicates a moderate spread with a slight tendency toward lower-than-average usability. The mean, median, and mode are closely aligned, suggesting a relatively symmetric distribution. However, a notable portion of participants scored below 68.5, implying that while some users evaluated the system positively, overall usability may not yet meet standard expectations. To explore these concerns in more depth, we conducted follow-up interviews with participants. These interviews helped identify key issues and gather targeted recommendations for improvement.

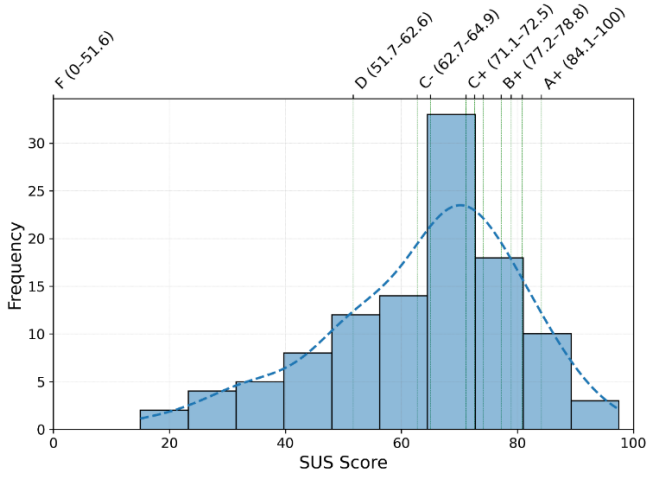

Fig. 2. Distribution of system usability scale scores with curved grading scale grades

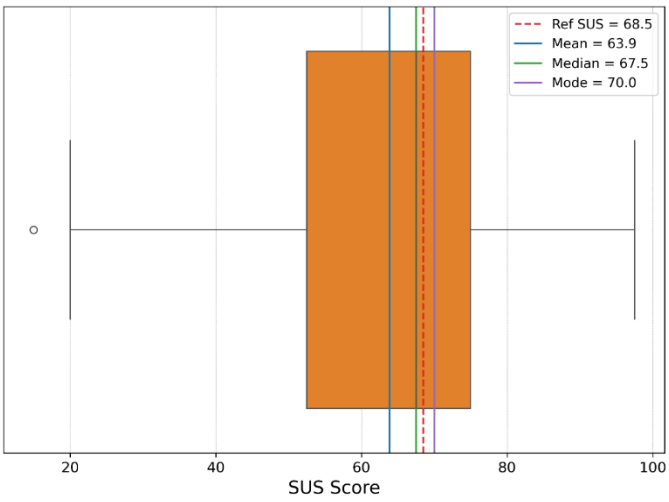

Fig. 3. Spread and variability of system usability scale scores

3.2. SUS scores vs. gender

To determine whether faculty members' SUS scores varied based on gender, a T-test was conducted. This analysis examined whether gender had a statistically significant effect on perceived LMS usability scores. As presented in Table 2, the results showed no significant difference between male and female faculty members, $t(107) = 0.254$, $p = .800$. The mean SUS score for female participants ($N = 45$) was 64.33 ($SD = 15.11$), while for male participants ($N = 64$) it was 63.52 ($SD = 17.51$). These findings suggest that gender does not have a meaningful impact on faculty members' perceived usability of the LMS.

Table 2. Comparison of participants' SUS averages by gender

Gender	N	Mean	SD	t	df	p
Female	45	64.3333	15.10757	.254	107	.800
Male	64	63.5156	17.50691			

3.3. SUS scores vs. educational background

To explore potential differences in faculty members' SUS scores according to their educational background, a T-test was conducted. The educational background of participants is assessed based on their educational degrees. The analysis examined whether educational degree had a statistically significant effect on perceived LMS usability scores. Two participants were omitted from the analysis due to incomplete responses. As shown in Table 3, the results revealed no significant difference between faculty members with a master's degree and those with a doctoral degree, $t(105) = 0.411$, $p = .682$. The mean SUS score for faculty with a master's degree ($N = 26$) was 65.10 ($SD = 16.96$), while the mean score for faculty with a doctoral degree ($N = 81$) was 63.55 ($SD = 16.62$). Since the p-value (0.682) is greater than 0.05, it can be concluded that educational background does not have a significant impact on faculty members' perceived usability of the LMS.

Table 3. Comparison of participants' SUS averages by educational background

Degree	N	Mean	SD	t	df	p
Master's	26	65.0962	16.96291	.411	105	.682
Doctoral	81	63.5494	16.61543			

3.4. Issues affecting the usability of the LMS as perceived by faculty members

To determine the issues affecting the perceived usability of the LMS by faculty members, they were asked the open-ended question, "What are the issues affecting the usability of the LMS?". Based on their responses, follow-up questions were asked to explore the topic in more depth. Through a content analysis of the interview data, eight main themes emerged: "Infrastructure" (8 participants), "Design features" (7 participants), "Guidance and hints" (5 participants), "File functions" (5 participants), "Interaction" (4 participants), "Listing" (4 participants), "Notifications" (3 participants), and "Character encoding" (3 participants). Table 4 presents the frequency of these themes based on participant responses.

According to faculty members, the most influential factor affecting LMS usability is infrastructure-related issues. It was reported that when more than ten users attempted to join a voice-based session simultaneously, the system experienced delays in response time. This issue was highlighted as a significant challenge, particularly for live lectures. Additionally, some faculty members reported experiencing lags while watching recorded lectures or difficulties with the fast-forwarding function in video recordings. Another commonly mentioned issue was access problems during exam periods due to internet connection failures. The second major issue concerns design features. Faculty members noted problems such as complexity in menus and interface, the absence of widely accepted color schemes, and inefficient use of screen space. One faculty member stated, "Normally, inactive buttons are gray, and active ones are bright. This fundamental design principle is not followed in the system". Another faculty member commented, "There are too many elements on the homepage, which creates a cognitive load for us". The third issue relates to the lack of guidance and hints within the system. A participant noted, "It takes time to understand what the buttons do. You need to know which button to click and when". Some noted that the system only allows a limited range of formats, such as PDF and MP4, which can hinder flexibility in content sharing. One faculty member stated that when uploading course materials for multiple weeks, they had to upload the same file separately for each week. Another participant mentioned the inability to export question banks in Word format, making content sharing more challenging. The fifth issue pertains to interaction. Faculty members indicated that the LMS lacks interactive learning materials and does not provide adequate communication tools for interaction between students and faculty. The sixth issue relates to listing and reporting functionalities. Some faculty members expressed difficulties in generating exam reports based on students and class performance. One participant noted, "I cannot see how much a student has scored across all assessments and exams in a single report". Another stated, "I struggle to generate class-based assignment results". The seventh issue concerns notifications and messaging. Faculty members reported that they do not receive confirmation when a message is delivered to students, and finding the most recent messages is difficult. One participant noted, "Message notifications do not appear. The most recent messages are not displayed at the top in the message menu". The eighth and final issue is character display problems. Some faculty members observed that Turkish characters were not correctly displayed in certain text input areas, especially in open-ended question fields.

Table 4. Issues in LMS usability based on faculty perceptions

Theme	Number of Participants	Frequency	Participants
Infrastructure	8	17	P1, P2 (2), P3 (2), P5 (4), P6, P7, P8 (5), P9
Design features	7	29	P1 (10), P2 (4), P3 (4), P4 (2), P6 (5), P7 (2), P9 (2)
Guidance and hints	5	18	P1 (8), P2, P4, P6 (6), P9 (2)
File functions	5	15	P1, P2 (4), P3 (5), P4, P9 (4)
Interaction	4	12	P1, P3 (7), P4 (3), P6
Listing	4	6	P1, P2, P3 (2), P6 (2)
Notifications	3	7	P1, P3 (3), P6 (3)
Character encoding	3	3	P2, P6, P8

Note: As multiple themes were reported by each participant, the frequency values are higher than the number of respondents. When considering the most frequently mentioned issues, design features (f = 29) had the highest occurrence, followed by guidance and hints (f = 18), infrastructure (f = 17), file functions (f = 15), interaction (f = 12), notifications (f = 7), listing (f = 6), and character encoding (f = 3). In the participant lists, parentheses indicate how often a participant reported the theme (e.g., P2(2)); no number means it was reported once.

3.5. Faculty members' recommendations for improving LMS usability

During interviews with faculty members, in addition to identifying usability issues, they were also asked for potential solutions. A content analysis of their responses revealed eight key themes: "General system structure" (8 participants), "Guidance and hints" (6), "Design features" (6), "Infrastructure" (3), "Interaction" (3), "File functions" (2), "Character support" (2), and "Navigation mechanism" (1). Table 5 presents the frequency of these themes.

The most frequent recommendation was to improve the overall system structure. Faculty recommended conducting pilot usability studies, redesigning the LMS in accordance with user needs, and iterating prototypes based on user feedback. One participant emphasized the importance of "participatory design" and recommended greater direct engagement with users. Another proposed incorporating learning analytics to help students and instructors track performance. In addition, gamification elements and reminder notifications for deadlines were suggested to boost motivation. Another major area of improvement was guidance and hints. Faculty recommended adding tooltips and explanatory texts near buttons to clarify their functions. In this regard, one participant stated, “A tooltip icon could appear when hovering over a button”. Some recommended integrating user guidance videos into the platform. Design improvements were also a priority. Participants suggested grouping menu items by user roles and adding a search function. One faculty member proposed, “Frequently used menus for students and instructors could be grouped. Steps for tasks like course creation, announcements, and assignment submissions should be simplified”. Additionally, another suggested, “Frequently used elements should be highlighted, while less-used ones should be minimized”. Infrastructure-related recommendations included optimizing content for various bandwidths and allowing users to adjust audio and video quality to match their internet connection. Besides that, faculty recommended incorporating social network features and an AI-powered dashboard to highlight upcoming live lectures and events. They suggested a bulk-download option for course materials and stressed the importance of establishing appropriate file size and format limits for file functions. Faculty also recommended improving text input fields to enhance character support, particularly in open-ended responses. Finally, an AI-powered navigation tool was proposed to assist users in locating personalized content and teachers in more effectively suggesting resources to students.

Table 5. Recommendations for improving LMS usability based on faculty perceptions

Theme	Number of Participants	Frequency	Participants
General system structure	8	13	P1 (2), P2, P3 (2), P4 (2), P5, P6 (2), P7 (2), P9
Guidance and hints	6	11	P1 (3), P2, P4, P5 (2), P6 (3), P8
Design features	6	9	P2, P3 (2), P4 (2), P5, P6, P7 (2)
Infrastructure	3	3	P6, P7, P8
Interaction	3	3	P4, P5, P6
File functions	2	2	P1, P3
Character support	2	2	P6, P8
Navigation mechanism	1	1	P2

Note: As participants provided multiple recommendations, frequency values exceed the number of respondents. The most frequently mentioned recommendations focused on general system improvements (f=13), followed by guidance and hints (f=11), design features (f=9), infrastructure (f=3), interaction (f=3), file functions (f=2), character support (f=2), and navigation mechanism (f=1). In the participant lists, parentheses indicate how often a participant reported the theme (e.g., P1(2)); no number means it was reported once.

4. Discussion

This study explored faculty members’ perceptions of LMS usability in DE, aiming to identify usability challenges and suggest improvements. The quantitative findings, derived from SUS scores, revealed moderate usability concerns and highlighted various factors that may affect the overall user experience of the LMS. The qualitative results highlighted key usability issues related to infrastructure, design, guidance, file management, interaction, reporting, notifications, and character encoding. It was found that infrastructure should be optimized for efficiency, and that information and notification flows should be improved to facilitate transactions, messaging, and overall system use. Additionally, Turkish character compatibility should be enhanced in text-based interactions. Faculty members also suggested that AI-powered modules could be integrated for content organization and support. Other expectations included the ability to list content based on specific criteria, the development of interactive course materials, and enhanced communication and interaction between students and instructors. Furthermore, faculty members emphasized the need to expand supported file types and integrate instructional materials, such as guidelines and videos, to assist users in navigating the system. These findings highlight the necessity of usability-focused enhancements to create a more effective and user-friendly LMS experience.

This study’s findings align with previous research on LMS usability challenges, particularly regarding infrastructure limitations, design inefficiencies, lack of guidance, interaction deficiencies, and system responsiveness issues. Compared to prior studies, our research highlights the faculty perspective on usability concerns and proposes targeted improvements, while also examining the effects of gender and educational background on usability perception. Several studies have documented similar challenges, particularly concerning infrastructure-related issues. For instance, Alturki et al. [32] reported system slowdowns and bandwidth limitations, which hindered faculty accessibility at King Saud University. Similarly, Binyamin et al. [33] identified moderate usability concerns at Jeddah Community College, where the SUS score was 69.3, indicating room for improvement. More critically, Kurata [34] found that LMS usability significantly affected user satisfaction, with an SUS score of 51.75, suggesting major design flaws that impacted the learning experience.

Beyond infrastructure, design-related issues also play a crucial role in LMS usability. Medina-Flores & Morales-Gamboa [35] identified problems such as complex menus, unclear navigation, and inconsistent visual hierarchy, emphasizing the need for

heuristic-based design improvements. Similarly, Ateş & Güyer [36] found that faculty often struggled with LMS navigation during initial use, leading to a steep learning curve. Additionally, Özonur et al. [37] found that while an LMS received above-average usability ratings, interface navigation and support services remained problematic, reinforcing the need for further enhancements. These findings align with our results, underscore the need for simplified interfaces and personalized support to improve usability.

Our study found no significant differences in SUS scores based on gender or educational background, suggesting that factors such as system familiarity may have a more substantial influence on usability perception than demographic characteristics. However, the literature on this topic remains inconsistent, making direct comparisons difficult. For instance, Turan & Canal [38] reported that women rated design and ease of use more positively, while Alturki et al. [32] found that men assigned higher usability scores to their LMS. These discrepancies may stem from differences in LMS infrastructure, user experience, and contextual factors, underscoring the need for further research into gender-based variations in usability perception.

To address these usability concerns, several studies emphasize the role of usability testing and participatory design. Medina-Flores & Morales-Gamboa [35] and Turan & Canal [38] both stressed the importance of continuous system refinement based on user feedback. This aligns with our findings, reinforcing the need for pilot usability studies for each prototype. Tanışık [39] further highlighted that usability issues in university web platforms often stem from poor navigation, accessibility barriers, and cognitive overload, which reinforces the importance of intuitive and user-centered design principles in LMS development. Similarly, Alturki et al. [32] emphasized the need for customized LMS interfaces to enhance accessibility, aligning with our findings that adaptive menus, improved guidance tools, and more intuitive workflows are essential.

These results suggest that enhancing LMS usability will not only improve the user experience but also directly reinforce faculty adoption of the system, as previously highlighted by Lavidas et al. [40]. Overall, this study underscores the necessity of systematic usability enhancements in LMS platforms. Key areas for improvement include simplifying the interface, providing clearer guidance, enhancing student-instructor interaction, and optimizing system performance for varying network conditions. Additionally, the impact of demographic factors on usability perception may differ across systems, as research suggests that age, gender, and experience play a role in shaping product usability [41,42]. Moreover, user preferences significantly influence LMS effectiveness [43], reinforcing the need for user-centered design strategies.

5. Recommendations

Future studies should adopt a longitudinal design to monitor how faculty adapt to LMS updates, as both the system and user experiences may evolve over time. To validate and extend the findings, future research should also incorporate student participants. As for LMS development, the recommendations include: (1) simplifying the interface for easier navigation and accessibility; (2) using adaptive guidance (e.g., tooltips and instructional videos); (3) improving interaction tools to boost engagement; (4) allowing broader range of file formats and bulk actions; (5) Enhancing system stability to avoid lags, especially during live sessions, and optimize mobile compatibility across various network conditions; (6) providing personalized content (e.g., AI-driven dashboards); (7) implementing learning analytics to track student progress.

6. Conclusion

This study offers insights into faculty perceptions of LMS usability and highlights the need to improve the system to meet technological and pedagogical expectations. The findings stress the value of a user-centered approach and participatory design for effective LMS integration in education. Addressing these challenges can help LMSs better support faculty in delivering engaging and efficient experiences. We hope these insights will guide future research on system design and usability.

7. Limitations

This study is limited to faculty perceptions of LMS usability within a specific institutional context and is based on the version available at the time of research. Since then, the LMS has received updates, potentially impacting usability perceptions. Additionally, while both quantitative and qualitative methods were used, the findings rely on self-reported data and the instruments used. Further studies are needed, particularly by incorporating student participants, to expand the population and conduct longitudinal assessments to track usability changes.

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Authorship Contributions

P. P. Koca contributed to the conception and design of the study, collected and processed the data, conducted the analysis, reviewed the literature, and drafted the manuscript.

H. Özcan contributed to the conception and design of the study, supervised the research, participated in the analysis, co-wrote the manuscript, and contributed to its revision.

Declaration of conflicting interests

The authors declare no competing interests.

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Ethics

This study was approved by the Amasya University Social Sciences Ethics Committee, approval number 161549, dated November 15, 2023.

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