Journal of Education and Learning (EduLearn)
Vol. 19, No. 3, August 2025, pp. 1662~1669
ISSN: 2089-9823 DOI: 10.11591/edulearn.v19i3.22350

Needs and challenges of academics and students in using a learning management system: a user experience approach

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Article Info

Article history:

Received May 25, 2024
Revised Aug 6, 2024
Accepted Aug 28, 2024

Keywords:

Learning management system
Moodle
User experience
User experience questionnaire
UX honeycomb framework

ABSTRACT

This study explores the user experience (UX) of academics and students in using a Moodle-based learning management system (LMS) and provides opportunities for improvement. The study employs a qualitative approach to gain a deep understanding of user perspectives, combining focus group discussions (FGDs) with the user experience questionnaire (UEQ). The analysis revealed six themes: usability, communication, course builder, monitoring and assessment, content management, and technical support. These themes identify areas where the Moodle-based LMS can be enhanced to improve the overall UX. The results of this study can guide the development of more user-friendly LMS platforms and inform best practices for UX design in educational technology.

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1. INTRODUCTION

The rapid advancement of technology has revolutionized modern society, offering diverse facilities and opportunities [1]. Among these advancements, the learning management system (LMS) stands out as a powerful tool for educational institutions, enabling efficient course delivery and management through integrated e-learning services [2]–[4]. An LMS consolidates administrative tasks, progress monitoring, reporting, assessment, and course creation into a single platform [5]. One of the prominent LMS that is being increasingly used is the Moodle or modular object-oriented dynamic learning environment [6], [7]. Despite its potential, widespread adoption of LMS within higher education remains limited [8]–[11]. Previous research has identified complexity as a significant barrier to LMS adoption [5], [12]. This indicates that the quality of LMS in facilitating teaching and learning processes is significantly affected by usability and user experience (UX) [13]–[15]. While usability studies have focused on objective aspects such as the system's reliability, usefulness, and efficiency, UX includes both objective and subjective aspects [16]. UX is a holistic concept [17], it includes users 'attitudes, emotions, and psychological responses [18], [19], and it encompasses all interactions between users and the product, as well as the company providing it [20]. The importance of UX extends beyond mere usability that influences software adoption and user performance [13], [18], [21], [22]. A higher perceived quality of UX is associated with increased usage of technology [18], [23]. Understanding UXs to identify and address difficulties in an LMS provides feasible solutions to

improve the platform [14]. The UX Honeycomb framework by Peter Morville outlines six principles that UX designers must address to create a product that meets user needs. These are useful, usable, desirable, findable, accessible, and credible [24]. These principles were explained in the results section.

The Moodle-based LMS of the Mindanao State University-Iligan Institute of Technology (MSU-IIT) is currently designed using a proprietary theme designed for Moodle. However, a significant challenge has been identified-the lack of UX research conducted prior to selecting and implementing the theme results in a complex interface design within the platform. This complexity leads to low adoption and engagement among most academics and students, which results in a poor UX. There are two main approaches to studying UX: quantitative and qualitative [16]. Quantitative methods help identify patterns and trends in user behavior and perceptions. In contrast, qualitative methods in UX research offer a deeper understanding of UXs. It explores the underlying motivations, emotions, and contexts that influence interactions with a product, shedding light on aspects that quantitative analysis may overlook [25]. This study employs a qualitative approach through focus group discussion (FGD) supplemented with user experience questionnaire (UEQ). It aims to examine the perspectives of academics (teachers) and students in utilizing the LMS, understand their needs, and identify potential solutions by aligning with the UX honeycomb principles.

2. METHOD

Using a purposive sampling technique, academics were chosen based on their utilization and development of Moodle classrooms, and students were selected based on their enrollment in multiple Moodle classrooms and their status as 4th-year students. A total of 6 academics and 6 students were selected to participate in the FGD, constituting two separate discussions for each. The selection process adhered to guidelines provided by the Nielsen Norman Group, which suggests that conducting qualitative usability tests with as few as 5 individuals can reveal nearly as many usability issues as testing with a larger sample size. Hence, with 12 participants in total, the study considered the sample size adequate for its objectives. Additionally, participants were selected based on their willingness to actively contribute to the discussions and provide insights into their experiences and suggestions for improvement within the Moodle platform.

The FGD, as shown in Table 1, consisted of 2 sessions and lasted approximately 60 minutes. A structured guide questionnaire was employed. The first session involved interviews and experience sampling regarding academics and students who have prior experience in interacting with the Moodle platform. Here, they could openly share their thoughts, experiences, and frustrations with the platform. The second session involved academics and students navigating and interacting with a Moodle classroom. The modules within this classroom consisted primarily of text-based content, supplemented with mixed-media elements such as images, videos, and knowledge checks. To capture clear descriptions of participants' learning processes, a think-aloud method was utilized as they engaged in the classroom. In the last session, UEQ was answered by participants to collect quantitative data.

Table 1. FGD-UX evaluation in this study

Session	Method	Outcome
1	Interview segment to collect UXs in Moodle	Identifying needs and challenges with the current Moodle interface and determining the necessary improvements.
2	Interactive session in a Moodle classroom: think-aloud method UEQ	

3. RESULTS AND DISCUSSION

The demographic information presented in Table 2 shows the composition of academics. Four academics have indicated that they are quite knowledgeable about Moodle and have used it extensively for teaching, while two of them have indicated that they are moderately familiar with Moodle and have used it for specific tasks or assignments. On the other hand, Table 3 shows the demographic information for students, all at the fourth-year level. These students have been actively utilizing Moodle for four years, with each enrolled in approximately 24 to 27 Moodle classrooms.

3.1. Qualitative analysis

The analysis of FGD data identified several themes that emerged in the experiences of academics and students regarding their interaction with the existing Moodle-based LMS. In the subsequent sections, there are representative quotes that exemplifies each theme across different study formats (academics and students). The analysis revealed six themes as shown in Table 4: i) usability, ii) communication, iii) course builder, iv) monitoring and assessment, v) content management, and vi) technical support. Consequently,

these themes are recognized as areas requiring improvement within the Moodle-based LMS, providing opportunities to enhance the platform in accordance with the UX honeycomb principles.

Table 2. Frequency demographics of academics

Characteristics	Descriptive results
Gender	Male=2; Female=4
Average age	32.17 (from 26 to 44) years old
Teaching experience	7.17 (from 2.5 to 14) years
LMS utilization	5.08 (from 2.5 to 10) years
Classrooms developed	13.17 (from 6 to 23) classrooms
Training attendance	2.33 (from 1 to 4) training sessions

Table 3. Frequency demographics of students

Characteristics	Descriptive results
Gender	Male=5; Female=1
Average age	22.5 (from 22 to 23) years old
Year level	4th year
LMS utilization	4 years
Classrooms enrolled	26.5 (from 24 to 27) classrooms

Table 4. Mindanao State University-Iligan Institute of Technology Moodle-based LMS

Themes	Honeycomb	Statement	Outline
Usability	Usable	The LMS is easy to learn and perform.	Easy to learn [26], [27]
	Findable	The LMS' content is easy to locate, has effective search functions, well-organized categories, and intuitive navigation.	Easy to locate [26], [27]
Communication	Useful	The LMS incorporates chat functionality for real-time collaboration.	Specific users' wants or needs [26]
Course builder	Usable	The LMS has a user-friendly interface for course creation.	
Monitoring and assessment	Useful	The LMS' feedback and monitoring is utilized to provide feedback and track learner progress.	
Content management	Useful	The course helps learners understand the material.	Modes of design and delivery [27]
	Desirable	The course incorporates engaging and interactive elements.	
	Accessible	The course includes materials that are designed to be inclusive.	Emotional engagement [26], [28]
	Findable	The course design facilitates quick access to both content and activities within the course.	Accessible to users with disabilities [26], [28]
Technical support	Accessible	Technical support is accessible to all users, providing assistive technology.	
	Credible	Technical support builds trust with users.	Trustworthy [27], [28]

3.1.1. Usability (usable and findable)

Students have highlighted challenges in navigating the platform, particularly in locating classrooms, due to inconsistencies in course name formatting, leading to confusion and inefficiency. Additionally, both academics and students have raised concerns about the current interface design used in the platform, particularly regarding small fonts and labeling. They noted issues where the general overview in a course keeps reappearing on top even after clicking a specific topic or module within the course, requiring constant scrolling.

Student : "Format of the classroom name… so that it is easier to search."
Student : "...I find the texts too thin. I get a headache reading the texts…"
Academic : "I find myself constantly scrolling down, and the general overview keeps reappearing at the top whenever I click on a module/topic..."

In the UX honeycomb principles, meeting user needs requires a system to be usable and findable. The usability and findability of the LMS are aspects that need attention. Improving navigation can be achieved by standardizing course name formats, simplifying the layout, and reducing unnecessary steps, which can help users access the information they need more quickly and fully utilize the platform.

3.1.2. Technical support (accessible and credible)

Academics have noted some outdated technical support documents, which are essential for guiding them in classroom development. Orientation/help are essential for every LMS. These resources serve to guide users and enhance their understanding of the learning platform, and troubleshoot any issues they may encounter [29]. Accessible and credible technical support documents and dedicated personnel increase users ' confidence in the platform, knowing that reliable assistance is readily accessible when needed.

Academic : "...Some of the documents in the help site are outdated..."

Both academics and students have also reported issues concerning system reliability during power interruptions. These problems have led to disruptions in their academic activities. Automatic saving feature is essential to ensure that work is not lost during unexpected interruptions.

Student : "There was one time when there was a power interruption and all the deliverables were lost."
Academic : "When checking assignments or activities on the web, if the connection is lost, comments and progress may disappear, and the content is not automatically saved on both the phone and web."

3.1.3. Content management (useful, desirable, accessible, findable)

Academics emphasize the importance of breaking down modules into smaller, manageable segments to enhance content comprehension and maintain student motivation. This sentiment is echoed by students, who express a preference for shorter readings and videos. Integrating interactive elements further supports their ability to focus on key concepts and engage actively in learning activities. The use of headers and visuals is also highlighted as important for efficiently locating specific content within the course. Additionally, students have noted the importance of generating transcripts for multimedia content to ensure accessibility and improve comprehension for all learners.

Student : "What would motivate me is simplicity… It only involved reading one article and then engaging in various activities to reflect on what I understood.."
Academic : "The excessive text and lack of selective information make it distracting…"
Academic : "I would appreciate more entertaining graphics to alleviate the pressure and engage me…"
Student : "Generating transcripts would be really helpful…"

3.1.4. Course builder (usable)

Academics have expressed concerns about creating a classroom in the Moodle-based LMS, noting that it requires a significant amount of time and effort. They also find it frustrating to navigate numerous available functions, which makes it difficult to efficiently organize and set up their classrooms. These issues often lead to overlooking important information and functions within the platform. As a result, they often only utilize the platform for basic functionalities which might affect student engagement. When a teacher demonstrates strong knowledge in using LMS [30], students generally report higher satisfaction levels and a more favorable learning experience [31]. Thus, simplifying the platform's functionalities to make it intuitive and assigning a dedicated staff to guide on classroom development and assess content quality could potentially improve both teacher efficiency and student outcomes.

Academic : "Due to the multitude of functions or options in the LMS, it can be confusing or overwhelming to create or structure a classroom."
Academic : "It would be nice to have a drag and drop feature for developing or structuring the classroom. There's a lot of clicking to add activities…"

3.1.5. Communication (useful)

Communication features, such as chat and video conferencing, remain underutilized in the platform due to its unattractive interface and small icons or buttons. Currently, the chat feature is typically located on the menu bar, but it has a less intuitive and appealing design, which causes inconvenience for users. Moreover, students have emphasized the importance of teacher presence within the online classroom to provide guidance and support. They have highlighted the significance of synchronous sessions, rather than solely relying on platforms like YouTube. This observation aligns with other studies indicating that real-time discussions and the chat feature are important for students in Moodle [14]. Enhancing the interface to facilitate real-time interaction among users within the platform is necessary.

Student : "Implement Group Chat instead of creating group chats from other platforms…"
Academic : "...the chat feature is usually located on the menu bar and dashboard, which can be inconvenient."
Student : "Incorporate opportunities for teacher-student interaction within the classroom to prevent reliance solely on platforms like YouTube…"

3.1.6. Monitoring and assessment (useful)

Two out of four academics have only used the grading tool. They expressed a desire to utilize the tool; however, due to time constraints, difficulties in learning it, and usability issues, they resorted to the traditional way of recording grades. This reliance on manual calculations and record-keeping is prone to human error and complicates students 'ability to monitor their progress. Additionally, the lack of timely feedback from teachers can negatively impact student motivation and engagement with the course [32]. This component is crucial for both students and teachers in online settings, as it allows for the monitoring and assessment of individual performance and validates the learning experience [33]. It is essential that such features are not overlooked and that adequate training and support are provided to academics to ensure they can fully utilize the platform.

Academic : "I mainly use the Gradebook for grade consultation… so that students can immediately see their grades using the Gradebook feature."

3.2. User experience questionnaire (UEQ) analysis

Alongside the FGD, a standardized questionnaire or UEQ was used to gather quantitative data on users 'experiences. The Moodle-based LMS is assessed across six dimensions: stimulation, perspicuity, efficiency, dependability, attraction, and novelty. The Cronbach's Alpha data measures the consistency of scale items [34]. A low alpha value for a scale suggests potential misunderstandings or varied interpretations of certain items by participants. Conversely, a high alpha coefficient (≥0.7) indicates strong consistency among scale items, minimizing the likelihood of misinterpretation. Based on the results as shown in Table 5, the aspects of attractiveness, efficiency, and dependability exhibit high consistency, while perspicuity, stimulation, and novelty show slightly lower but still acceptable levels of consistency. Therefore, the results across various aspects are reliable.

Table 5. Reliability results

Aspect	Cronbach Alpha value	Information
Attractiveness	0.87	Reliable
Perspicuity	0.75	Reliable
Efficiency	0.78	Reliable
Dependability	0.88	Reliable
Stimulation	0.73	Reliable
Novelty	0.79	Reliable

Figure 1 indicates that among the six assessment aspects, efficiency, dependability, and stimulation are rated above average, while attractiveness, perspicuity, and novelty are rated below average. This suggests that users perceive the platform as efficient in task completion, reliable in its performance, and stimulating in its interaction. However, attractiveness, perspicuity, and novelty are rated below average. This indicates that users find the platform less visually appealing, less intuitive or easy to understand, and lacking in innovative features. However, it is worth noting that there is still room for improvement across all six aspects, as the highest rating should ideally be excellent or good.

In this UEQ analysis, several factors influence the attractiveness of the platform. The current theme may fail to capture the attention of users, as it lacks visual features that enhance the platform's aesthetic appeal. Concerning perspicuity, users may find it challenging to become familiar with the platform and to learn how to use it effectively. This could indicate issues with its user interface (UI) and navigation. Additionally, in terms of novelty, the platform might be perceived as conventional, potentially hindering it is ability to attract and retain users. These findings validate the results from the thematic analysis of the FGDs, making it evident that the university's Moodle-based LMS requires improvement.

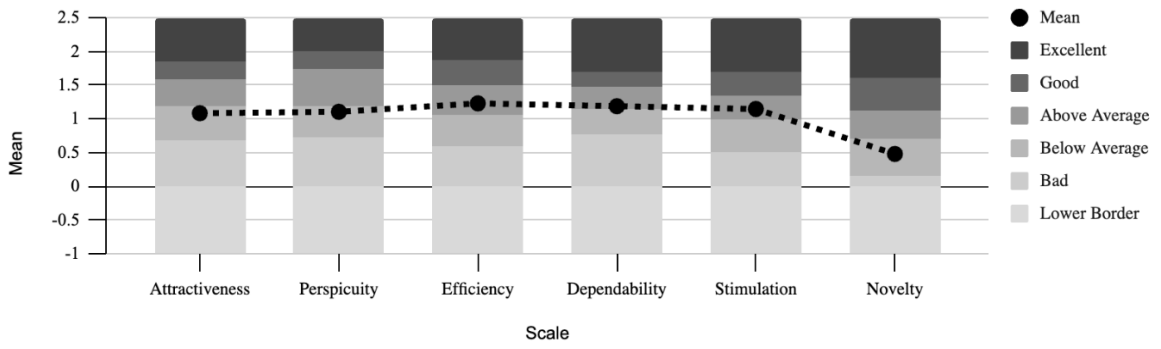

Figure 1. Benchmark UEQ

4. CONCLUSION

This study adopted a qualitative approach using focus group discussion, supplemented with quantitative data using UEQ to explore the perceptions of university academics and students regarding the Moodle-based LMS platform. By applying Peter Morville's UX Honeycomb principles, this study theoretically contributes to the broader understanding of LMS UXs. This study also provides insights that can guide future developments in online education by examining UX from a holistic perspective. It explores not only the UX of the LMS itself but also the broader context, considering other contributing factors. These factors include course administration/teacher usage, support/technical personnel, IT infrastructure, organizational policies, and other potential factors that affect the UX of LMS in educational institutions. This broader view aligns with Nielsen and Norman's definition of UX, which includes all interactions between users and the product, along with the company behind it. Moreover, UX is shaped by the interplay among three components: the user, the system, and the context. This study highlights how different factors interact to influence the overall UX of Moodle-based platforms. This understanding helps identify specific areas for improvement and provides actionable recommendations for enhancing the design and implementation of Moodle-based LMS in higher education. Areas for improvement in the university's Moodle-based LMS include the UI of the platform, the establishment of policies for classroom development and content quality, and the effective utilization of underused features such as communication and grading tools. Future pursuit of this study includes outlining specific design principles and guidelines that prioritize usability, efficiency, reliability and inclusivity within the university's Moodle-based LMS. This guideline will be used by designers and developers to enhance and integrate identified needs and challenges from academics and students obtained from this study.

ACKNOWLEDGEMENTS

We would like to express our appreciation to the participants for their support and cooperation of this study. We also acknowledge the support provided by Mindanao State University-Iligan Institute of Technology, which made this research possible through an internally-funded research grant with Mindanao State University-Iligan Institute of Technology Special Order No. 00295-2024.

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