International Journal of Social Learning
April 2025, Vol. 5 (2), 322-336
e-ISSN 2774-4426 and p-ISSN 2774-8359
DOI: https://doi.org/10.47134/ijsl.v5i2.360

An Exploration of University Students' Experience Using UI-UX Based E-learning Platforms: Challenges and Recommendations

Mujiono[1], Tangguh Okta Wibowo[2*], Silvanus Alvin[3]

[1,2,3]*Universitas Multimedia Nusantara, Jakarta, Indonesia*

*e-mail: tangguh.okta@umn.ac.id

ABSTRACT

This study explores the optimization of User Interface (UI) and User Experience (UX) in e-learning platforms to enhance user engagement and satisfaction. Using a qualitative case study approach, observations and interviews were conducted to identify user challenges. The findings reveal that an intuitive UI and positive UX significantly improve the efficiency of online learning. However, issues such as server reliability and accessibility barriers for students with disabilities remain challenges. This study highlights the need for inclusive and responsive UI/UX design to foster an effective online learning ecosystem. Recommendations are provided for platform developers to address these shortcomings, ensuring a more accessible and seamless experience for students, educators, and administrators, particularly in higher education. The results serve as a foundation for further improvements in e-learning platform design and implementation.

***Keywords*:**

Ui Ux; Platform e-learning; Flexibility; Accessibility; University.

ABSTRAK

Penelitian ini mengeksplorasi optimalisasi User Interface (UI) dan User Experience (UX) dalam platform e-learning untuk meningkatkan keterlibatan dan kepuasan pengguna. Dengan menggunakan pendekatan studi kasus kualitatif, observasi dan wawancara dilakukan untuk mengidentifikasi tantangan yang dihadapi pengguna. Hasil penelitian menunjukkan bahwa UI yang intuitif dan UX yang positif secara signifikan meningkatkan efisiensi proses pembelajaran daring. Namun, masih terdapat kendala seperti keandalan server dan hambatan aksesibilitas bagi mahasiswa penyandang disabilitas. Penelitian ini menekankan pentingnya desain UI/UX yang inklusif

Submitted: 2024-10-14; Accepted: 2025-04-09; Published: 2025-04-28
***Corresponding author:** tangguh.okta@umn.ac.id

dan responsif guna menciptakan ekosistem pembelajaran daring yang efektif. Rekomendasi diberikan kepada pengembang platform untuk mengatasi kekurangan tersebut agar pengalaman pengguna menjadi lebih mudah diakses dan lancar bagi mahasiswa, pendidik, dan administrator, khususnya di pendidikan tinggi. Hasil penelitian ini diharapkan menjadi dasar bagi perbaikan lebih lanjut dalam desain dan implementasi platform e-learning.

***Kata kunci*:**

Ui Ux; Platform Pembelajaran Daring; Fleksibilitas; Aksesibilitas; Universitas.

1. Introduction

Online education has emerged as a crucial component of contemporary learning, particularly with the advancement of information and communication technology (ICT). Online learning platforms, as a vital aspect of this educational shift, have significantly enhanced access to knowledge and learning, free from geographical and temporal limitations. However, the effectiveness of online learning is influenced not only by the availability of educational content but also by an optimal user interface (UI) and user experience (UX).

Previous research has highlighted that the disparity between effective interface design and a satisfying user experience can significantly impede the success of online learning. Users frequently encounter challenges such as complex navigation, confusion in utilizing features, inadequate platform responsiveness, and a lack of user engagement. These issues have resulted in low satisfaction levels, potentially diminishing interest and participation in online learning. Over the past decade, technological advancements have fostered the widespread adoption of online learning platforms, creating an urgent need to enhance both User Interface (UI) and User Experience (UX).

Recent research shows that optimizing UI and UX not only enhances the effectiveness of online learning platforms but also increases user engagement, making them an integral component of successful platform development (Law et al., 2009). The visual component of a platform, known as UI, is vital for ensuring effective user interaction with the system. An effective UI design should focus on intuitive layouts, straightforward navigation, and graphical elements that enhance the learning experience. By prioritizing an intuitive layout and clear navigation, we can reduce users' cognitive load, ultimately improving the accessibility of information. (Baharuddin et al., 2013). Additionally, van Schaik and Ling (2009) demonstrate that clear typography and appropriate use of color can improve readability and visual comfort, directly contributing to a better user experience.

User satisfaction is one of the main indicators of UX success. Han & Finkelstein (2013) found that high levels of user satisfaction are often associated with better user retention and sustained platform usage. Therefore, it is important for developers to adopt a user-centered design approach when optimizing UI and UX. Designs that prioritize users' needs and preferences tend to result in more effective and satisfying platforms (Perez-Enriquez et al., 2024; Kraft, 2012). While optimizing UI and UX presents numerous advantages, it also poses significant challenges that must be navigated. A primary challenge is achieving a balance between aesthetics and functionality, ensuring that the

platform remains visually appealing without sacrificing usability. Additionally, tailoring personalization and adapting content according to user preferences are crucial factors in enhancing user engagement and satisfaction. Recent research by (He et al., 2024) shows that personalization and adaptation, such as relevant content recommendation features and customizable layouts, can significantly enhance the user experience. These features not only increase user engagement with the platform but also help meet individual users' needs, which in turn can improve satisfaction and retention.

This study aims to investigate students' experiences with UI/UX-based e-learning platforms. The research seeks to gain a deeper understanding of the challenges users encounter in online learning and to identify solutions that enhance the user experience for more effective learning outcomes. By examining factors such as navigation complexity, platform responsiveness, and user engagement, the goal is to create a more satisfying and immersive learning experience. Furthermore, this study will assess the extent to which UI/UX factors influence student satisfaction and participation in online learning.

It is essential to recognize that each online learning platform possesses its own distinct characteristics and complexities, meaning that the optimal approach to enhancing UI and UX will differ based on the specific needs and attributes of each platform. Research on UI and UX optimization within the realm of online education remains relatively scarce, particularly concerning the use of quantitative survey data. Therefore, this study will employ both a qualitative approach and a quantitative method in the form of surveys to gain a more comprehensive understanding of users' needs, challenges, and expectations regarding an online learning platform that supports the learning process.

In light of these challenges, this study aims to investigate students' experiences with UI/UX-based e-learning platforms, identify critical issues related to UI/UX, and recommend enhancements to improve user engagement and learning effectiveness. Specifically, the study seeks to: (1) identify key weaknesses in the UI/UX design of current e-learning platforms, (2) analyze the influence of UI/UX features on students' learning experiences, engagement, and overall satisfaction, (3) evaluate the impact of personalization and content adaptation on enhancing user experience, and (4) provide recommendations for refining UI/UX design to foster a more inclusive and user-friendly online learning environment.

This research aims to bridge the existing knowledge gap by employing a qualitative approach to gain deeper insights into user challenges and needs. It seeks to make meaningful contributions to the development of more effective and efficient online learning platforms. The findings are intended to offer concrete recommendations for online learning platform developers, enhancing the user experience and better aligning with their needs. By addressing these gaps, this research aspires to deliver actionable suggestions for e-learning platform developers and provide valuable insights for educational practitioners who are striving to optimize digital learning environments in higher education.

2. Methods

2.1. Research Design

This study employs a qualitative descriptive research approach, emphasizing the uniqueness of data rather than seeking generalization. The study aims to view reality as dynamic, shaped by the ideas and perceptions of the subjects involved (Sugiyono, 2017). A reflective analysis of the data collected is conducted, followed by the preparation of a comprehensive research report (Sugiyono, 2020). The qualitative descriptive method is applied, involving various data collection techniques such as observation and in-depth interviews (Pickering, 2008).

2.2 Population and Sample

This research was carried out at various universities in Jakarta that adopt distance learning and utilize e-learning platforms. A preliminary mapping was performed to identify those institutions that extensively implement online learning systems. The research team selected key informants from these universities through purposive sampling, choosing four individuals based on their active engagement with e-learning platforms. To maintain confidentiality, the names of the universities and participants are withheld and presented in Table 1.

Table 1. List of Informants

No	Informant	Age	University	Semester
1	Informant D	24	Private University	6th
2	Informant F	35	Public University	6th
3	Informant A	21	Private University	5th
4	Informant V	21	Public University	6th

Source: Researchers (2024).

2.3 Data Collection

Data collection involved conducting in-depth interviews with carefully selected informants. Each interview was recorded with the participants' consent and transcribed verbatim to ensure accuracy. The focus of the interview process was to gather insights into the participants' experiences, challenges, and perceptions regarding the UI/UX aspects of e-learning platforms. Additionally, observations were carried out to corroborate the findings from the interviews by examining how participants engage with e-learning platforms in real-life settings.

2.4 Data Analysis

Following the interviews, the recorded sessions were transcribed verbatim to maintain the authenticity of the data. The research team utilized a coding process to identify key themes and patterns that emerged from the data. This process involved categorizing responses into relevant themes that aligned with the research objectives. An iterative approach to coding, coupled with constant comparison across different transcripts, was employed to ensure consistency and depth in the analysis. In the final stage, the coded data was synthesized into a coherent narrative that encapsulated the underlying ideas and perceptions of the participants. This narrative was then examined reflectively to derive meaningful conclusions regarding the use of online learning platforms in the selected universities. The analysis aimed to provide insights into the specific challenges and advantages experienced by end-users, thereby contributing to a deeper understanding of e-learning implementation in higher education.

3. Results and Discussion

In the results and discussion section, we explore the current landscape of e-learning platforms utilized in both private and public universities. Our findings indicate that while these platforms are generally well-developed, there remains considerable scope for improvement. The research highlights the vital importance of optimizing User Interface (UI) and User Experience (UX) to ensure that these platforms effectively meet user needs and provide a fulfilling educational experience. Additionally, the study emphasizes the necessity of making periodic adjustments to User Experience, stressing that regular updates are essential for adapting to technological advancements and shifting user expectations. This continuous refinement is crucial for maintaining the relevance and effectiveness of e-learning systems in a constantly evolving educational environment.

3.1 The Importance of User-Interface and User-Experience Optimization in e-Learning

In the 21st century, educational platforms have become increasingly important with the advancement of technology and the ease of access to online learning. The government, through the Ministry of Education, Culture, Research, and Technology (2024) encourages each campus to develop Learning Management Systems (LMS) to facilitate online learning and promote ease of access to education for all citizens. One of the government's focuses is on the development of multimedia platforms that can provide stimulation and comfort for students' learning.

In other words, optimizing e-learning platforms has become a crucial need in modern education, especially in the rapidly evolving digital age (Asri et al., 2024). Talking about these platforms, there are two crucial elements that cannot be overlooked: User Experience (UX) and User Interface (UI). UI refers to the visual design and layout of the e-learning platform that addresses the needs of its users (Faudzi et al., 2023). Meanwhile, UX focuses on the overall user experience in interacting with the platform (Almonte et al., 2024). Both are closely related, with well-designed UI facilitating a positive UX, thereby supporting the effectiveness of online learning (Stephani et al., 2023). This is also the basis for conducting this research.

The importance of UI/UX in e-learning lies in its ability to enhance user engagement. An intuitive and user-friendly UI facilitates students in navigating, finding the necessary materials, and completing their assignments and exams more efficiently. This is in line with the findings of Yalcin and Kutlu (2019) that increasing user engagement in an LMS requires users to have the intention to use it. This intention is influenced by their perception of its usefulness, ease of use, and social norms. Additionally, perceived usefulness is shaped by ease of use, social norms, and user interface design. Meanwhile, ease of use largely depends on the user interface design and the user's confidence in operating a computer.

Meanwhile, a positive UX creates a comfortable learning environment, allowing students to focus on their studies without technical disruptions or navigation difficulties (Alanazi et al., 2020; Taat & Francis, 2019). By considering the user's point of view, it will reduce the complexity of e-learning that can hinder the learning process(Curum & Khedo, 2021). In this context, understanding users' needs, capabilities, and limitations is crucial for designing effective and efficient user interfaces (UI) and user experiences (UX). Each user, whether a lecturer or a student, has different backgrounds,

learning styles, and preferences. Therefore, UI/UX designed without considering these differences can lead to suboptimal learning experiences and even cause difficulties for users.

Additionally, optimizing UI/UX in e-learning plays a crucial role in fostering inclusivity and accessibility. Designs that take into account the diverse needs of users, particularly those with physical limitations, ensure equitable access to learning materials for all students. Ultimately, enhancing UI/UX not only supports educational objectives but also boosts user satisfaction, which can lead to improved academic outcomes and greater overall success for educational institutions.

This study examines the significance of optimizing the User Interface (UI) in e-learning platforms, with a focus on student experiences. This subsection will specifically address findings related to UI. As previously mentioned, UI pertains to the visual design of a platform. The research findings indicate a strong correlation between UI and accessibility in online learning environments. In the context of online education, accessibility refers to the ability of all users—regardless of physical conditions, devices used, or geographical locations—to fully access and engage with e-learning platforms. The study demonstrates that effective accessibility not only facilitates students in accessing materials and interacting with lecturers but also enhances their engagement and motivation throughout the learning process.

Public University C (PUC) serves as an exemplary model for accessibility in its e-learning platform. According to Informant F, a student at PUC, the platform is easily accessible across a variety of devices, including smartphones. This flexibility allows students to access materials, engage in discussions, and complete assignments anytime and anywhere, without being restricted to specific devices such as laptops or desktop computers. Informant F also emphasized that the responsive user interface of PUC's platform, which functions well on devices ranging from mobile screens to laptops, is one of the key strengths of this e-learning system.

This is not surprising since PUC is indeed recorded in history as a pioneering state university in distance learning. The university was established on September 4, 1984, and its development blueprint follows the model of The Open University in the UK (Universitas Terbuka, 2023). Informant F highlighted the effective color selection that complements both the university logo and the e-learning interface, noting that it is visually soothing. While PUC is recognized as a pioneer in this area, private universities are also advancing in terms of accessibility. Informant D from Private University B (PUB) pointed out that the platform’s interface is exceptionally user-friendly, enabling users to navigate through learning materials effortlessly and without confusion.

Other private institutions, such as Private University A (PUA), are recognized for providing high-quality education by ensuring that students have access to a variety of course materials, assignments, and discussion forums. This insight was shared by Informant A Swerli, a student at PUA, who highlighted that this accessibility plays a significant role in sustaining his enthusiasm for learning. Regarding visual design, Informant A pointed out that, despite individual preferences, the e-learning platform at PUA delivers a visually appealing experience. For example, the use of red in the platform's design does not create readability issues, provided it is implemented correctly.

Despite the commendable accessibility offered by these platforms, there is still significant room for improvement, particularly in terms of inclusivity. A key area is the accessibility for students with special needs. For instance, while PUC's platform is notably responsive and user-friendly, it does

not adequately cater to students with disabilities, such as those who are visually or hearing impaired. Current findings suggest that features specifically designed to assist students with visual or auditory impairments are lacking. This absence of tailored features for disabled students diminishes the overall inclusivity of the e-learning platform. Accessibility should extend beyond general ease of use to encompass inclusivity for all users, particularly those with special needs.

According to government data, there are about 22.97 million hearing-impaired individuals in Indonesia (Supanji, 2023). Although various disabilities require attention, the hearing-impaired are one group that could benefit from optimizing UI in e-learning platforms. Kotwal et al., (2022) recommend several strategies to address the needs of hearing-impaired learners, including incorporating sign language, video subtitles, and creating specialized applications for hearing-impaired students. This is also in line with the recommendations of the Web Content Accesibility Guideliness - WCAG (2024) which encourages the design of website content to be more accessible to people with disabilities. According to the WCAG guidelines, user interfaces must adhere to the POUR principles: Perceivable, ensuring that information and interactive controls are accessible to everyone; Operable, guaranteeing that all controls and interactive elements are usable; Understandable, making certain that content and controls do not create ambiguity or confusion; and Robust, allowing content to be interpreted across various software, including those tailored for individuals with disabilities. A key requirement is the inclusion of subtitles, which serve as synchronized visual and text-based alternatives for both spoken and non-speech audio information necessary for comprehending media content.

The accessibility of e-learning platforms is generally commendable, particularly in terms of user interface design, which optimizes fonts, logos, and colors for user comfort. However, there are still significant challenges regarding technical reliability. One major issue is that servers often experience disruptions, especially during peak usage when many users access the platform simultaneously. This hampers the overall online learning experience. PUA (Private University A) is one institution grappling with similar difficulties. While the platform is user-friendly and well-structured, Informant A Swerli highlighted that server downtime poses a significant barrier to consistent accessibility: “Server downtime often occurs near deadlines, almost every week, and it's getting worse now.” (Personal Interview with Informant A, 2024).

The second issue pertains to the compatibility of the Moodle system utilized for e-learning development. It appears that this system encounters difficulties with the iPhone operating system (iOS). Informant D, who uses iPhones and tablets, expressed this concern: “One problem that I occasionally find inconvenient is when I have to attend meetings in different locations and work on assignments simultaneously. I sometimes access the platform via my iPad, but I am unable to access the PDF section.” (Personal Interview with Informant D, 2024).

A well-crafted user interface (UI) is a crucial aspect of an accessible e-learning platform; however, the overall user experience (UX) is also significantly influenced by the platform’s technical reliability. For instance, students at Private University A have faced frequent server outages, particularly as deadlines approach. Such disruptions not only undermine the effectiveness of a thoughtfully designed UI but also detrimentally affect the overall UX. Consequently, technical issues related to system compatibility can result in a frustrating experience for users. This is in line with the

findings of Leonnard (2021), which indicate that the quality of technical systems in e-learning platforms has an important role in influencing student satisfaction. Furthermore, Hasani et al. (2020) suggestion should be considered where in addition to focusing on the UX of an e-learning platform, it is also important to involve subject matter experts so that technical problems can be mitigated early.

Interruptions in the learning experience can lead to increased user frustration and hinder the achievement of learning goals. The argument is supported by research conducted by Federman (2019) where he shows that common disruptions in e-learning, such as system crashes, slow loading times, and unexpected technical problems, can have an impact on students' concentration and learning intentions. The implication is that learners who frequently encounter disruptions are more likely to become disengaged with e-learning, ultimately hindering their learning process. To create an optimal user experience (UX), it is essential that the user interface (UI) design is backed by a reliable infrastructure, fostering a learning ecosystem that is not only accessible but also stable and dependable. To effectively address these challenges, educational institutions should focus on continually developing and optimizing their e-learning platforms with the needs of students in mind.

Based on this finding, we recommend that universities offering distance learning courses establish a technical support team available 24/7. This team should consist of academic staff who are well-versed in the complexities of e-learning, rather than lecturers, to ensure they can effectively assist with any technical issues that may arise. It's crucial to emphasize that this support team should comprise real individuals, not chatbots, so that they can provide appropriate and nuanced responses. (Chen et al., 2023; Lei et al., 2021).

Efforts in this area may include the development of specialized features for students with disabilities, increasing server capacity to prevent disruptions during peak traffic, and designing a responsive user interface across multiple devices. These optimizations not only enhance accessibility but also have a direct positive impact on user experience. By incorporating an effective user interface and well-designed user experience, e-learning platforms can provide a more intuitive, enjoyable, and impactful learning journey, ultimately improving student engagement and educational outcomes. Additionally, addressing the needs of individuals with disabilities is particularly crucial, as research by various scholars indicates that Indonesia ranks low in terms of inclusion within the information and technology sector, especially for people with disabilities. (Al. Jumroh & Rumaf, 2021; Poerwanti et al., 2024).

In this discussion, while a well-crafted user interface (UI) design is essential for establishing an accessible e-learning platform, the overall success of the user experience (UX) is significantly influenced by the platform's technical reliability. A pertinent example of this issue is the frequent server disruptions faced by students at Private University A, particularly during deadline periods. This illustrates that even with a thoughtfully designed UI, technical challenges such as unstable servers can greatly undermine the UI's effectiveness and negatively impact the overall UX. Additionally, other technical issues, including poor system compatibility, contribute to user discomfort and frustration, obstructing learning objectives and diminishing the quality of the educational experience.

To achieve optimal user experience in e-learning platforms, it is essential to balance UI design with a reliable and robust technical infrastructure. Educational institutions must take these challenges

seriously, ensuring that their platforms not only incorporate responsive and inclusive designs but also possess sufficient server capacity and specialized features to meet the diverse needs of all students. By implementing these enhancements, e-learning platforms can offer a more intuitive, enjoyable, and effective learning experience, ultimately improving student engagement and learning outcomes.

3.2 The Importance of Regular User Experience Adjustments in e-Learning

This research explores the user experience (UX) related to the flexibility and challenges encountered when using e-learning platforms. The primary focus is on how these platforms adapt to different devices, especially mobile devices, and how these adaptations influence students' flexibility and comfort during the e-learning process.

The remarkable expansion of online learning platforms has transformed global access to education. Nonetheless, the vast array of course offerings can present challenges for students with lower cognitive abilities. To address this issue, a proposed solution is the implementation of an adaptive and personalized recommendation system within an adaptive e-learning framework. (Amin et al., 2024). User flexibility can also be supported through the use of social media, as it has been shown to enhance students' learning self-efficacy. Experiments have demonstrated a significant improvement in dimensions such as perceived ability, effort, environment, control, interest, and confidence following social media-based interventions (He et al., 2024). Users, particularly students, who utilize various devices to access learning materials, engage with instructors, and complete assignments often encounter challenges when employing features on their mobile devices. Although the user interface layout and elements are well-designed, some critical features—such as icons and navigation—can remain unclear or difficult to access on mobile devices. As Informant V remarked, "For me, the icons are small and positioned at the edge, so many may not see or notice them." (Personal Interview with Informant V, 2024).

The alignment between desktop and mobile designs plays a crucial role in enhancing the user experience (UX). Misalignment can lead to confusion and frustration, particularly for users who frequently alternate between desktop and mobile devices. This disparity requires users to accommodate different layouts and feature placements, which can hinder their flexibility and diminish the efficiency of the learning process. Although the essential features are present, the way these features are displayed on mobile devices still needs refinement to enhance user-friendliness. When user interface elements are not optimized for mobile, users may face challenges in locating and utilizing available features, ultimately impacting the overall quality of their experience.

In addition, while the interface is intuitive and generally responsive, the user experience can be adversely affected by factors such as the consistency of design across desktop and mobile views, as well as the platform’s technical performance during peak usage periods. The majority of students interviewed in this research expressed a level of comfort with the platform’s appearance. However, despite this basic comfort, issues with flexibility and responsiveness persist, particularly when users encounter surges in server load or other technical difficulties that impact speed and ease of access.

Flexibility is a crucial element in the realm of online learning. This concept encompasses not only the platform's capacity to accommodate different devices and user preferences but also the users' ability to access learning materials anytime and anywhere. Such flexibility empowers users to study at their own pace and on their own schedule, ultimately enhancing their motivation and engagement. (Müller et al., 2023). Students have the flexibility to train at any time without needing to attend physically, allowing them to engage with scenarios as often as necessary, which offers significant opportunities to enhance their skills and knowledge (Awada et al., 2024). In their research,

it was found that flexibility in online learning allows users to manage their own learning schedules, which is one of the key factors in the success of online learning.

Flexibility in e-learning extends beyond simply offering a range of online learning features; it also encompasses the ability of the platform to meet the diverse needs and expectations of students. It is essential to recognize that students who engage in online learning come from varied backgrounds; some are full-time students, while others balance their studies with work commitments. In this new model, students have the autonomy to choose each week how they wish to attend classes—either fully online or on campus. Throughout the transition to this new approach, maintaining on-campus delivery has remained a crucial aspect. (Littlefield & Donovan 2019). E-learning development must take into account not only the comprehensiveness of features but also how these features can offer flexibility and ease for all students without overwhelming them. Flexibility in online learning allows users to tailor their learning activities around their individual personal or professional commitments. This is especially advantageous for those with limited time, such as working individuals or parents, as they can access materials at any time without being confined to a rigid schedule. (Littlefield & Donovan 2019). This flexibility also accommodates different learning paces among users, allowing them to take enough time to understand more complex concepts without the pressure of strict time constraints.

Ferreira et al. (2023) emphasize that UX issues will continue to exist because platform developers do not fully understand the real problems faced by students as users in their routines. This limitation presents a challenge in UI/UX design and development, where user experience (UX) issues are often only identified post-implementation. As a result, despite having a secure and user-friendly interface (UI) with available features, the overall user experience can remain suboptimal because these issues are frequently overlooked until the final stages. This underscores the importance of maintaining ongoing engagement between developers and end-users. (Cajander et al., 2022).

Informant D, a student who also operates a daily business, raised a compelling point that highlights the disparity between developers and users. From the developer's perspective, interactivity in e-learning is crucial and will continue to evolve. However, while interactivity can be a valuable tool in the learning process, there is a threshold beyond which excessive development may negatively impact users. As D noted, "For some students with demanding jobs, they simply want the practical information. In such cases, overly interactive elements might actually be a drawback." (Personal Interview with Informant D, 2024).

This illustrates that while incorporating interactive elements can enhance the learning experience, an excess of such features may hinder the learning process for individuals with time constraints or those who prefer to complete tasks swiftly. Interactive learning environments play a vital role in contemporary education, providing personalized and efficient platforms for teaching and learning. (Aung et al., 2024). Here, Therefore, it is important for e-learning platform developers to find a balance between providing interactivity that supports learning and maintaining simplicity and efficiency in usage so that the platform remains flexible and meets the diverse needs of users.

There is no denying that user flexibility in accessing online learning platforms is one of the most important elements, especially when integrating learning activities with a busy daily routine routine (Riatun & Alvin, 2023; Stephani et al., 2023). E-learning platform developers should create a seamless learning experience (Hambrock et al., 2022) where someone can continuously learn and consciously bridge their diverse learning efforts across different locations, times, technologies, or social environments. In the realm of user experience (UX), ensuring that users have barrier-free access across various devices embodies the principles of seamless learning. This approach emphasizes design optimization that promotes flexibility and continuity in online education. If e-learning platforms fail to prioritize these elements, user frustration is likely to rise, ultimately diminishing the effectiveness of the learning process.

University students, as users, should not encounter design barriers that impede quick access to the learning information or features they need, particularly during transitions from desktop to mobile or vice versa. Cross-platform flexibility is essential to ensure that users can access online learning platforms on a variety of devices, including computers, tablets, and smartphones. This multi-platform capability enables users to continue their learning seamlessly across different devices without losing progress or compromising the quality of the learning experience.(Conrad & Openo, 2018). With multi-platform features, users have the freedom to learn in various situations, whether at home, on the go, or at work, making learning more inclusive and accessible to a wider audience. (Natda, 2013) Emphasizes the importance of adaptive design for various screen sizes to ensure a consistent user experience across all devices. This approach allows the platform to deliver a smooth and uninterrupted experience, regardless of the device used by the user.

As technology advances, flexibility in the use of online learning platforms also includes the ability to access learning materials through various formats, such as video, audio, and text, which can be selected according to user preferences (Means et al., 2013). This not only improves access to learning materials but also enables users to select the learning methods that align best with their personal styles, thereby enhancing the overall effectiveness of their learning experience. The following statements emphasize the significance of infrastructure management that can accommodate user flexibility, particularly when numerous users are accessing the platform at the same time.

According to Ovesleová et al (2024), there are two approaches that can be taken, indirect and direct. The indirect approach can be done by preparing documents containing various explanations of the problems that students may encounter. Meanwhile, the direct approach involves providing students with contact information to report issues and receive solutions to problems encountered on the e-learning platform.

From a UX perspective, this research highlights that flexibility is a vital aspect for students using e-learning platforms. By prioritizing display adjustments, user needs, responsiveness, and design alignment, platform providers can facilitate easy and convenient access to all essential features, regardless of time or location. This not only enhances user satisfaction but also bolsters their success in achieving learning objectives. Overall, optimizing both UI and UX is crucial for developing an effective online learning platform. A well-integrated UI and UX create a satisfying user experience, ultimately improving the effectiveness of online education. Therefore, it is essential for developers to continuously update and refine platform designs based on user feedback, ensuring that the resulting design offers an inclusive and gratifying experience for all users. (Sullivan et al., 2024; Rodríguez-Galván et al. 2024). As technology evolves, these challenges will persist, but with the right approach, developers can create a platform that is not only effective but also capable of delivering an optimal learning experience for its users.

One of the key findings from this research indicates that while the user interface (UI) of e-learning platforms is regarded as secure and user-friendly, with features designed to accommodate the needs of online learners, the user experience (UX) remains suboptimal and requires further enhancement. This suggests potential shortcomings in the flexibility of the learning experience available to students on these platforms. Furthermore, the research highlights that the responsiveness in addressing student issues is a critical component of user flexibility that can significantly impact the overall UX. In situations where the platform suffers delays or crashes during peak usage times, such as right before assignment deadlines, there is a pressing need for assistance.

Previous research has shown that flexibility in e-learning plays a crucial role in enhancing user motivation and engagement. Awada et al. (2024) found that flexibility in online learning allows students to adjust their schedules, while Müller et al. (2023) emphasized that flexible access to learning materials improves learning outcomes. However, a major challenge that remains is the gap

in user experience (UX), particularly regarding platform responsiveness and design consistency across devices. Ferreira et al. (2023) revealed that developers' limited understanding of users' daily challenges results in a suboptimal UX, whereas Cajander et al. (2022) highlighted the importance of user involvement in the platform development process to ensure a smoother learning experience. Additionally, Littlefield & Donovan (2019) pointed out that hybrid learning models, which offer flexibility between online and face-to-face learning, still pose challenges in designing inclusive UI/UX frameworks.

This research reveals that although e-learning platforms are equipped with essential features, users still encounter substantial challenges related to complex navigation, inconsistent design between desktop and mobile interfaces, and responsiveness issues during periods of high user activity. Many students find it difficult to access icons on mobile devices due to their small size and suboptimal placement. Additionally, variations in layout structures across different devices compel students to continually readjust, ultimately diminishing their efficiency and engagement in online learning. These findings reinforce the study by Ovesleová et al. (2024), which proposed direct and indirect approaches to addressing students' technical difficulties. Furthermore, while interactive features can enhance the learning experience (Aung et al., 2024), excessive interactivity may hinder efficiency for students with limited time. Therefore, achieving a balance between interactivity and efficiency in UI/UX design is essential to ensure that e-learning platforms accommodate students with diverse backgrounds and learning preferences.

4. Conclusion

This research identifies critical areas for improvement in university e-learning platforms, specifically in User Interface (UI) and User Experience (UX). While both public and private institutions have made significant advancements in platform development, challenges remain, particularly concerning technical issues such as server stability, device compatibility, and accessibility for students with disabilities. The findings emphasize that enhancements in UI/UX should go beyond mere visual appeal to encompass a robust technical infrastructure, ensuring a seamless and reliable user experience. Regular updates are essential for keeping up with technological advancements and evolving user expectations, particularly in optimizing platform flexibility and responsiveness across diverse devices. Moreover, this study highlights the importance of fostering inclusivity in e-learning design. Although some platforms have demonstrated a commitment to accessibility, notable gaps persist in features that support students with disabilities. By addressing these UI/UX challenges, educational institutions can create a more inclusive and effective learning environment, enabling all users regardless of their technical or physical limitations to engage fully in the learning process without barriers. Furthermore, this research underscores the need for recommendations aimed at improving inclusivity in e-learning design, especially for students with special needs. By tackling various aspects of UI and UX and ensuring that e-learning platforms meet the needs of all users, including those with physical limitations, educational institutions can cultivate a more inclusive and effective learning environment. Therefore, the ongoing development of e-learning platforms should be prioritized to ensure that all users can fully engage with the system without obstacles.

5. References

Al Jumroh, S. F., & Rumaf, N. (2021). E-learning As an Innovation Model for Disabilities (Defective Vision). *Interaction: Jurnal Pendidikan Bahasa, 8*(1), 148–154. https://doi.org/10.36232/jurnalpendidikanbahasa.v8i1.903.

Alanazi, A. A., Frey, B. B., Niileksela, C., Lee, S. W., Nong, A., & Alharbi, F. (2020). The Role of Task Value and Technology Satisfaction in Student Performance in Graduate-Level Online Courses. *TechTrends, 64*(6), 922–930. https://doi.org/10.1007/s11528-020-00501-8.

Almonte, R. G., Montiano, A. M., Cerequillo Salili, P. B., Garcia, L. M., Hipolito, R. R., & Fernando, A. H. (2024). User Experience on a Culture-Based Learning Management System: Students' Perspective. *2024 12th International Conference on Information and Education Technology (ICIET)*, 452–456. https://doi.org/10.1109/ICIET60671.2024.10542770.

Amin, S., Uddin, M. I., Alarood, A. A., Mashwani, W. K., Alzahrani, A. O., & Alzahrani, H. A. (2024). An adaptable and personalized framework for top-N course recommendations in online learning. *Scientific Reports, 14*(1), 1–14. https://doi.org/10.1038/s41598-024-56497-1.

Asri, F. H. M., Singh, D., Mansor, Z., & Norman, H. (2024). A Review of Cross-Cultural Design to Improve User Engagement for Learning Management System. *KSII Transactions on Internet and Information Systems, 18*(2). https://doi.org/10.3837/tiis.2024.02.007.

Aung, S. T., Funabiki, N., Aung, L. H., Kinari, S. A., Mentari, M., & Wai, K. H. (2024). A study of learning environment for initiating Flutter app development using Docker. *Information (Switzerland), 15*(4). https://doi.org/10.3390/info15040191.

Awada, Imad Alex, Adina Magda Florea, and Alexandru Scafa-Udriște. 2024. A Virtual Case Presentation Platform: Protocol Study. *Methods and Protocols, 7*(2). doi: 10.3390/mps7020023.

Baharuddin, R., Singh, D., & Razali, R. (2013). Usability Dimensions for Mobile Applications-A Review. *Research Journal of Applied Sciences, Engineering and Technology, 11*(9), 2225–2231. https://doi.org/10.19026/rjaset.5.4776.

Cajander, Å., Larusdottir, M., & Geiser, J. L. (2022). UX professionals' learning and usage of UX methods in agile. *Information and Software Technology*, 151, 107005. https://doi.org/10.1016/j.infsof.2022.107005.

Chen, S., Li, X., Liu, K., & Wang, X. (2023). Chatbot or human? The impact of online customer service on consumers' purchase intentions. *Psychology & Marketing, 40*(11), 2186–2200. https://doi.org/10.1002/mar.21862.

Conrad, D., & Openo, J. (2018). *Assessment Strategies for Online Learning: Engagement and Authenticity*. Canada: Athabasca University Press. https://doi.org/10.15215/aupress/9781771992329.01.

Curum, B., & Khedo, K. K. (2021). Cognitive load management in mobile learning systems: principles and theories. *Journal of Computers in Education, 8*(1), 109–136. https://doi.org/10.1007/s40692-020-00173-6.

Faudzi, M. A., Cob, Z. C., Omar, R., Sharudin, S. A., & Ghazali, M. (2023). Investigating the User Interface Design Frameworks of Current Mobile Learning Applications: A Systematic Review. *Education Sciences, 13*(1). https://doi.org/https://doi.org/10.3390/educsci13010094.

Federman, J. E. (2019). Interruptions in online training and their effects on learning. *European Journal of Training and Development, 43*(5/6), 490–504. https://doi.org/10.1108/EJTD-10-2018-0100.

Ferreira, B., Marques, S., Kalinowski, M., Lopes, H., & Barbosa, S. D. J. (2023). Lessons learned to improve the UX practices in agile projects involving data science and process automation. *Information and Software Technology*, 155, 107106. https://doi.org/10.1016/j.infsof.2022.107106.

Hambrock, H., de Villiers, F., Power, R., Koole, M., Ahmed, M. A., Ellis, W., Karim, R. A., Kurubacak, G., El-Hussein, M. O., Ossiannilsson, E., Sharma, R., Sousa, M. J., & Wollin, U. (2022). *Seamless learning in higher education 2(e-book)*. International Association for Mobile Learning and Power Learning Solutions. https://pressbooks.pub/seamlesslearning2/.

Han, J. H., & Finkelstein, A. (2013). Understanding the effects of professors' pedagogical development with Clicker Assessment and Feedback technologies and the impact on students' engagement and learning in higher education. *Computers & Education, 65*, 64–76. https://doi.org/10.1016/j.compedu.2013.02.002.

Hasani, L. M., Sensuse, D. I., Kautsarina, & Suryono, R. R. (2020). User-Centered Design of e-Learning User Interfaces: A Survey of the Practices. *2020 3rd International Conference on Computer and Informatics Engineering (IC2IE)*, 1–7. https://doi.org/10.1109/IC2IE50715.2020.9274623.

He, X., Liu, Q., & Jung, S. (2024). The Impact of Recommendation System on User Satisfaction: A Moderated Mediation Approach. *Journal of Theoretical and Applied Electronic Commerce Research, 19*(1), 448–466. https://doi.org/10.3390/jtaer19010024.

Ministry of Education, Culture, Research, and Technology. (2024). Panduan Program Bantuan Pengembangan dan Penyelenggaraan Pembelajaran Digital. In Dikti. https://spada.kemdikbud.go.id/berita/penawaran-program-bantuan-pengembangan-dan-penyelenggaraan-pembelajaran-digital-tahun-2024-16.

Kotwal, R., Chauhan, G. S., & Ghosh, S. (2022). Challenges and Opportunities in Online Learning Amid COVID-19: A Study on Hearing–Speech Impaired Students of Jammu and Kashmir. *Media Watch, 13*(1). https://doi.org/https://doi.org/10.1177/09760911221086356.

Kraft, C. (2012). *User Experience and Why It Matters. In User Experience Innovation*. New York: Apress eBooks. https://doi.org/10.1007/978-1-4302-4150-8.

Law, E. L.-C., Roto, V., Hassenzahl, M., Vermeeren, A. P. O. S., & Kort, J. (2009). Understanding, scoping and defining user experience. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 719–728. https://doi.org/10.1145/1518701.1518813.

Lei, S. I., Shen, H., & Ye, S. (2021). A comparison between chatbot and human service: customer perception and reuse intention. *International Journal of Contemporary Hospitality Management, 33*(11), 3977–3995. https://doi.org/10.1108/IJCHM-12-2020-1399.

Leonnard, L. (2021). Exploring Relationship among E-Learning Platforms, Technical System Quality and Perceived Students' Satisfaction on Higher Educations' System for E-Learning. *Jurnal Manajemen Teori Dan Terapan/ Journal of Theory and Applied Management, 14*(1), 16. https://doi.org/10.20473/jmtt.v14i1.24183.

Littlefield, C., & Donovan, S. (2019). *Fitting Flexibility Across the Curriculum. Hybrid-Flexible Course Design Implementing Student-Directed Hybrid* Classes, 144–152. California: edtechbooks.org

Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The Effectiveness of Online and Blended Learning: A Meta-Analysis of the Empirical Literature. *Teachers College Record: The Voice of Scholarship in Education, 115*(3), 1–47. https://doi.org/10.1177/016146811311500307.

Müller, C., Mildenberger, T., & Steingruber, D. (2023). Learning effectiveness of a flexible learning study programme in a blended learning design: why are some courses more effective than others? *International Journal of Educational Technology in Higher Education, 20*(1), 10. https://doi.org/10.1186/s41239-022-00379-x.

Natda, K. V. (2013). Responsive web design. *Eduvantage, 1*(1), 18–25. https://doi.org/10.11635/2319-9954/1/1/18.

Ovesleová, H., Posavec-Malok, D., Javůrková, J., Polášková, A., ěnička, J., Nikl, T., Fuglík, V., Švejda, V., & Moravcová, A. (2024). *Learning Support System: A Practical Guide to E-learning at CU*. https://publications.cuni.cz/handle/20.500.14178/2505.

Perez-Enriquez, Mario, Jose Luis Lopez-Cuadrado, and Israel Gonzalez-Carrasco. 2024. Platform for Accessible Online Learning. *ACM International Conference Proceeding Series*, (9), 1-4. doi: 10.1145/3657242.3658603.

Pickering, M. (Ed.). (2008). *Research methods for cultural studies*. United Kingdom: Edinburgh University Press Ltd.

Poerwanti, S. D., Makmun, S., & Dewantara, A. D. (2024). Jalan Panjang Menuju Inklusi Digital bagi Penyandang Disabilitas di Indonesia. *Journal of Urban Sociology, 1*(1), 44. https://doi.org/10.30742/jus.v1i1.3536.

Riatun, R., & Alvin, S. (2023). Evaluasi pengalaman belajar mahasiswa dalam pembelajaran jarak jauh: studi kasus di umn. *Academy of Education Journal, 14*(2), 423–434. https://doi.org/10.47200/aoej.v14i2.1707.

Rodríguez-Galván, Lilia Carolina, Asad Abbas, Anil Yasin Ar, Beatriz Garza-González, and Patricia Esther Alonso-Galicia. 2024. Do Sentiments of Professors Feedback Change after Migrating from In-Person to Online Modalities? Pre- and during COVID-19 Experience. *Universal Access in the Information Society, 23*(3), 1193–1202. doi: 10.1007/s10209-022-00943-2.

Stephani, N., Alvin, S., & Riatun. (2023). Exploring college students' motivations for choosing online learning program. *Cogent Education, 10*(2). https://doi.org/10.1080/2331186X.2023.2266206.

Sullivan, Clare C., Daire M. O'Leary, Fiona M. Boland, Claire M. Condron, Claire M. Mulhall, and Walter J. Eppich. (2024). A Comparative Analysis of Student, Educator, and Simulated Parent Ratings of Video-Recorded Medical Student Consultations in Pediatrics. *Advances in Simulation, 9*(1), 1–11. doi: 10.1186/s41077-024-00282-7.

Sugiyono. (2017). *Metode penelitian kuantitatif kuantitatif dan R&D*. Bandung: Alfabeta.

Sugiyono. (2020). *Metode penelitian kualitatif*. Bandung: Alfabeta.

Supanji, T. H. (2023). *Pemerintah Penuhi Hak Penyandang Disabilitas di Indonesia.* Jakarta: Kemenko PMK. https://www.kemenkopmk.go.id/pemerintah-penuhi-hak-penyandang-disabilitas-di-indonesia.

Taat, M. S., & Francis, A. (2019). Factors Influencing the Students' Acceptance of E-Learning at Teacher Education Institute: An Exploratory Study in Malaysia. *International Journal of Higher Education, 9*(1), 133. https://doi.org/10.5430/ijhe.v9n1p133.

Universitas Terbuka. (2023). *Sejarah UT Tentang UT*. Jakarta: Universitas Terbuka. https://www.ut.ac.id/sejarah-ut/.

Van Schaik, P., & Ling, J. (2009). The role of context in perceptions of the aesthetics of web pages over time. *International Journal of Human-Computer Studies, 67*(1), 79–89. https://doi.org/10.1016/j.ijhcs.2008.09.012.

Yalcin, M. E., & Kutlu, B. (2019). Examination of students' acceptance of and intention to use learning management systems using extended TAM. *British Journal of Educational Technology, 50*(5), 2414–2432. https://doi.org/10.1111/bjet.12798.