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A Contextual Framework for User Interface Design in eLearning Platforms: Guidelines for Malaysian Higher Learning Institutions

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Abstract

The swift integration of eLearning platforms in Malaysian higher learning institutions (HLIs) highlights the crucial role of user interface design (UID) in ensuring academic lecturers' adoption, engagement, and usability. Although the implementation has been widespread in Malaysia, findings show that many eLearning platforms display inconsistent layouts, unintuitive navigation, and limited accessibility. This results in low satisfaction among academic lecturers and underutilization of available features. Based on a mixed-method research approach that included direct observations, survey questionnaires (n = 200), and semi-structured interviews with academic lecturers from selected private HLIs, this study proposes UID guidelines for eLearning platforms in Malaysia's HLIs. The proposed guidelines were established based on the ADDIE model and the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which both models aim to integrate pedagogical alignment with practical usability. Results from the findings show recurring issues, including excessive textual content, unclear flow of information, unorganized navigation, and limited integration of interactive functions. The proposed UID guidelines comprise main features such as clarity and readability, intuitive navigation, accessibility, interactive engagement, functional efficiency, consistency, and adaptability to local contexts. Therefore, by addressing these identified design shortcomings, the proposed framework enhances academic lecturers' interaction with eLearning platforms, supports more effective teaching and learning practices, and encourages better engagement. Furthermore, this study contributes to Sustainable Development Goal 4 (SDG4) on Quality Education, which supports inclusive, user-centered digital learning environments that facilitate equal access and foster lifelong learning opportunities. With implications for design practices, policy development, and future technological adoption strategies in higher education, the study offers a context-specific and research-informed basis for enhancing eLearning platform interfaces in Malaysian HLIs.

Keywords: User Interface Design, eLearning, Higher Learning Institutions, Malaysia, SDG 4

Introduction

The digital transformation of higher education has positioned eLearning platforms at the forefront of instructional delivery worldwide. In Malaysia, the rapid expansion of these platforms has been recognized as a critical drive for Industrial Revolution (IR) 4.0. This expansion aligns with the national agenda and the global commitment to Sustainable Development Goal 4 (SDG 4). SDG 4 emphasizes the inclusivity and equitable quality education (Miya & Govender, 2022; Okocha & Odinko, 2021). Bujang et al. (2020) highlight that Malaysia is recognized as one of the countries that are actively advancing IR 4.0 initiatives by embracing globalization and leveraging technology-driven strategies to enhance economic growth. Universities with campus-based systems are increasingly embedding eLearning into the teaching and learning practices. This integration serves both to create a more dynamic learning environment and to broaden the appeal of higher education to a broader range of prospective students (Bargash et al., 2022; Clarizia et al., 2018). However, the effective integration of eLearning still faces significant barriers, especially in the context of user interface design (UID), which directly influences academic lecturers' adoption and sustained engagement (Miya & Govender, 2022).

Despite the widespread implementation of eLearning, there are several challenges that persist in the usability and acceptance of eLearning platforms, especially among academic lecturers in Malaysian higher learning institutions (HLIs). One of the challenges is that UID has not been a priority in many institutional strategies, thus resulting in layout inconsistency, excessive texts, unintuitive navigation, and interactivity. These issues negatively impact the usability of eLearning and discourage academic lecturers from fully exploiting available features. This lack of attention to UID contributes to difficulties in navigation, limited accessibility, and reduced engagement, thereby affecting teaching effectiveness. Apart from that, much existing research has concentrated more on the students' experiences rather than academic lecturers' perspectives, who also play a central role in shaping the content and facilitating courses' teaching and learning. Furthermore, academic lecturers show different levels of acceptance toward eLearning systems, with some demonstrating resistance due to complex features, insufficient training, and inconsistent design standards (Okocha & Odinko, 2021). Thus, understanding the perspectives and experiences of academic lecturers in eLearning usage is still considered underexplored (Miya & Govender, 2022; Hasan, 2023). The absence of standardized UID guidelines tailored to the Malaysian higher education context further exacerbates these challenges, as academic lecturers in HLIs often encounter interfaces that fail to align with their teaching and learning needs, as well as institutional objectives (Moonsamy & Govender, 2018). Without clear design principles, eLearning adoption risks remaining fragmented, leading to suboptimal teaching delivery, lower satisfaction levels, and diminished trust in online learning practices (Mujalli et al., 2022). Therefore, without trust in fully online education, both the learning process and teaching practices face the risk of failure (Mujalli et al., 2022).

In order to fill these gaps, this study looks at how UID affects the adoption of eLearning among academic lecturers in Malaysian private HLIs. Based on observations, interviews, and survey data, the study suggests UID guidelines for eLearning platforms used by academic lecturers in Malaysia. Using the ADDIE model and the Unified Theory of Acceptance and Use of Technology (UTAUT) model as a guide, the guidelines aim to improve usability, functionality, and user engagement. By focusing on academic lecturers as the primary users, the study

stresses not only technological design but also pedagogical alignment, ensuring that platforms support professional practice and teaching effectiveness. The study supports SDG 4 which places an emphasis on inclusive and equitable quality education and opportunities for lifelong learning, requires addressing these issues. Malaysia runs the danger of failing to meet SDG 4 targets in the absence of an efficient and user-centered UID, especially when it comes to improving higher education's equity, quality, and accessibility. The ultimate goal is to improve the entire digital learning ecosystem in Malaysia and contribute to the realization of SDG 4 through more accessible and sustainable eLearning solutions (Gavrus et al., 2025).

Literature Review

Information and Communications Technology (ICT) integration has been positioned as a cornerstone of Malaysia's educational transformation agenda, particularly within the higher education sector. The Malaysia Education Blueprint underscores this in its 7th Shift, which highlights ICT as a driver of innovation in teaching and learning. Moreover, the 9th Shift introduces the Globalised Online Learning (GOL) initiative under the Malaysia Education Blueprint for Higher Education 2015–2025, which aims at expanding educational access while improving quality and efficiency. Meeting the challenges of 21st-century education, therefore, requires technology to be woven seamlessly into pedagogy, learning resources, and instructional practices (Abdul Rahman & Ahmad, 2025; Yeop et al., 2019). In Malaysia, the integration of eLearning in higher education has become a vital component in ensuring accessibility and flexible education, which aligns with Malaysia's efforts in embracing digital transformation. As technology becomes a central element in education worldwide, HLIs in Malaysia have responded by integrating online learning technologies into their teaching and academic programs (Ramli et al., 2021).

Previous studies have shown that lecturers' engagement with eLearning systems often relates to usability, design consistency, and the adaptability of user interfaces (Okocha & Odinko, 2021; Miya & Govender, 2022). Elearning platforms with poorly designed interfaces not only hinder teaching effectiveness but also discourage long-term adoption. Therefore, the need for standardized UID guidelines in HLIs must be emphasized. Moreover, recent comparative studies on Learning Management Systems (LMS) have shown significant differences in usability and adaptability across platforms such as Moodle, Blackboard, and Google Classroom. In a study by Abid et al. (2024), the research was conducted on a large-scale comparative analysis of LMSs by evaluating the functionality and user-friendliness across systems. The study found significant disparities in usability and accessibility that directly affected the learning outcomes. Santiadi et al. (2024) compare Moodle and Google Classroom by using the Technology Acceptance Model (TAM) as a guide and highlighted that perceived use and interface simplicity strongly influenced and affected users' satisfaction and acceptance. Apart from that, a study by Maluleke (2024) highlighted the Blackboard adoption within South African universities by stressing the persistent challenges of system usability, training gaps, and limited engagement features, which mirrored the issues faced in Malaysian private HLIs. Furthermore, Faudzi et al. (2023) reviewed the UID frameworks in mobile learning applications and argued that effective UID must align with principles of cognitive load reduction and accessibility to enhance users' engagement.

Moreover, previous research shows that inconsistent layouts, excessive textual content, and complex navigation remain as barriers in many eLearning platforms (Moonsamy & Govender,

2018; Miya & Govender, 2022). These limitations created fragmentation in terms of users' experiences and reduced the long-term sustainability of online teaching and learning initiatives, therefore reinforcing the significance of adopting models such as ADDIE for systematic design and UTAUT for analysing users' acceptance and ensuring that usability, as well as engagement principles, are embedded withing eLearning platforms across HLIs (McDonald, 2023; Yeop et al., 2019). Comparison table of previous studies related to eLearning and UID is shown in Table 1.

Table 1
Comparison Table of eLearning Studies

Author(s) and Year	**eLearning Platforms**	**Focus of Study**	**Key Findings**	**Relevance to UID**
Miya & Govender (2022)	General eLearning platforms	UX/UI design impact on learning	Highlighted that poor UI reduces engagement and accessibility	Shows UI is critical for adoption and learning outcomes
Mujalli et al. (2022)	General eLearning platforms	Trust and usability factors	Found that lack of trust in online platforms undermines teaching effectiveness	Links UI quality with confidence in online learning
Okocha & Odinko (2021)	Nigerian university eLearning	Usability and adaptability	Identified gaps in interface design affecting staff effectiveness	Demonstrates global relevance of UID issues
Jwaifell & Gasaymeh (2023)	Blackboard Learn Ultra	Usability evaluation for students and instructors	Reported usability challenges, particularly in navigation and feedback	Reinforces need for intuitive LMS interfaces
Kang & Lee (2024)	Moodle, Blackboard, Google Classroom	Mobile LMS usability comparison	Found that simplicity and mobile accessibility improve user satisfaction	Shows how mobile-friendly UID influences acceptance
Yusoff (2025)	Malaysian private HLIs	UID impact on eLearning usage by academic lecturers	Identified issues on inconsistent layouts, excessive text, complex navigation	Proposed UID guidelines for adoption of academic lecturers in private HLIs

The literature highlights the need for standardized UID guidelines that not only address usability and functionality but also incorporate the contextual requirements of Malaysian higher education. Thus, by synthesizing insights from perspectives of global LMS usability studies with localized challenges, the study seeks to propose UID guidelines that promote efficiency, accessibility, and better engagement by academic lecturers.

Academic Lecturers' Acceptance of UID in eLearning Platforms

Academic lecturers' willingness to use eLearning platforms is strongly tied to the perceived usability and UID. Previous studies have highlighted that while universities' support and

training are important, the academic lecturers often evaluate eLearning systems based on how intuitive and efficient the UID is for tasks that are related to teaching and learning (Mujalli et al., 2022). Academic lecturers may resist using eLearning platforms if they present excessive textual content or complicated navigation structures, thus resulting in increased cognitive load and reduced efficiency in teaching (Miya & Govender, 2022). Thus, having a more intuitive and visually coherent UID reduces the perceived effort required and enhances academic lecturers' willingness to adopt eLearning systems.

Apart from that, research shows that both academic lecturers and students favour a simpler and interactive interfaces that support quick task completion and improve satisfaction levels (Senevirathne & Manathunga, 2021). When an interface is displayed with overly complex or poorly organized elements, lecturers may perceive the system as cumbersome and reduce their inclination to trust and repeatedly use the platform. Furthermore, academic lecturers' acceptance is not only influenced by the technical usability but also by the belief that the system can support teaching and learning practices. In the Malaysian context, Toh et al. (2023) found that acceptance of technology among academic lecturers is shaped by perceived usefulness, effort expectancy, and contextual factors such as workload and resource availability. This aligns with the UTAUT model, where behavioural intention is mediated by both performance expectancy and facilitating conditions.

A study by Korsah (2024) presented a study on Moodle adoption during emergency remote teaching in Ghana. The study found that social influence, streamlined interfaces, and sufficient technical support were key determinants in academic lecturers' behavioural intention to use the eLearning platform. Moreover, the usage of eLearning systems by academic lecturers is also linked to their trust in the platform's stability and ability to enhance teaching and learning processes. If the UID of eLearning platforms is displayed through structured layouts, accessible functions, and responsive interactivity, the academic lecturers are more likely to integrate the eLearning tools consistently (Zheng et al., 2025). Therefore, the literature highlights that UID quality, through improved usability, clarity, and support, will directly affect academic lecturers' consistent use of the platform.

Research Methodology

This study adopted a mixed-methods approach by integrating both quantitative and qualitative strategies in order to gain a comprehensive understanding of UID in eLearning among academic lecturers in Malaysian private HLIs. The combination of both methods was essential in capturing measurable patterns and nuanced insights regarding the experiences and challenges of academic lecturers in using eLearning platforms. The quantitative phase involved survey questionnaires distributed to academic lecturers across selected private HLIs in Malaysia. The survey items were developed based on prior validated instruments and aligned with constructs based on the UTAUT model. Quantitative methods provided generalizable patterns and highlighted key factors influencing academic lecturers' acceptance of UID (Creswell & Creswell, 2022). Thus, this method enabled the collection of measurable data on usability, functionality, and the overall acceptance of UID by academic lecturers in eLearning platforms. During the qualitative phase, the approach consisted of indirect observations and semi-structured interviews. The interviews allowed the participants to articulate perceptions and experiences of eLearning UID. Meanwhile, observations provided contextual insights into actual system interaction and challenges. These methods enhanced

the survey results by highlighting nuances that were difficult to convey through numerical data (Venkatesh et al., 2022).

A total of 200 lecturers were selected through random sampling across four private HLIs in Malaysia. The sample size represented a diverse range of academic disciplines and provided statistical reliability for quantitative analysis. For the qualitative phase, purposive sampling was employed to include academic lecturers with varied levels of eLearning experience, thereby ensuring a balanced representation.

Data Analysis

In this study, the quantitative data were analysed by using descriptive and inferential statistics. The statistics were used to identify trends, correlations, and significant predictors of experiences. Meanwhile, for qualitative data, thematic analysis was applied to identify recurring themes related to usability, navigation design, and user satisfaction. Therefore, by triangulating both data, the study ensures validity and reliability while addressing the research objectives holistically. Furthermore, before data collection, all participants were informed about the purpose of the study, and consent was obtained before their participation.

The data analysis procedures applied in this study are summarized in Table 2, which combines quantitative statistical analysis with qualitative thematic techniques to provide comprehensive insights into academic lecturers' experiences of UID in eLearning platforms.

Table 2
Phases of Data Analysis

Data Collection	Purpose	Technique of Analysis
Survey questionnaires to 200 academic lecturers of selected private HLIs	To capture academic lecturers' experiences and perceptions of usability, functionality, and engagement in eLearning platforms	Descriptive statistics (mean, frequency, SD) and inferential analysis (correlations, regressions)
Semi-structured interviews	To explore academic lecturers' experiences in interacting with eLearning platforms and expectations for UID improvements	Thematic analysis (coding, categorization, and theme development)
Indirect observation on eLearning platforms of selected private HLIs	To record academic lecturers' real-time experiences and challenges in navigating eLearning interfaces	Descriptive field notes analyzed thematically to identify recurring usability and navigation issues
Triangulation	To synthesize academic lecturers' experiences from survey, interview, and observation findings for validity	Cross-data comparison and integration of patterns

Findings and Discussions

The results from the survey of 200 academic lecturers revealed persistent usability barriers in existing eLearning platforms. More than half of the respondents identified inconsistencies in

navigation and layout structure, as well as text overload, as significant obstacles to the eLearning platform. The functions of advanced tools, such as forums and collaboration tools, were not fully utilized by academic lecturers as regular tools. Moreover, insufficient training or guidance to optimize system use was also highlighted by academic lecturers based on their experiences with eLearning platforms. The findings demonstrate that academic lecturers' experiences are shaped more by UID quality than by system availability, thereby supporting Miya and Govender's (2022) study, which highlighted that poor UID limits user engagement. Similarly, Abid et al. (2024) highlighted disparities in LMS usability, echoing the limited uptake of advanced features observed in this study.

Meanwhile, the results from qualitative interviews and observations reinforced these findings. Frequently, academic lecturers described the UID as cluttered and time-consuming, with excessive reliance on text that discourages active engagement between users and the platform. Training provided to the academic lecturers was often minimal, thus leaving many lecturers reluctant to explore the available features in the eLearning platform. Findings also revealed that the participants consistently emphasized the need for structured, intuitive, and visually more apparent platforms that align and improve teaching and learning workflows. These findings align with the study by Faudzi et al. (2023), who noted that reducing cognitive load would foster deeper engagement by users. Thus, these results underscore the urgency of UID guidelines that prioritize usability, readability, interactivity, and accessibility.

Based on the findings, a contextual UID framework was developed for this study. It consists of five core components that reflect academic lecturers' primary interactions with eLearning systems. The core components are :

- Course Management: Intuitive dashboards and persistent navigation for organizing courses, announcements, and schedules.
- Content Delivery: Structured layouts, consistent placement of menus, and clear hierarchy for teaching and learning resources.
- Assessment and Grading: Integrated assignment creation, submission tracking, and grading interfaces with automated indicators.
- Student Monitoring: Tools to track engagement and performance that include submission progress and participation logs.
- Communication Tools: Streamlined announcements, discussion spaces, and messaging systems for effective communication.

The components are supported by design principles in layout and navigation, typography, colour schemes, and interactivity, which form a holistic approach to UI that enhances academic lecturers' teaching and learning experiences.

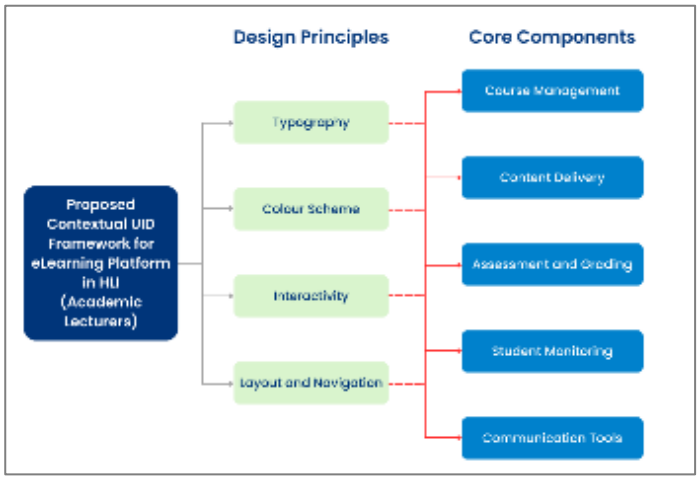

Figure 1: Proposed Contextual UID Framework for eLearning Platforms

The proposed UID framework (Figure 1) for the practical application was demonstrated through a series of design mock-ups that reflected the five core components: course management, content delivery, assessment and grading, student monitoring, and communication tools. These designs emphasize improvements specifically in navigation, layout consistency, and visual hierarchy, while reducing textual overload and complexity. For example, the login and dashboard views illustrate how centralized navigation and persistent sidebars can streamline course management. Meanwhile, the course materials section highlights structured delivery that enhances readability and reduces cognitive load. Similarly, the UID for the assignment page, including submission and grading, showcases a seamless assessment workflow through the support of color-coded indicators for clarity and efficiency. The student monitoring page is facilitated through features that track participation, status, and progress of submissions, enabling timely intervention. Moreover, communication tools such as announcements and academic lecturers' profile pages demonstrate how these tools can be designed to provide accessible, clear, and consistently shared information. Collectively, the mock-ups (as shown in Figures 2, 3, and 4) demonstrate how the proposed framework can be operationalized into a practical UID and reinforce the principles of usability, consistency, readability, interactivity, accessibility, and support for academic lecturers in HLIs.

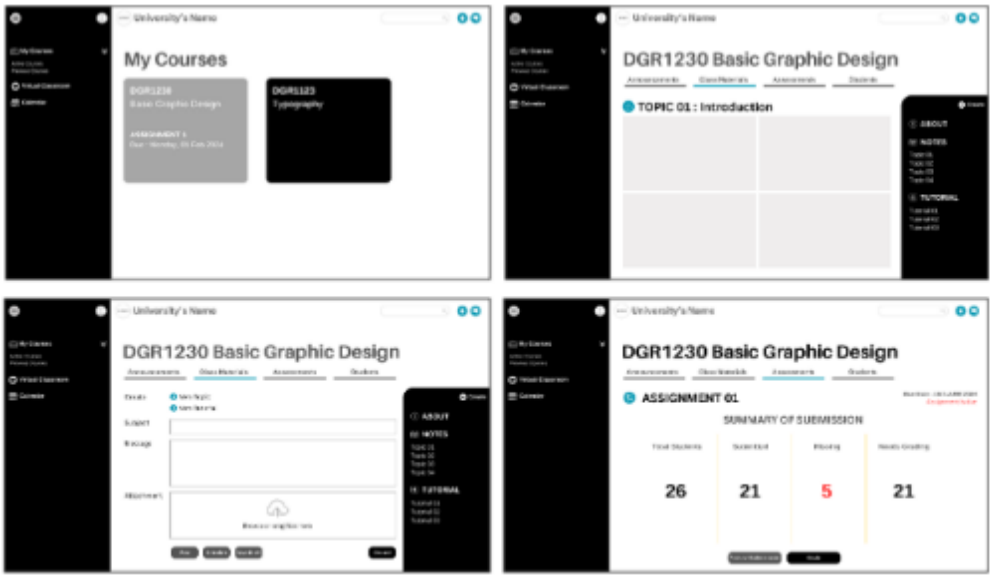

Figure 2: Design Mock-Ups of Course Management and Content Delivery

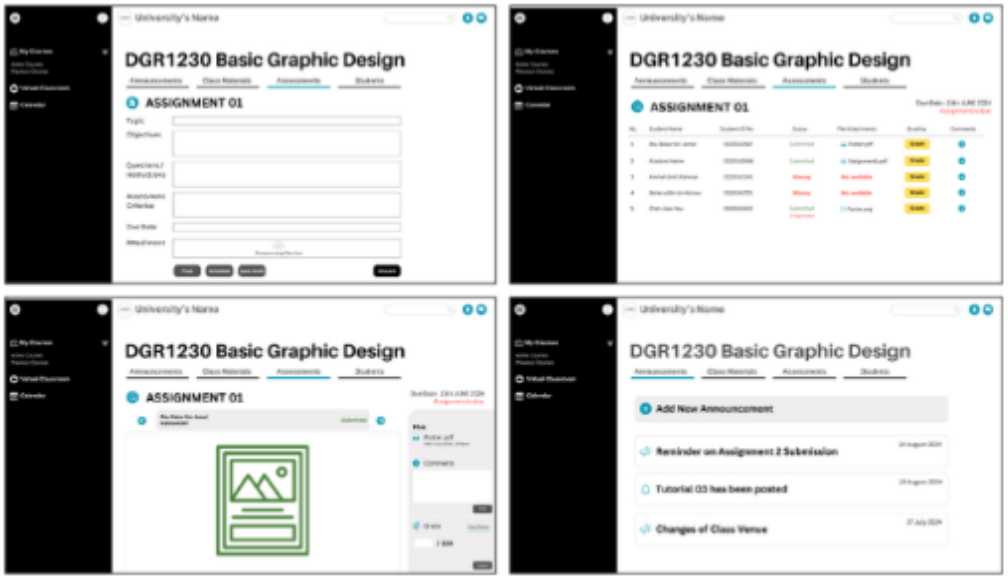

Figure 3: Design Mock-Ups of Assessment and Grading, and Student Monitoring

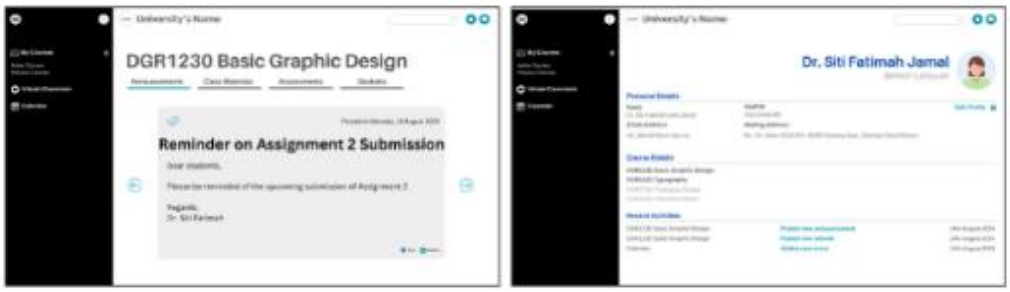

Figure 4: Design Mock-Ups of Communication Tools

The findings have shown that recurring UID challenges, including complex navigation, text-heavy layouts, underutilized features, and limited training support shape academic lecturers' experiences with eLearning platforms. Through the data obtained from surveys, interviews, and observation, it became evident that these issues reduce usability and discourage engagement, thus highlighting the need for a standardized approach to UID. The proposed contextual UID framework addresses the gap by focusing on five core components: course management, content delivery, assessment and grading, student monitoring, and communication tools. Principles of layout, typography, colour, and interactivity supported the core components design mock-ups. The design mock-ups further demonstrated how these guidelines can be translated into practical design features, reinforcing usability, clarity, and inclusivity across eLearning platforms.

Conclusions

This study examined academic lecturers' experiences with eLearning platforms in Malaysian private HLIs, specifically in the focus of the UID's role in shaping usability, functionality, and engagement. The study employs a mixed-methods approach, combining surveys, interviews, and observations. Through the data collected, the findings identified recurring challenges, including inconsistent navigation, text-heavy layouts, underutilization of advanced features, and insufficient training support. Thus, a contextual UID framework was developed, consisting of five core components and supported by design principles. The design mock-ups illustrated

how these guidelines can be embedded in eLearning platforms through UID that are usable, consistent, accessible, and inclusive. These contribute to improving eLearning design in Malaysia's higher education sector, as well as aligning with Education 4.0 and SDG 4 (Quality Education).

Furthermore, the findings carry several implications:

- Theory: The study enriches UID in eLearning by relating academic lecturers' experiences to concrete design principles and contextualizing them within Malaysian HLIs.
- Practical: The framework offers practical guidelines for platform developers, instructional designers, and institutions to enhance interface usability and engagement.
- Policy: Policymakers and higher education administrators can use the framework as a benchmark for evaluating and standardizing eLearning platforms across institutions.

Although the study provides valuable insights, the focus on private HLIs may limit generalizability to public universities. Additionally, the design mock-ups demonstrate potential applications but have not been thoroughly tested in actual teaching environments. Thus, future research could extend this framework to public universities, conduct comparative studies, and test the effectiveness of the proposed guidelines through usability experiments and pilot implementations. Furthermore, expanding the scope to include students' perspectives would also enrich the understanding of UID's impact on the broader teaching-learning ecosystem.

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