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RELATIONSHIP BETWEEN USER INTERFACE DESIGN ON STUDENTS' ONLINE REGISTRATION CHALLENGES AT TARABA STATE POLYTECHNIC, SUNTAI

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ABSTRACT
This study investigates the relationship between user interface design in shaping students' online registration experiences at Taraba State Polytechnic, Suntai, with a focus on usability, technical challenges, digital literacy, and suggested improvements. Digitalization has transformed administrative processes in Nigerian tertiary institutions, yet online registration systems often present usability barriers that hinder task completion and reduce user satisfaction. A descriptive survey design was adopted, targeting 350 students across five schools, with data collected from 332 respondents using a structured questionnaire. Analysis involved descriptive statistics and thematic interpretation of open-ended responses. Findings reveal that students face significant usability challenges, including difficulties navigating the portal, locating information, and understanding instructions, which reduce registration efficiency. Technical and interface design deficiencies, such as slow page loading, system errors, unclear layout, complex navigation, and limited mobile responsiveness, further impede successful registration. Students' digital literacy levels moderated their interactions, with higher skills facilitating smoother registration, while lower skills increased reliance on assistance. Students recommended interface simplification, improved server performance, clearer error messages, and the addition of a help or FAQ section, reflecting strong support for user-centered design improvements. The study concludes that addressing usability, technical, and digital literacy challenges through targeted interface redesign and student training is essential for enhancing registration efficiency, reducing frustration, and promoting equitable access. These findings provide institution-specific insights to inform system upgrades, optimize user experience, and support effective digital transformation in academic administration.

Keywords: Digital literacy, Online registration, Polytechnic students, User interface, Usability, User-centered design

Introduction

Digitalization has increasingly transformed administrative processes in educational institutions worldwide, including admissions, registration, communication, and examination management. Online registration systems are intended to enhance efficiency by enabling students to complete academic procedures remotely and with minimal human intervention (Adeoye, 2021). The success of these systems, however, largely depends on the design and usability of the user interface (UI), which encompasses visual and interactive elements such as buttons, menus, icons, instructional texts, layout arrangements, and feedback mechanisms (Oyetunji and Daniel, 2022). Well-designed interfaces facilitate task completion, reduce errors, and improve user satisfaction, whereas poorly structured interfaces can result in confusion, delays, and repeated mistakes, particularly for users with varying levels of digital literacy.

In Nigerian tertiary institutions, online registration portals are expected to provide clarity, accessibility, and responsiveness. Previous studies have reported widespread usability challenges, including poor navigation, unclear instructions, multi-step processes, ambiguous error messages, slow server response, and limited mobile optimization (Muhammad *et al.*, 2023; Agbo, 2021; Emeng, 2022). While these studies highlight general interface problems, there is limited empirical evidence examining how UI design specifically affects students' registration experiences within individual institutions. In particular, the experiences of students at Taraba State Polytechnic, Suntai, remain underexplored, despite anecdotal reports of difficulties in locating functions, understanding instructions, and completing registration tasks efficiently on both desktop and mobile platforms (Nwosu and Ibrahim, 2023).

Addressing this gap, the present study investigates the role of user interface design in shaping students' online registration experiences at Taraba State Polytechnic. By focusing on students' perceptions of navigation, layout, technical challenges, and recommended improvements, the research provides institution-specific insights that can inform user-centered redesigns, improve system performance, and enhance overall registration efficiency and user satisfaction.

Statement of the Problem

The online registration portal at Taraba State Polytechnic, Suntai was introduced to simplify academic registration and improve service delivery. However, many students continue to face difficulties navigating the system, including complex interface structures, unclear navigation, non-responsive menus, insufficient feedback during errors, and limited mobile compatibility, despite widespread smartphone use. These challenges delay registration, increase dependence on cybercafés and ICT personnel, and may lead to incomplete or incorrect submissions, affecting academic records.

The persistence of these issues suggests that the portal's design does not align with students' digital skills and usability needs. If unaddressed, this could compromise registration efficiency, reduce user satisfaction, and undermine the institution's digital transformation goals. Moreover, there is limited empirical evidence on how user interface design specifically affects students' registration experiences at Taraba State Polytechnic.

This study therefore investigates the role of interface design in shaping students' experiences with the online registration system, aiming to identify usability and technical challenges and provide recommendations for improving system efficiency and user satisfaction.

Objectives of the Study

The main objective of this study is to examine students' experiences with the online registration system at Taraba State Polytechnic, Suntai. The specific objectives are:

1. To evaluate students' perceptions of the usability of the online registration interface.
2. To identify user interface-related challenges that hinder successful registration.
3. To describe students' level of digital literacy in relation to using the registration portal.
4. To gather students' suggestions for improving the usability and functionality of the online registration interface.

Literature Review

Students' Perceptions of Usability of the Online Registration Interface

Usability reflects how effectively students can interact with online registration systems to complete tasks efficiently, accurately, and with minimal frustration (Adeoye and Salami, 2021; Oyetunji and Daniel, 2022). In Nigerian tertiary institutions, students' perceptions of usability influence their confidence, task completion, and willingness to engage with digital platforms. Positive perceptions are associated with clear instructions, logical workflows, readable text, and predictable system responses. Conversely, interfaces perceived as confusing increase cognitive load, errors, and dependence on intermediaries (Muhammad et al., 2023). Evaluating usability provides insight into the alignment between system design and students' digital skills, which is crucial for institutions like Taraba State Polytechnic.

UI-Related Challenges Hindering Successful Registration

UI-related challenges in Nigerian universities often include poorly organized information, inconsistent layouts, inadequate feedback, and limited mobile compatibility (Agbo, 2021; Emeng, 2022). Such issues hinder task completion, increase administrative workload, and reduce equity in access. Overcrowded screens, unclear visual hierarchy, and inconsistent navigation disrupt workflow and may cause students to abandon registration or make errors, undermining the intended efficiency of online systems.

Digital Literacy and Interface Interaction

Digital literacy, defined as students' ability to navigate digital platforms, interpret system messages, and solve basic technical problems, mediates successful registration (Ng and Ibrahim, 2023). Students with low digital literacy struggle even with well-designed systems, leading to incomplete or incorrect registrations. Assessing digital literacy alongside usability distinguishes interface shortcomings from skill gaps, guiding targeted training and support initiatives.

Conceptual Model

This study adopts a user-centered conceptual framework linking interface features (layout, navigation, responsiveness) → perceived usability → UI-related challenges → registration outcomes. Interface design influences usability, which shapes the challenges students encounter, ultimately affecting registration efficiency, task completion, and user satisfaction (Adeoye and Salami, 2021; Nwosu and Ibrahim, 2023). The framework emphasizes that improvements require both technical redesign and support for students' digital literacy.

User-Centered Design Improvements

Applying user-centered design (UCD) principles involves engaging students in evaluating and refining the interface. Suggested improvements include simplifying navigation, optimizing mobile responsiveness, enhancing feedback messages, and providing contextual help (ISO, 2023; Shneiderman et al., 2023). Combining interface redesign with digital literacy support ensures inclusive, efficient, and satisfactory registration experiences.

Review of Empirical Studies

Empirical studies in Nigerian universities consistently indicate that students perceive online registration systems as moderately usable, with clarity of instructions and ease of

navigation enhancing usability, while system downtime and poor feedback reduce satisfaction (Adeyemi and Lawal, 2023; Mensah, Boateng, and Owusu, 2024). Across these studies, perceived usability is closely linked to user confidence and task completion. However, the evidence largely treats usability as a general concept, often ignoring interface-specific features such as layout, menu structures, and responsiveness. Furthermore, while perceptions are documented, few studies examine how these perceptions translate into actual registration outcomes, creating a conceptual gap in understanding the link between usability perception and system effectiveness. The present study addresses this gap by integrating interface-specific usability evaluation with measurable student registration experiences.

Studies identify recurring UI-related challenges, including poor navigation, inconsistent layouts, non-responsive menus, and inadequate error feedback (Okonkwo and Musa, 2023; Chen and Park, 2024). These barriers disrupt workflow, increase errors, and reduce registration success. Although international and local studies highlight these issues, there is limited context-specific evidence on how these UI challenges manifest in Nigerian polytechnic settings, or how they interact with user factors like digital literacy. The present study situates UI challenges within a Nigerian institutional context, emphasizing both prevalence and impact on student outcomes.

Evidence indicates that layout clarity, navigation, and responsiveness significantly influence registration outcomes (Bello, Yusuf, and Adamu, 2024; Kim and Lee, 2025). Effective layout and navigation reduce errors and enhance task completion, while responsive design ensures equitable access across devices. Prior studies, however, often neglect students' subjective usability perceptions and digital literacy as moderators, limiting understanding of how interface features interact with user skills to affect outcomes.

Digital literacy is consistently shown to support effective use of online portals (Adebayo and Salami, 2023; Torres and Mendez, 2024). Students with higher digital skills complete tasks with fewer errors and rely less on external assistance. Yet, most studies do not integrate interface design evaluation, which makes it difficult to discern whether usability issues arise from system flaws or skill deficiencies. The present study addresses this by examining both digital literacy and interface design jointly.

Research demonstrates that applying user-centered design (UCD) principles enhances usability, reduces errors, and improves satisfaction (Ibrahim and Sadiq, 2024; Williams and Carter, 2025). Iterative testing and student involvement in redesign cycles are particularly effective. However, few Nigerian studies combine UCD with empirical evaluation of usability perception and digital literacy, highlighting a conceptual and practical gap. The current study integrates UCD recommendations with measured student experiences to inform actionable improvements.

Research Gap

Overall, the literature shows that usability, UI challenges, interface design features, and digital literacy collectively shape online registration outcomes. Nigerian studies provide foundational evidence but often focus on general usability, omit interface-specific evaluation, or fail to link perceptions to actual registration outcomes. Few studies adopt a conceptual framework linking interface features → usability → challenges → outcomes, and there is limited context-specific evidence for polytechnic students. The present study addresses these gaps by empirically examining interface-specific usability, digital literacy, UI challenges, and suggested improvements at Taraba State Polytechnic, providing a coherent and actionable framework for enhancing registration efficiency.

Methodology

This study adopted a descriptive survey research design, which is suitable for systematically collecting data on students' experiences, perceptions, challenges, and suggestions regarding the online registration interface at Taraba State Polytechnic, Suntai. The design allows for a detailed description of interface usability, UI-related challenges, digital literacy, and student-recommended improvements without making causal or predictive claims, aligning appropriately with the study objectives. The study was conducted at Taraba State Polytechnic, Suntai, located in North-East Nigeria. The institution offers technical, vocational, and entrepreneurial education across multiple campuses, with Suntai serving as the main administrative and academic hub. The polytechnic employs an online registration portal for activities such as course registration, admission clearance, payment of fees, and access to academic records. The demographically diverse student population and widespread use of ICT services make it a relevant context for evaluating user interface usability and digital literacy challenges. The population comprised all registered students in Ordinary Diploma (OD), OD Consultancy Services, and Diploma programmes for the 2024/2025 session, totaling approximately 7,000 students, all of whom interact with the online registration portal.

A stratified random sampling technique was used, grouping students by schools—Engineering, Science, Management, Agriculture, and General Studies—to ensure proportional representation. Using Krejcie and Morgan (1970), a sample of 364 was recommended. For practical purposes, 350 respondents were targeted, ensuring reasonable representativeness while accommodating logistical constraints. Data were collected using a structured questionnaire, User Interface and Online Registration Challenges Questionnaire (UIORCQ), with four sections:

1. Demographics
2. Students' experiences with the interface
3. UI-related challenges
4. Suggested improvements

A 5-point Likert scale (Strongly Agree–Strongly Disagree) was used for quantitative items. Digital literacy was operationalized as the ability to navigate digital interfaces, interpret system feedback, and perform registration tasks independently. Sample items included: "I can complete registration tasks without external help" and "I understand error messages and can correct mistakes." Content validity was ensured through expert review by three academics in Computer Science, Information Systems, and Educational Measurement. Feedback led to refinements in clarity, structure, and item phrasing. A pilot study with 30 students from a similar polytechnic produced a Cronbach's Alpha of 0.84, indicating high internal consistency. Questionnaires were administered physically and electronically via class WhatsApp groups. Respondents had three days to respond, resulting in 332 completed questionnaires (95% response rate).

Data were coded and analyzed using SPSS version 25. Analysis focused on:

1. Descriptive statistics (frequency, mean, standard deviation) for usability, UI challenges, and digital literacy
2. Tables and charts to visualize patterns
3. Cross-tabulations to explore variations in perceptions across demographic categories (not causal relationships)
4. Thematic analysis for open-ended suggestions

This approach aligns strictly with the descriptive nature of the study, avoiding inappropriate causal inference, while providing a clear, evidence-based assessment of UI usability and challenges.

Results

This section presents the findings of the study based on responses from 332 students of Taraba State Polytechnic, Suntai. The results are organized into four main parts:

1. Demographic characteristics of respondents
2. Students' experience with the online registration user interface
3. Challenges encountered during online registration
4. Students' suggested improvements

Demographic Characteristics of Respondents

Table 1: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	188	56.6
Female	144	43.4
Total	**332**	**100**

Source: *Field survey, 2025*

More male students (56.6%) participated in the study compared to females (43.4%), reflecting the general student population distribution in the institution

Table 2: Respondents by School/Faculty

School/Faculty	Frequency	Percentage (%)
Engineering	72	21.7
Science	64	19.3
Management	89	26.8
Agriculture	44	13.3
General Studies	63	18.9
Total	**332**	**100**

Source: *Field survey, 2025*

Students from the School of Management had the highest participation (26.8%), likely due to their larger enrolment.

4.2 Students' Experience with the Online User Interface

Table 4.1: Students' Responses on Ease of Navigating the Interface

Response	Frequency	Percentage (%)
Strongly Agree	46	14
Agree	78	23
Undecided	56	17
Disagree	91	27
Strongly Disagree	61	19
Total	332	100

Source: *Field survey, 2025*

About 46% of students disagreed or strongly disagreed that the interface is easy to navigate, indicating that many students face moderate difficulty with navigation.

Table 4.2: Students' Rating of Interface Layout and Structure

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Layout is well-organized	38	85	69	82	58	332
Information is easy to locate	42	71	63	94	62	332

Source: *Field survey, 2025*

more than 40% of students disagreed or strongly disagreed with statements on layout and information clarity, showing that many students find the interface confusing or poorly organized.

Table 4.3: Technical Challenges During Online Registration

Challenge	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Slow loading pages	128	101	32	39	32	332
System errors during submission	109	120	27	45	31	332
Difficulty accessing portal during peak periods	131	98	29	42	32	332

Source: *Field survey, 2025*

Between 68% and 70% of students agreed or strongly agreed that technical issues occur, indicating these are major barriers to efficient registration.

Table 4.4: Usability Challenges During Online Registration

Challenge	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Too many steps in registration	112	102	33	48	37	332
Lack of clear instructions	98	117	38	41	38	332
Confusing menu options	101	108	47	43	33	332

Source: *Field survey, 2025*

About two-thirds of students agreed or strongly agreed that usability issues hinder successful registration, highlighting the need for interface improvements.

Table 4.5: Students' Suggested Improvements

Improvement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Simplify interface design	139	121	22	28	22	332
Improve server speed	142	118	29	22	21	332
Provide better error messages	131	114	35	28	24	332
Add a help/FAQ section	126	118	36	33	19	332

Source: *Field survey, 2025*

Between 74% and 77% of students agreed or strongly agreed with all suggested improvements, showing strong support for user-centered design changes.

Discussion of Findings

The study concludes that students at Taraba State Polytechnic, Suntai face significant usability challenges with the online registration system, including difficulties navigating the portal, locating information, and understanding instructions, which reduce task efficiency and satisfaction. Technical and interface design deficiencies, such as slow page loading, system errors, poor layout, complex navigation, and limited mobile responsiveness, further hinder successful registration outcomes and negatively affect students' ability to complete tasks independently.

Students' digital literacy levels play a moderating role, with higher digital skills enabling more effective interaction with the system, while lower skills exacerbate challenges and dependence on external assistance. Finally, students' recommendations for simplifying the interface, improving server performance, providing clearer error messages, and adding a help or FAQ section indicate that implementing user-centered design improvements and targeted system enhancements is essential to improve usability, reduce frustration, increase efficiency, and ensure equitable access for all users.

Conclusion

The study concludes that the online registration interface at Taraba State Polytechnic is constrained by a combination of usability, technical, and design challenges, which collectively impede students' ability to complete registration tasks efficiently and accurately. Specifically, poorly organized layouts, complex navigation pathways, unclear instructions, and slow system responsiveness were identified as major barriers, while limited digital literacy among some students further exacerbated these difficulties. These issues not only delay registration but also increase reliance on external assistance, elevate user frustration, and risk errors in academic records. The findings underscore the need for a comprehensive, user-centered approach to system improvement, including interface simplification, enhanced server performance, clear feedback mechanisms, and targeted digital literacy training for students. Addressing these challenges is critical to ensuring that the online registration portal fulfills its intended purpose of streamlining administrative processes, promoting equitable access, and fostering positive user experiences. Ultimately, improving interface design and usability can enhance students' confidence in digital systems, reduce administrative bottlenecks, and support the broader institutional goal of effective and reliable academic service delivery.

Recommendations

In line with the findings, the following are hereby recommended:

1. Students experienced usability challenges with the online registration system, including difficulties navigating the portal, locating information, and understanding instructions, which affected task completion and overall satisfaction.
2. Technical and interface design challenges, such as slow page loading, system errors, poor layout, complex navigation, and limited mobile responsiveness, were found to hinder successful registration outcomes.
3. Students' digital literacy moderated their interaction with the portal, as those with higher digital skills experienced fewer difficulties and greater independence in completing registration tasks.
4. Students recommended simplifying the interface, improving server performance, providing clearer error messages, and adding a help or FAQ section, highlighting the need for user-centered design improvements to enhance efficiency, reduce frustration, and ensure equitable access.

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