

Information System Accessibility Challenges in Higher Education Institution Applications: A Case Study of Tabora Municipal Council, Tanzania

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Abstract

Recently, Tanzania has experienced the emergence of digitization across sectors, including the education sector. The use of digital admission systems in higher education institutions has enhanced service and transparency for applicants. Applicants encounter several difficulties when interacting with admission-related systems. This paper examined the challenges faced by first-year applicants during and after the higher learning institution admissions window opened. Within this context, quantitative and qualitative approaches were utilized, and data were collected from first-year students and continuing students at Tabora Municipal Council. Results showed that limited access to digital devices, low levels of digital literacy, inadequate internet access, and the high cost of internet data (technological, infrastructural, and socio-economic factors) were among the factors that significantly hindered the effective use of these systems, as reported by applicants from rural and low-income backgrounds. Also, the paper provides context-specific evidence for the discourse on digital inclusion and practical recommendations to enhance the accessibility, usability, and inclusiveness of higher learning institutions' application systems in Tanzania.

Keywords

Information Systems, Higher Learning Institutions,
Higher Learning Information Systems, New Applicants

1. Introduction

The deployment of information and communication technologies (ICTs) has fun-

damentally transformed service delivery across a wide range of sectors, with education a prominent example. In Tanzania, institutions of higher learning are increasingly reliant on digital information systems to oversee student applications, admissions, and enrollment processes, aiming to improve efficiency, transparency, and administrative efficiency [1] [2]. Centralized admission platforms have now emerged as the primary access points for new students seeking entry into universities and colleges.

Despite these advancements, the accessibility and effective utilization of digital application systems remain markedly inconsistent. New applicants, particularly those originating from rural areas and economically disadvantaged backgrounds, continue to face significant obstacles related to inadequate internet infrastructure, low levels of digital literacy, high data costs, and a lack of sufficient technical support [3] [4]. These limitations often result in delays, errors, or the failure to submit applications, thus obstructing equitable access to higher education. Although previous investigations have examined the adoption of ICT in higher education, there exists a scarcity of empirical studies focusing on the experiences of first-time applicants during the application phase, particularly within semi-rural local government contexts. Existing literature predominantly concentrates on institutional implementation rather than the challenges faced at the user level, thereby creating a significant gap in understanding how socio-economic, technological, and infrastructural variables influence system effectiveness during the initial access phase [5] [6]. The digital transformation of admissions systems in Tanzanian colleges and universities has provided relief to applicants and increased transparency. Nonetheless, numerous first-year students at these institutions have yet to fully engage with this system due to substantial challenges in navigating information systems. This paper aims to explore the digital obstacles that new student's college encounter when applying to higher learning institutions in the Tabora Municipal Council, employing a detailed case study approach. To effectively reverse this trend and attract a new cohort of students, it is imperative to first comprehend their perceptions regarding access to information. This research project is predicated on the premise that it investigates the experiences of new applicants, elucidates the key factors that influence the effectiveness of application information systems, and proposes a set of strategies to enhance information access, system utilization, and equity. The findings furnish essential country-specific evidence for higher education planners, system developers, and educators striving to create a more equitable landscape for university education, utilizing a combination of quantitative and qualitative research methodologies, including structured questionnaires.

2. Related Work

This section conducts a comprehensive examination of scholarly literature pertaining to the integration and utilization of digital information systems within the context of higher education application processes, with a specific emphasis on

digital inclusion and the obstacles encountered by prospective students.

2.1. Information Systems in Higher Learning Institution Applications

Information systems are fundamental to managing student admissions while increasing operational efficiency, transparency, and accessibility in higher education institutions (HEIs) [7]. Worldwide, online admission systems have increasingly replaced manual procedures, thereby lowering administrative costs and processing times while improving data accuracy and service quality [8]. In Tanzania, digital admission platforms coordinated by the Tanzania Commission for Universities (TCU) for universities and the National Council for Technical and Vocational Education and Training (NACTVET) for technical and vocational institutions have become crucial for widening participation in higher education and technical education in response to rising student demand. Applicants submit their applications through institutions' online admission systems in line with the admission guidelines issued by TCU and NACTVET. Nevertheless, the effectiveness of these systems is still limited by insufficient digital infrastructure, inadequate digital literacy, and unequal access to information and communication technology (ICT) resources, especially for students in semi-urban and rural areas [9].

2.2. Digital Divide and Access to Higher Education

The digital divide shows differences in access to digital technologies, digital skills, internet connectivity, and the results that follow from their use [10]. It offers a useful conceptual lens for analyzing differences in how digital tools are applied. In Tanzania, empirical findings show that shortcomings in digital literacy support, restricted ICT infrastructure, and limited institutional capacity reduce students' ability to use digital technologies effectively in higher education [9]. Comparable problems have also been observed throughout East Africa. In Kenya, notable differences in digital access and competencies are evident among university students, especially across institutions and socio-economic groups [11]. Similarly, research in Uganda indicates that weak internet connectivity, high data costs, and insufficient ICT skills continue to be major obstacles to students' involvement in online learning [12]. Taken together, these results imply that socio-economic and geographic inequalities still hinder fair access to digital higher education services across East Africa.

2.3. Usability and User Experience of Application Systems

System usability is a key factor in whether information systems are successfully adopted and consistently used. Human-computer interaction research shows that user-friendly interfaces, intuitive navigation, and clear guidance improve system acceptance and user satisfaction [13]. Evidence from East Africa further suggests that students' perceived ease of use of digital systems strongly affects their acceptance and ongoing use, whereas poor interface design and insufficient user

support lower system utilization [3]. Likewise, research in Tanzania highlights usability problems such as complex interfaces, inadequate navigation, insufficient user support, and limited guidance as major obstacles to effective use of digital systems, especially for first-time users with limited digital competencies [14].

2.4. Socio-Economic Factors and Digital Literacy

Socio-economic factors such as household income, educational history, and social support substantially shape students' capacity to interact with digital systems. Digital literacy, understood as the capacity to access, appraise, and effectively use digital technologies, is central to strengthening students' confidence and achievement when managing online application procedures. Research indicates that greater digital literacy enhances users' motivation and capability to use digital technologies in higher education settings [15]. In Tanzania, low levels of digital literacy among secondary school graduates remain a continuing concern, frequently making it necessary for applicants to rely on support from family members, teachers, or cybercafé staff during the higher education application process [16] [17]. Moreover, recent studies across East Africa suggest that digital literacy programs can enhance individuals' capacity to access and use digital technologies effectively, strengthening digital inclusion and lowering barriers to participation in digital services [18].

The reviewed literature suggests that, although digital information systems have significantly increased the efficiency and transparency of higher education application processes, ongoing barriers linked to the digital divide, system usability, and socio-economic disparities continue to limit equitable access, especially in developing countries [10] [19]. Prior studies in Tanzania and the wider East African region have largely emphasized national or institutional viewpoints, with comparatively little empirical attention given to the local realities of prospective applicants, particularly those living in semi-urban areas [3]. In addition, existing studies often treat digital access, system usability, and digital literacy as separate concerns, which limits a complete understanding of the interrelated difficulties encountered by first-time applicants. To close these gaps, this study examines how digital barriers, constraints in system usability, and socio-economic factors jointly affect first-time applicants in Tabora Municipal Council. By supplying context-specific empirical insights, the study strengthens the current knowledge base and provides actionable guidance for creating more inclusive, user-centred higher education application systems in Tanzania. This investigation is underpinned by the Digital Divide Theory and the Technology Acceptance Model (TAM). The Digital Divide Theory explains the disparities in access to digital technologies and competencies that stem from socio-economic and geographic factors, thereby supporting the aim of investigating barriers to equitable access to higher education application systems [10]. The Technology Acceptance Model elucidates the utilization of systems based on perceived utility and perceived ease of use, aligning with the evaluation of the usability and user experience of digital application platforms [13].

The theoretical frameworks are operationalized by converting their principal concepts into quantifiable study variables. The Digital Divide Theory is employed by analyzing disparities in access to devices, internet connectivity, affordability, geographic location, and digital skills, which collectively signify barriers to equitable utilization of higher education application systems. The Technology Acceptance Model (TAM) is operationalized by assessing applicants' perceived usefulness (e.g., efficiency, transparency, time, and cost savings) and perceived ease of use (e.g., clarity, navigation, language, and system complexity). Collectively, these frameworks interlink access-related constraints with user perceptions to explain the processes of system adoption and use.

The Digital Divide Theory and the Technology Acceptance Model (TAM) informed the design of questionnaire items and interview questions by shaping how access-related obstacles such as device availability, internet connectivity, affordability, and digital skills were evaluated, alongside users' perceptions of system usefulness, ease of use, and acceptance of the online application system.

3. Methodology

This study was conducted in Tabora Municipal Council, Tanzania. A descriptive research design was employed, integrating both quantitative and qualitative approaches, with greater emphasis placed on the quantitative component. The design was appropriate as the study sought to examine the challenges encountered by new students applying to Higher Learning Institutions (HLIs) in Tanzania through information systems. This study focused on first-year and continuing students enrolled in institutions of higher learning who had successfully applied for admission via the Higher Education Institution (HEI) online application system. These students were chosen because they had direct experience with the online admissions process, enabling them to offer credible information regarding the digital difficulties encountered during the application period. To be considered eligible for participation, respondents had to satisfy the following inclusion criteria: Be enrolled as a registered first-year or continuing student in an institution of higher learning. Have completed and submitted an application through the HEI online admission system. Agree to take part in the study by providing informed consent. A total of 111 respondents were selected using purposive and convenience sampling techniques. The sample included 55 Form Four, 44 Form Six, and 12 diploma applicants.

3.1. Data Collection

Data were collected from both primary and secondary sources. Primary data came from 111 respondents: 100 participants completed structured questionnaires, and 11 participants took part in semi-structured interviews. The respondents were Form Four, Form Six, and diploma applicants with experience using the HEI online application system. The semi-structured interviews involved purposively selected respondents to complement questionnaire findings and yield deeper in-

sight into their experiences. These qualitative interviews examined key themes, including internet connectivity, internet affordability, digital literacy, access to digital devices, technical support, and recommendations for enhancing the effectiveness and inclusiveness of the online application process. Secondary data were obtained by reviewing relevant journals, textbooks, government documents, institutional publications, and reputable online sources to provide contextual and theoretical support for the study. **Figure 1** demonstrates the summary of the respondents who were utilized in this study, experienced and non-experienced with the online administration systems.

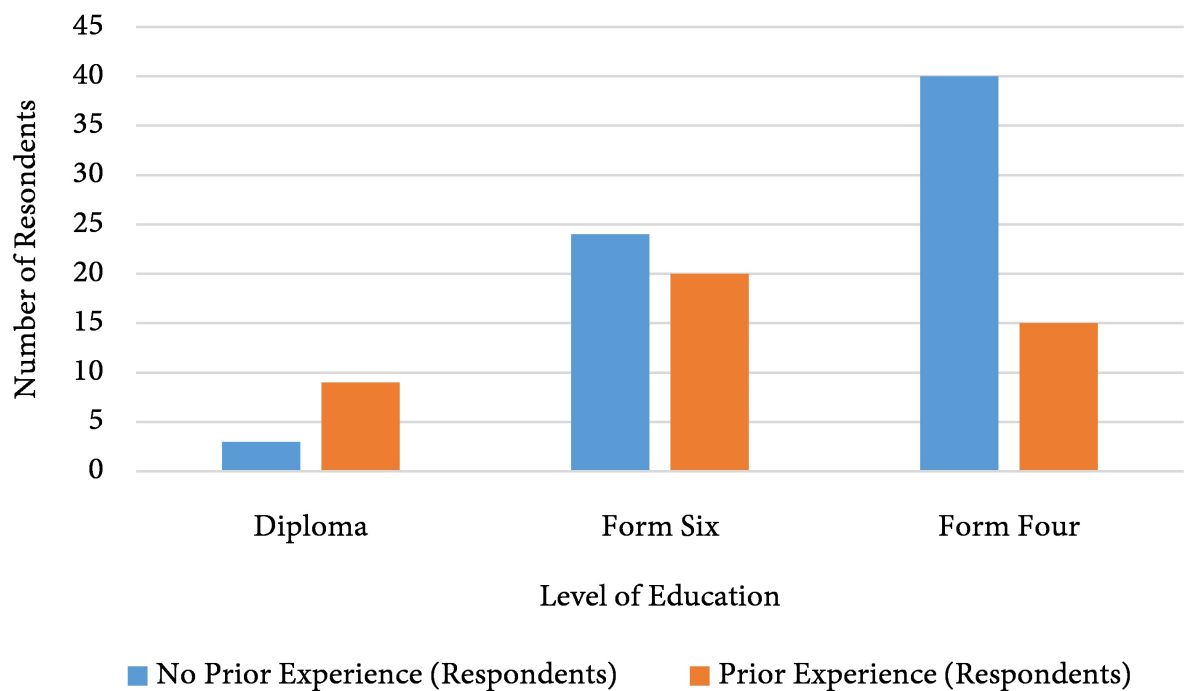


Figure 1. Summary of respondents.

3.2. Analysis

Quantitative data were analyzed using descriptive statistics and presented in tables generated through SPSS. Qualitative data were analyzed using thematic analysis and reported narratively to complement the quantitative findings. To ensure the validity and reliability of the research instruments, a pilot study was conducted among a small group of students at Tanzania Public Service College (TPSC), Tabora Campus. Feedback from the pilot informed refinement of the instruments before the main data collection. Ethical considerations were strictly observed. Permission was obtained from relevant authorities, and informed consent was secured from all participants. Confidentiality and anonymity of respondents were maintained throughout the study.

The demographic characteristics of the 111 respondents in **Table 1** show that the majority were aged 19 - 35 years (63.1%), with smaller groups aged 15 - 18 years (33.3%) and ≥ 36 years (3.6%). A significant gender imbalance was observed,

with females comprising 77.5%. Nearly half of the respondents completed Form Four (49.5%), followed by those with Form Six (39.6%) and Diploma holders (10.8%). The sample mainly consisted of young adults with secondary education, influencing their viewpoints and participation. The gender disparity must be acknowledged when analyzing gender-related results and the applicability of the findings. Contextualize the interpretation of the study's findings and their broader applicability.

Table 1. Diversity of respondents.

Variable	Category	Respondents (n)	Percentage (%)
Age Group	15 - 18 years	37	33.3
	19 - 35 years	70	63.1
	35 years and above	4	3.6
Gender	Female	86	77.5
	Male	25	22.5
Level of Education Completed Before Applying	Form Four	55	49.5
	Form Six	44	39.6
	Diploma	12	10.8

4. Findings and Discussion

This section presents the findings of a study conducted in the Tabora Municipal Council on the challenges faced by new students applying to Higher Learning Institutions in Tanzania. The subsequent subsections present the results in relation to the study objectives.

4.1. Digital Barriers Faced by New Students

Digital barriers refer to the difficulties reported by respondents in accessing, using, and completing the online application process. In this study, digital barriers were operationalized using respondents' experiences with internet connectivity, internet costs, digital skills, access to devices, and the availability of technical support.

The findings indicate that a majority of respondents (63.1%) accessed application systems using personal digital devices, as shown in **Table 2**, demonstrating substantial reliance on mobile technologies in the application process. Nevertheless, the use of shared devices (9.0%), internet cafés (26.1%), and others (3.6%) points to disparities in access to digital resources. This finding reflects the continuing digital divide across Tanzanian higher education institutions; differences in access to digital technologies, internet connectivity, affordability, and digital literacy still place students from low-income households at a disadvantage, which in turn constrains their meaningful participation in digital learning and online academic services [17].

Table 2. Devices used to access the application system.

Device Category	Frequency (n)	Percentage (%)
Personal device	70	63.1%
Shared device	10	9.0%
Internet café	29	26.1%
Other	4	3.6%
Total	111	100%

Poor internet connectivity emerged as the most frequently reported challenge (40.0%), as depicted in **Table 3**, largely attributable to inadequate ICT infrastructure and unstable network coverage, especially outside major urban centers. High internet data costs (22.5%) further constrained system utilization, as most applicants relied on prepaid mobile data, thereby increasing the financial burden of completing online applications. These findings are consistent with prior studies identifying infrastructure limitations and affordability constraints as significant barriers to digital service access in Tanzania [1].

Table 3. Barriers encountered by the respondents.

Challenge	Number of Respondents (n)	Percentage (%)
Poor internet connectivity	45	40.5
Lack of digital skills	28	25.2
High cost of internet/data	25	22.5
Language difficulties	19	17.1
Complicated system interface	12	10.8
Lack of technical support	8	7.2
Limited access to devices	7	6.3
Others	7	6.3

System usability challenges were also evident. Complicated interfaces (10.8%) and limited technical support (7.2%) suggest that application platforms are not sufficiently designed to accommodate first-time users with varying levels of digital competence. Existing literature similarly observes that weak system design and inadequate user support reduce the effectiveness of e-education and e-government platforms in developing countries.

25.2% of respondents reported limited digital skills, particularly among Form Four applicants, indicating insufficient exposure to ICT at lower levels of education. This finding aligns with research demonstrating that inadequate ICT training adversely affects students' ability to effectively utilize online application systems.

4.2. Impact of Technological, Infrastructural, and Socio-Economic Factors

The study, as shown in **Table 4**, illustrates that technological, infrastructural, and socio-economic elements significantly hindered students' access to higher learning institutions' application systems. While 30.2% of respondents reported consistent internet access, the majority (63.2%) described it as sometimes reliable, and 6.6% faced rare or unreliable connectivity, indicating ongoing infrastructural challenges [3].

Financial obstacles were significant, with 66.7% noting that internet or digital device costs affected their application processes, including 38.7% citing moderate effects and 18.0% strong effects. Digital literacy was identified as a key limitation, as 69.3% experienced moderate to severe impacts, and 88.3% recognized that inadequate skills hindered their ability to navigate the system independently.

To address these issues, applicants predominantly depended on informal support networks, especially family members ($\approx 40\%$), followed by friends, educators, and ICT personnel. Overall, the findings suggest that infrastructural deficiencies, financial limitations, and inadequate digital skills converge to create complex barriers to equitable access.

Table 4. Factors affecting students' access to higher learning institution application systems (N = 111).

Variable	Category/Response	Number of Respondents (n)	Percentage (%)
Internet Reliability	Unreliable	2	1.9
	Rarely reliable	5	4.7
	Sometimes reliable	67	63.2
	Always reliable	32	30.2
Effect of Internet/Device Costs	No effect	37	33.3
	Small effect	11	9.9
	Moderate effect	43	38.7
	Strong effect	20	18.0
Impact of Digital Literacy	No impact	13	11.7
	Small extent	21	18.9
	Moderate extent	54	48.6
	Great extent	23	20.7
Source of Assistance	Family members	44	39.6
	Friends	25	22.5
	Teachers	20	18.0
	ICT staff	15	13.5
	Other	4	3.6

4.3. Effectiveness and Inclusiveness of the Application System

Effectiveness and inclusiveness describe how far the online application system of a higher education institution allows students to complete the admission process efficiently, accurately, and fairly. These concepts were assessed based on respondents' perceptions of system usability, reliability, ease of use, accessibility, internet affordability, the availability of support services, and their capacity to participate despite digital constraints.

The majority of participants regarded the system as inclusive, with 45.0% rating it moderately and 42.3% as very inclusive. Conversely, 9.9% described it as slightly inclusive, and 5.4% viewed it as not inclusive as shown in **Table 5**. Overall, the findings suggest that most respondents hold a positive view of the current higher education application system's inclusiveness, despite a minority expressing less favorable opinions.

Table 5. Perceived inclusiveness of the current higher education institution application system (N = 111).

Inclusiveness Level	Number of Respondents (n)	Percentage (%)
Very inclusive	47	42.3
Moderately inclusive	50	45.0
Slightly inclusive	11	9.9
Not inclusive	6	5.4

4.4. Proposed Strategies for Improvement

Table 6. Respondents' recommendations for improving higher learning institution application system.

Recommended Improvement Measure	Frequency (n)	Percentage (%)
Improving internet affordability	43	38.7
Provision of clear guidelines and user tutorials	32	28.8
Simplification of system interfaces	19	17.1
Establishment of help desks or application support centers	22	19.8
Multilingual system support	3	2.7
Other suggestions	2	1.8
Total	111	100

The data derived from the participants illustrates substantial endorsement for a variety of enhancement methodologies. Specifically, 43 participants (38.7%) ardently advocated for the enhancement of internet affordability. Moreover, 32 participants (28.8%) accentuated the necessity for explicit guidelines and instructional tutorials to assist applicants throughout the application procedure. The

simplification of system interfaces was suggested by 19 participants (17.1%), whereas 22 participants underscored the significance of establishing help desks or application support centers to furnish prompt assistance, as delineated in **Table 6**.

In addition, training and orientation sessions for prospective applicants received considerable support, highlighting the imperative for capacity-building initiatives alongside technological advancements. A lesser segment of participants (3 participants, 2.7%) proposed the implementation of multilingual system support, while alternative recommendations constituted 1.8% of the collected responses.

5. Conclusions and Recommendations

5.1. Conclusions

This study examined the challenges new students encounter when using digital systems for higher education in Tanzania, with a focus on Tabora Municipal Council. Overall, the results suggest that digital application systems enhance the efficiency and transparency of admissions, but their impact is limited by weak internet connectivity, high internet costs, restricted access to digital devices, insufficient digital literacy, and usability problems within the systems. These findings align with recent research indicating that digital literacy and supportive digital environments strongly affect students' effective use of digital systems in higher learning institutions [17] and with the Digital Divide Theory [10].

The study further found that many applicants seek help from family members, teachers, peers, and cybercafé operators, underscoring the role of social support in reducing digital barriers. To advance equitable access, policymakers and higher education institutions should strengthen digital infrastructure, reduce internet affordability constraints, strengthen digital literacy, streamline application systems, and implement inclusive, user-centred designs that meet applicants' varied needs.

These findings should be considered alongside several limitations. The study took place in a single municipal council and used non-probability sampling, which may restrict the generalizability of the results. In addition, gender imbalance among respondents may have affected the findings. Future research should use probability sampling, recruit participants from multiple regions, and evaluate the effectiveness of interventions designed to improve digital inclusion and access to higher education application systems.

5.2. Recommendations

Based on the study's findings, it is recommended that the Government and relevant stakeholders enhance internet affordability and reliability, particularly in rural and economically disadvantaged regions, to promote equitable access to higher education application systems. Higher education institutions and system developers should streamline application interfaces and provide clear guidelines and user tutorials to assist first-time applicants. Additionally, targeted digital literacy train-

ing should be provided to prospective students, especially those completing Form Four and Form Six, to enhance their ability to effectively use online application systems. Establishing well-resourced help desks or application support centers at the institutional and municipal levels is also advised to deliver timely technical assistance. Furthermore, application systems should incorporate multilingual support and accessibility features to accommodate applicants with diverse linguistic backgrounds and disabilities. Continuous system monitoring and user feedback mechanisms should be strengthened to sustain improvements in system effectiveness and inclusiveness.

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Conflicts of Interest

The author declare no conflicts of interest regarding the publication of this paper.

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