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EMPIRICAL PAPER

Assessment of the Availability and Usability of Teaching and Learning Materials and Resources in Higher Education Institutions for Graduates' Employability Skills Development

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Abstract

Purpose: This study examined the availability and usability of teaching and learning materials and resources in Nigerian higher education institutions and assessed their adequacy in supporting graduates' employability skills development for the twenty-first-century labour market.

Methodology: A non-experimental descriptive survey design was adopted. Using a multistage sampling procedure, 1,109 graduates were drawn from 80 federal, state, and private higher education institutions across Nigeria. Data were collected using the Teaching and Learning Materials and Resources Inventory (TLMRI), which demonstrated high reliability (r = 0.93). Descriptive statistics were used to analyse the levels of resource availability and usability.

Results: Findings showed a relatively high level of resource availability (67.9%), indicating adequate provision of core instructional facilities such as lecture halls, textbooks, and computers. However, resource usability was only moderate (52.4%), suggesting that many available resources were underutilised, outdated, or poorly maintained. Digital, collaborative, and psychosocial resources recorded particularly low usability levels, limiting their contribution to employability skills development.

Novelty and Contribution: The study advances an Input→Process→Outcome framework in which resource availability is the input, usability is the mediating process, and graduates' employability is the outcome. By positioning usability as a mediating mechanism between resources and employability outcomes, the study extends existing literature beyond resource provision.

Practical and Social Implications: Improving the usability of teaching and learning resources can enhance experiential learning, reduce gaps in graduate skills, and support the production of innovative, workforce-ready graduates, with implications for institutional effectiveness, national competitiveness, and sustainable development in Nigeria's higher education system.

Keywords: Higher education, Resource availability and usability, Graduates' employability, Skill development

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1 Introduction

The twenty-first-century labour market increasingly demands graduates who are not only knowledgeable but also adaptable, innovative, and able to apply their skills effectively in dynamic work environments. Consequently, graduate employability has become a key performance indicator for higher education institutions worldwide, reflecting their capacity to prepare students for meaningful participation in the workforce and contribution to national competitiveness. Research by Crebert, Bates, Bell, Patrick, and Cragnolini (2004) and Andrews and Higson (2008) has emphasised that graduate employability is closely linked to curriculum design, pedagogical strategies, and the development of generic and transferable skills. While these studies provide valuable insights into how employability skills can be fostered through teaching approaches and curricular structures, they largely focus on what should be taught and how it should be taught, with limited attention to the institutional resource conditions that support these processes. Yet, teaching and learning do not occur in isolation from material, digital, and human resources. Facilities such as libraries, laboratories, internet connectivity, virtual learning environments, and academic support personnel play a critical role in shaping learning experiences and opportunities for skill acquisition (Raheef, 2024; Cambridge University Press and Cambridge Assessment, 2020).

Despite this recognition, existing literature has not sufficiently examined whether teaching and learning materials and resources are actually available in higher education institutions, nor whether those that are available are usable, functional, and effectively integrated into teaching and learning processes. In many cases, the presence of resources is implicitly assumed, without empirical distinction between availability and usability. As a result, there is limited empirical evidence on how the interaction between resource availability and usability influences the development of graduates' employability skills across diverse higher education institutions. This study addresses this gap by systematically examining the availability and usability of teaching and learning materials and resources in higher education institutions and analysing how these dimensions relate to the development of graduates' employability skills. By adopting an Input–Process–Outcome (IPO) framework, the study provides an evaluative perspective that links institutional resource provision (input) and utilisation (process) to graduates' employability (outcomes), thereby contributing to a more comprehensive understanding of the institutional factors underpinning graduate employability.

The availability of teaching and learning resources in higher education institutions refers to the extent to which physical, digital, and human resources are sufficiently provided to support academic and professional development. These include material resources such as lecture rooms, laboratories, libraries, internet facilities, and electricity, as well as human resources such as lecturers, counsellors, and laboratory technicians. The adequacy of these resources directly affects institutions' ability to deliver quality education and prepare graduates for the labour market. Research consistently highlights that inadequate resource provision undermines the effectiveness of teaching and learning, as demonstrated by Ogunode, Jegede, and Musa (2021). Similarly, Ayoko, Peter and Jegede (2021) note that overcrowded lecture rooms, outdated laboratory facilities, and poor library infrastructure in Nigerian universities limit students' ability to engage in active learning. Likewise, insufficient teaching and learning resources in Ghanaian schools negatively affected learning outcomes (Partey, Annim, Yidana, and Sebu, 2024; Saayir and Pufaa, 2021). At a global level, Raheef (2024) stresses that resource availability is a key driver of skills development, as students cannot meaningfully acquire digital literacy, problem-solving, or teamwork skills without adequate facilities and technological tools.

Human resource availability is equally critical. According to Knight and Yorke (2003), access to qualified and motivated lecturers and support staff enhances opportunities for mentoring, collaboration, and experiential learning. When institutions are understaffed, students often miss out on personalised guidance, limiting their ability to develop employability skills such as communication and leadership. Adeleke and Olorunsola (2010) similarly found that the unavailability of skilled personnel in Nigerian universities constrained students' access to ICT-based learning. These studies demonstrate that the availability of both material and human resources forms the foundation upon which employability skills are built. Without sufficient funding, higher education institutions are unlikely to adequately prepare graduates for the demands of a competitive and evolving labour market.

Furthermore, while availability is necessary, it is not sufficient; resources must be available and usable to develop employability skills effectively. Usability refers to the extent to which resources are accessible, functional, and applied appropriately within teaching and learning contexts. For example, a university may have well-equipped computer

laboratories. Still, if they are overcrowded, poorly maintained, or inaccessible due to restricted hours, their usability for developing digital and problem-solving skills is limited.

Studies have shown that poor usability often hinders the impact of available resources. Jibrin et al. (2025) observed that students in Nigerian universities were unable to fully benefit from electronic resources due to inadequate training and awareness, despite their availability. Similarly, Adeleke and Olorunsola (2010) reported that the limited usability of ICT resources reduced student satisfaction and constrained opportunities for self-directed learning. Globally, the British Council (2016) argues that employability skills are best developed not only through access but through active, consistent, and meaningful use of resources in practical learning situations.

Human resources are also subject to usability challenges. Even when lecturers and counsellors are available, their effectiveness depends on their teaching competence, engagement with students, and ability to integrate real-world practices into classroom instruction (Crebert et al., 2004). For instance, a laboratory technician's presence is only impactful if students are given adequate time, guidance, and opportunities to use equipment in skill-based learning tasks. According to Nilsson (2010), employability is enhanced when students can use resources in interactive, applied contexts, such as group projects, simulations, or hands-on laboratory work. In essence, usability determines the value derived from available resources. Without usability, resources risk becoming dormant or underutilised, thereby limiting their potential to develop employability skills. Institutions must therefore ensure not only the availability but also the usability of teaching and learning resources to equip graduates for competitive global labour markets.

From an employability perspective, the availability and usability of teaching and learning resources go "beyond access". They influence how effectively students engage with learning activities that mirror real-world professional contexts (Crebert et al., 2004). For example, collaborative use of online learning platforms can foster teamwork, communication, and digital skills; laboratory-based learning can nurture creativity and innovation; and counselling services can strengthen emotional intelligence and resilience (Nilsson, 2010; Knight and Yorke, 2003). When these resources are lacking, poorly maintained, or inaccessible, students may graduate with academic knowledge but without the skills necessary to thrive in competitive labour markets (Andrews and Higson, 2008).

Studies such as Affendy Lee, Tazijan, Mohd Adam, Ikhsanudin, and Aboo Bakar (2025) have emphasised the centrality of transferable skills, including digital literacy, problem solving, collaboration, and creativity, in strengthening national and international competitiveness. For higher education institutions to remain relevant, they must ensure not only that resources are available but also that they are usable, equitable, and aligned with these emerging skill sets (British Council, 2016).

Despite the growing emphasis on employability in higher education policy and practice, a persistent gap remains between the skills graduates possess and those employers demand in the labour market. Much research has focused on curriculum and pedagogy, yet teaching and learning resources, both material and human, to the best of my knowledge, remain underexplored as critical enablers of employability skills. Many institutions face challenges with inadequate availability and poor usability of resources such as computers, internet access, electricity, laboratories, and lecture rooms, which hamper effective teaching and learning. Sometimes, even when resources are available, usability is constrained by poor maintenance, overcrowding, insufficient training, or misalignment with employability-focused practices. These deficits may limit graduates' opportunities to acquire transferable skills. While anecdotal evidence suggests that the availability and usability of teaching and learning resources influence employability outcomes, empirical studies that systematically measure these two dimensions remain scarce. Without such evidence, higher education institutions risk underutilising a critical pathway for preparing graduates to thrive, undermining institutional performance, and weakening national competitiveness in a knowledge-driven global economy. Therefore, this study assesses the availability and usability of teaching and learning resources (both material and human) in higher education institutions.

Theoretical and Conceptual Framework

This study is anchored on the Input→Process→Outcome (IPO) evaluation model, originally developed by Robert Stake (1967), which provides a systematic framework for examining how institutional inputs and instructional processes translate into educational outcomes. In this study, the IPO model is adapted to assess how the availability and usability of teaching and learning materials and resources influence graduates' employability skills.

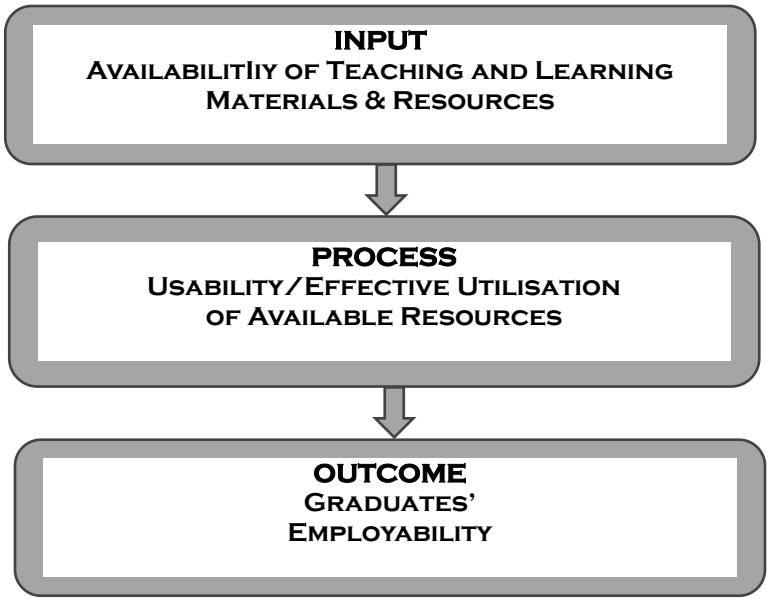

Figure 1 Theoretical framework based on an adapted Input-Process-Outcome (IPO) Model

Source Author's conceptualisation adapted from Stake 1967

The diagram above shows the availability of teaching and learning materials and resources, which represents the input component, indicating the extent to which institutions provide the physical, human, and digital infrastructure necessary for instruction. Usability constitutes the process component and reflects the extent to which available resources are functional, accessible, and effectively integrated into teaching and learning activities. Graduates' employability is the outcome component, capturing their skills, competencies, and work readiness. The model assumes that availability alone is insufficient to enhance employability unless such resources are effectively utilised within instructional processes. Within the IPO framework, usability is conceptualised as a mediating mechanism through which resource availability influences graduates' employability outcomes, as shown in the diagram below:

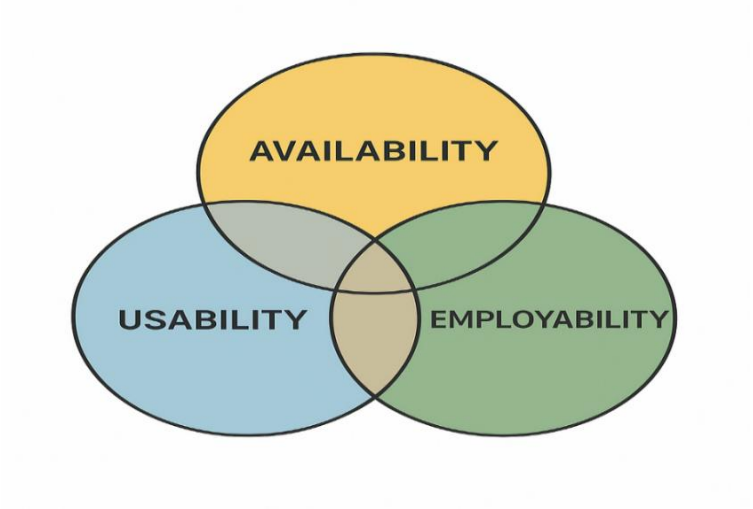

Figure 2 Conceptual framework showing the relationship between the Availability, Usability and Graduate Employability

Source Author's conceptualisation

Objective of the Study

i. To determine the level of availability of teaching and learning materials and resources for effective instruction in higher education institutions.

ii. To assess the usability of the available teaching and learning materials and resources in higher education institutions.

Research Questions

i. What is the level of availability of teaching and learning materials and resources for effective instruction in higher education institutions?

ii. To what extent are the available teaching and learning materials and resources effectively utilised in higher education institutions?

2 Methodology

The study used a descriptive survey design to assess the availability and usability of teaching and learning resources (both material and human) in higher education institutions to develop graduates' employability skills. The population consisted of new graduates from different disciplines across selected higher education institutions. A multistage sampling procedure was employed in the study. Purposive sampling was used to select 1 NYSC orientation camp located in Iseyin LGA, Oyo State, Nigeria. The corps members were stratified based on the six geopolitical zones in Nigeria. From each geopolitical zone, a proportional quota of participants was determined based on their representation in the camp. They were further stratified by discipline, with 32 faculties and 80 higher education institutions capturing institutional diversity, including ownership (federal, state, and private) and type (university, polytechnic, and monotechnic). A simple random sampling technique was used to select 1109 respondents from the selected faculties. A self-developed instrument, the teaching and learning materials and resources inventory (TLMRI), was used to collect data. The availability aspect of the instrument measured the presence/sufficiency of teaching and learning materials and resources, while the usability aspect measured accessibility, ease of use, functionality, alignment with teaching needs, and relevance to employability skill development. The instrument was validated for face and content validity by the psychometricians at the International Centre for Educational Evaluation, Institute of Education, while Cronbach's alpha was used to assess reliability (r=0.93). Before the administration, respondents were informed that the exercise was for academic purposes and that all information would be kept strictly confidential. However, all ethical considerations concerning human subjects were observed. The instrument was administered in person by the researcher with the help of five research assistants, and the data were analysed using descriptive statistics (frequencies and percentages) to measure availability and usability.

3 Results

Table 1 Classification of Levels

Category	Range	Level Description
0 - 49.9	Low	Inadequate or rarely functional
50 - 69.9	Moderate	Available but partially functional
70 – 100	High	Adequate and functional

Table 2 Frequency and Percentage of Availability of Teaching and Learning Materials and Resources in Higher Education Institutions in Nigeria

S/N	TLMR	Available	
		(F)	%
1	Course Outline	1050	94.7
2	Handbook	926	83.5
3	Textual Materials	820	73.9
4	Prospectus	592	53.4
5	Textbooks	859	77.5
6	Modules	712	64.2
7	Activities modules	646	58.3
8	Interactive boards	771	69.5
9	Instructional Manuals	760	68.5
10	Digital learning platforms	744	67.1
11	Research Journals	830	74.8
12	Computer	903	81.4
13	Projector	870	78.4
14	Psychology lab	533	48.1
15	Counselling room	759	68.4
16	Resource room	717	64.7
17	Lecture room	1023	92.2
18	Electricity supply	976	88.0
19	Lab attendant	881	79.4
20	Psychologist	651	58.7
21	Counsellor	891	80.3
22	Lecturers	1037	93.5
23	Students	1039	93.7
24	Internet	969	87.4
25	Laboratory	964	86.9
26	Technician	858	77.4
27	Library	1014	91.4
28	Art theatre	776	70.0
29	E-library	798	72.0
30	Virtual laboratory	512	46.2
31	Academic advisor	939	84.7
32	Mentors	773	69.7
33	Virtual classrooms	735	66.3
34	Collaboratory platforms	688	62.0

(N= 1109; X=67.9)

Table 2 indicates that most higher education institutions have made commendable progress in providing the essential materials and resources for teaching and learning. Beginning with course outlines (94.7%), almost all respondents confirmed their availability, reflecting strong curriculum structure and consistency across programmes. The handbook (83.5%) was available at most institutions, suggesting that academic and administrative information is generally well documented and accessible to students. Availability of textual materials (73.9%) was also substantial, though the remaining 26% without access indicates an uneven distribution of printed academic resources. Half of respondents (53.4%) reported having a prospectus, suggesting that some institutions may lack up-to-date information booklets for incoming or continuing students. Textbooks (77.5%) were widely available, yet nearly a quarter of institutions lacked them, raising concerns about equitable access to foundational instructional texts. Modules (64.2%) and activity modules (58.3%) showed moderate availability, meaning that while structured learning materials exist in many programmes, opportunities for student engagement through practical or activity-based modules remain somewhat limited. The availability of interactive boards (69.5%) suggests that technology-enhanced teaching tools are present in most institutions, but around one-third still teach without such interactive devices. Similarly, instructional manuals (68.5%) are fairly available, which supports teaching standardisation and consistency among lecturers.

Regarding digital and electronic infrastructure, digital learning platforms (67.1%) were available in about two-thirds of the institutions. This demonstrates a growing but incomplete transition to technology-supported learning environments. Access to research journals (74.8%) was relatively high, reinforcing institutional support for scholarship and academic inquiry. Computers (81.4%) were available to a large majority, confirming the presence of fundamental digital tools necessary for research and administrative work. Furthermore, projectors (78.4%) were commonly available, enhancing lecture delivery and visual learning experiences.

However, the availability of specialised facilities was lower. Only 48.1% of respondents confirmed having a psychology laboratory, highlighting limited access to discipline-specific learning environments. The counselling room (68.4%) and resource room (64.7%) had moderate availability, indicating that while some institutions provide these support spaces, many still lack them. Nearly all institutions reported having lecture rooms (92.2%), indicating adequate physical infrastructure for classroom instruction. Electricity supply (88.0%) was also widely available. Most institutions reported having a lab attendant (79.4%), counsellor (80.3%), lecturers (93.5%), and students (93.7%), showing strong human resource support for academic operations. Laboratories (86.9%) were available in most institutions, affirming that practical and experimental learning is possible in many fields.

A high proportion of respondents reported the availability of libraries (91.4%), internet facilities (87.4%), academic advisors (84.7%), and technicians (77.4%), suggesting strong institutional support for core academic and technical functions. Moderately high availability was observed for e-libraries (72.0%), art theatre (70.0%), mentoring structures (69.5%), virtual classrooms (66.3%), and collaboratory platforms (62.0%), indicating growing adoption of digital and collaborative learning resources. However, virtual laboratories recorded relatively low availability (46.2%), reflecting limited provision of advanced technology-driven instructional facilities, which suggests that while foundational resources are largely available, specialised and innovative digital infrastructures remain inadequately provided. Lastly, psychologists (58.7%) were available in slightly more than half of the institutions, showing moderate access to mental health and psychological support services.

From an IPO "input" perspective, this result, with an average availability rate of approximately 67.9%, indicates that higher education institutions are well equipped with basic instructional and physical resources but remain underprepared in digital, specialised, and collaborative facilities. The pattern reflects a traditional resource distribution, prioritising tangible physical inputs over contemporary digital and interactive learning infrastructure.

The usability rate for each teaching and learning resource was computed by dividing the number of respondents who indicated the resource was usable by the total number of respondents (N=1109), then multiplying by 100. The overall usability level was computed as the mean of the usability percentages across the 34 items. This process ensured comparability across resources and provided an aggregate measure of the usability of available teaching and learning materials and resources in higher education institutions.

Table 3 Frequency and Percentage of Usability of Teaching and Learning Materials and Resources in Higher Education Institutions (N = 1109)

S/N	TLMR	Usable	
		(F)	%
1	Course Outline	786	70.9
2	Handbook	687	61.9
3	Textual Materials	525	47.3
4	Prospectus	418	37.7
5	Textbooks	632	57.0
6	Modules	456	41.1
7	Activities modules	434	39.1
8	Interactive boards	514	46.3
9	Instructional Manuals	522	47.1
10	Digital learning platforms	508	45.8
11	Research Journal	576	51.9
12	Computer	593	53.5
13	Projector	563	50.8
14	Psychology lab	339	30.6
15	Counselling room	518	46.7
16	Resource room	486	43.8
17	Lecture room	736	66.4
18	Electricity supply	691	62.3
19	Lab attendant	628	56.6
20	Psychologist	422	38.1
21	Counsellor	593	53.5
22	Lecturers	736	66.4
23	Students	735	66.3
24	Internet	659	59.4
25	Laboratory	672	60.6
26	Technician	593	53.5
27	Library	720	64.9
28	Art theatre	502	45.3
29	E-library	518	46.7
30	Virtual laboratory	321	28.9
31	Academic advisor	611	55.1
32	Mentors	505	45.5
33	Virtual classrooms	501	45.2
34	Collaboratory platforms	499	40.5

(N=1109; X=52.4)

While availability reflects the physical presence of resources, usability highlights the extent to which these resources are functional and effectively integrated into teaching and learning processes. The overall usability rate of 52.4% indicates that nearly half of the available resources are not being used effectively, suggesting challenges with maintenance, accessibility, training, or institutional support.

Starting with the fundamentals, course outlines (70.9%) were widely used, indicating that most lecturers rely on them to structure instruction, though about 30% remain underused or outdated. The handbook (61.9%) was usable in most cases, indicating that institutional policies and guidelines are functional but may need updating in some areas. Usability of textual materials (47.3%) was below half, suggesting problems with relevance, accessibility, or physical condition. Similarly, only 37.7% of respondents found the prospectus usable, indicating that institutional information is not consistently up to date or easily accessible to students.

Textbooks (57.0%) were moderately usable, pointing to issues such as insufficient copies or outdated editions. The modules (41.1%) and activity modules (39.1%) showed low usability, suggesting that even when modular learning materials are available, they are not used during instruction, possibly due to a lack of training or engagement strategies. The usability of interactive boards (46.3%) was relatively low, often due to technical faults or instructors' lack of familiarity. Likewise, instructional manuals (47.1%) were underutilised, hinting at gaps in instructional support or dissemination.

Digital integration remains weak, with only 45.8% of respondents finding digital learning platforms usable, indicating persistent challenges with internet connectivity, student competence, or system maintenance. Similarly, only about half of respondents reported usable research journals (51.9%), which may limit the quality of academic inquiry and research development. The usability of computers (53.5%) is much lower than their availability (81.4%), indicating problems such as outdated software, inadequate numbers, or technical faults. Projectors (50.8%) followed the same pattern: available but not consistently functional.

Specialised learning environments fared even worse. Only 30.6% of the labs were usable, indicating that many lack the necessary equipment or maintenance. The counselling room (46.7%) and resource room (43.8%) had moderate usability, implying that many such spaces exist but are either not adequately staffed or poorly utilised. Lecture rooms (66.4%) were generally usable, but issues such as overcrowding or poor ventilation could explain why about one-third were reported otherwise.

Although electricity supply (62.3%) was available in most places, its usability was much lower, pointing to irregular supply and power interruptions that hinder ICT use. Lab attendants (56.6%) and technicians (53.5%) were usable in only about half of cases, implying gaps in human resource effectiveness and training. Similarly, while counsellors (53.5%) were present in most institutions, their usability indicates that many are unable to provide adequate or consistent support.

Lecturers (66.4%) were considered usable by about two-thirds of respondents, suggesting that some faculty members may be overburdened, undertrained, or limited in their ability to apply innovative teaching methods. Similarly, students (66.3%) were considered usable in learning processes, which may reflect moderate engagement or participation levels. Laboratories (60.6%) were also moderately usable, with evidence of functional challenges, including shortages of consumables, equipment breakdowns, and safety issues.

Access to the internet (59.4%) was usable for nearly 60% of respondents, revealing persistent infrastructural and bandwidth constraints. The library (64.9%) was generally usable, while the art theatre facility (45.3%) and e-library (46.7%) were usable in fewer than half of institutions, reflecting resource underuse or technical limitations.

Digital and collaborative resources continue to struggle with usability: virtual laboratories (28.9%), virtual classrooms (45.2%), and collaboratory platforms (40.5%) are seldom functional, likely due to insufficient infrastructure, maintenance issues, or lack of training. Academic advisors (55.1%) were available at just over half of institutions, suggesting moderate access to academic guidance. Mentors (45.5%) were available in fewer than half of cases, indicating weak institutionalisation of mentorship programs. Finally, psychologists (38.1%) were usable in fewer than four out of ten institutions, suggesting that while some provide mental-health support, such services are often limited in reach or effectiveness.

The usability results paint a picture of resource-rich institutions. Still, those resources are not effectively utilised due to maintenance deficiencies, irregular electricity supply, insufficient technical support, and limited staff competence in using digital and specialised tools. This suggests systemic underutilisation of assets, with institutional quality

assurance mechanisms failing to enforce effective pedagogical use of resources. Bridging the gap between availability and usability will therefore require not just infrastructure investments, but sustained attention to training, maintenance, and institutional management practices that ensure resources translate into meaningful educational outcomes.

4 Discussions of Findings

The study found that higher education institutions have a commendable level of teaching and learning resources, with high availability of course outlines, lecturers, students, and lecture rooms, indicating a solid foundation for instructional delivery. This supports Nwuke and Nwanguma (2024), who emphasised that human and physical resources remain indispensable for achieving quality instruction. Most Nigerian universities provide the fundamental facilities necessary for teaching and learning, though challenges persist in modernisation and accessibility. While this general availability supports traditional teaching, the implications for graduate employability skills are more complex. The presence of lecture rooms and course outlines promotes basic academic engagement. Still, employability skills such as communication, teamwork, and resilience are best developed through interactive, experiential, and resource-rich learning environments rather than conventional lecture formats. Hence, availability in itself may not sufficiently guarantee the kind of learning experiences that cultivate employability-oriented outcomes.

The findings further revealed that laboratories and electricity are relatively available, aligning with Isa (2020), who reported infrastructural progress in Nigerian higher education institutions. Laboratory facilities are vital for nurturing creativity and innovation, and for developing monitoring and evaluation skills, as they provide platforms for experimentation and practical problem-solving. However, the uneven distribution of such resources limits students' equal opportunities to acquire these competencies across disciplines. This inequality aligns with Chuene and Teane (2024), who argued that inequitable resource allocation constrains experiential learning and the implementation of a holistic curriculum. Students in well-equipped faculties are therefore more likely to develop creativity and innovation skills than their counterparts in under-resourced departments.

In contrast, digital and technology-based materials remain inadequately available. Although computers and projectors are moderately accessible, resources such as e-libraries, virtual laboratories, and collaboratory platforms are relatively scarce. This finding aligns with Ndibalema (2025) and Singun (2025), who noted that developing nations often struggle with technological readiness gaps that impede the transition to digital education. The limited availability of such technologies restricts students' opportunities to develop ICT proficiency, financial literacy, and monitoring and evaluation skills that depend on data analysis, online collaboration, and technology-enabled simulations. As a result, graduates may emerge academically qualified but digitally unprepared for the knowledge economy.

The findings also showed that counselling rooms and academic advisors are moderately available, whereas psychologists and mentors are less available. This imbalance signals incomplete psychosocial support systems. Psychosocial resources are as critical as instructional ones for improving students' engagement and well-being (Adetunji and Salako, 2023; UNESCO, 2024). The limited presence of counselling and mentoring structures constrains students' development of resilience and emotional intelligence, which are indispensable for employability in dynamic and stressful work environments. Institutions that lack robust mentoring frameworks may inadvertently graduate students who possess cognitive knowledge but lack the emotional and interpersonal capacities needed for effective stress management, teamwork and leadership.

Overall, the mean availability rate of 67.9% indicates that while most higher education institutions are operationally equipped to deliver instruction, they are not yet technologically advanced. This supports Akaeze and Akaeze (2024), who found that Nigerian higher education institutions possess basic resources but lag in contemporary, skill-enhancing instructional technologies. Thus, availability without alignment with employability-oriented outcomes leads to resource sufficiency without relevance. The development of communication, teamwork, creativity, and ICT proficiency requires not only resources but also the strategic provision of modern, interactive, and inclusive facilities that prepare students for 21st-century workforce realities.

For usability, the findings revealed that, despite satisfactory availability, the usability of materials and resources is considerably lower, averaging 52.4%, suggesting that nearly half of the available materials are obsolete, underutilised, or non-functional. This finding confirms Crompton's (2023) argument that technology and instructional materials contribute meaningfully to learning outcomes only when effectively integrated and regularly maintained.

High usability scores for course outlines and lecture rooms indicate that core instructional processes are relatively efficient. However, the moderate usability of computers and the low usability of digital learning platforms and virtual laboratories reflect infrastructural and competence-related challenges. Akaeze and Akaeze (2024) observed that limited digital literacy among lecturers and inadequate institutional support hinder the optimal use of educational technologies. Similarly, Diseph (2021) reported that while most Nigerian universities possess e-learning infrastructure, poor usability undermines its impact on instructional effectiveness. This has clear implications for the development of employability skills. When digital and interactive learning tools are underutilised, students lose valuable opportunities to strengthen ICT proficiency, innovation, and monitoring and evaluation skills. Moreover, poor usability reduces experiential learning opportunities that foster creativity, communication, and teamwork.

The finding on the limited usability of traditional resources such as textbooks and libraries further supports Emmanuel and Augustine (2021), who found that outdated materials and inadequate library management systems restrict students' access to current information. Similarly, Ofor-Douglas (2024) emphasised that insufficient funding and irregular maintenance lead to frequent breakdowns of academic facilities, thereby reducing their usability. This situation restricts exposure to updated content necessary for building financial literacy and other contemporary employability-related competencies.

Psychosocial and student-support facilities were also rated low in usability, with counselling rooms and mentors failing to meet expectations. This aligns with Ebonine, Umoren, and Ekpobio (2025), who highlighted that student-support infrastructure in Nigerian higher education institutions is often neglected in maintenance budgets, thereby limiting their operational efficiency. The observed gap between availability and usability reflects what UNESCO (2021) termed a "functionality deficit," which means the existence of resources in form but not in functional reality. Such a deficit undermines the holistic development of resilience, emotional intelligence, and communication skills that emerge through effective student support systems.

These findings collectively reinforce the need for institutional emphasis on functionality rather than mere provision. Fashiku and Abubakar (2019) argue that true educational transformation occurs only when available resources are well utilised, maintained, pedagogically integrated, and supported by staff capacity development. Thus, the lower usability rate signals the need for enhanced maintenance culture, digital competence, and administrative accountability in higher education institutions. Functionality and usability directly influence how well students can develop transferable employability skills and transition successfully into the labour market.

5 Conclusions

This study assessed the availability and usability of teaching and learning materials in higher education institutions as determinants of graduates' employability skills. A descriptive survey of 1,109 respondents from 80 institutions found a high level of resource availability (67.9%) but lower usability (52.4%). While lecture rooms, course outlines, and textbooks were widely available, digital, collaborative, and psychosocial resources were less accessible and poorly utilised. The study concludes that availability alone does not ensure employability readiness; rather, the functional use and pedagogical integration of resources determine how much students acquire relevant labour-market skills. The study reveals that limited resources constrain graduates' capacity to develop transferable skills such as creativity, teamwork, and digital literacy. This contributes to the persistent mismatch between academic preparation and workplace expectations. Improving resource usability will strengthen experiential learning, enhance employability, and promote social and economic development by producing graduates who are adaptable, innovative, and workforce-ready. Institutional managers should focus on improving the functionality and maintenance of existing resources rather than merely acquiring them. Usability audits should be part of institutional quality assurance, and staff training in digital and skills-based pedagogy is essential. Policymakers should integrate usability indicators into accreditation standards and allocate funds for resource maintenance, digital transformation, and employability-focused teaching practices. Theoretically, the study posits that usability mediates the relationship between resource availability and employability outcomes. It extends employability theory by proposing that the practical and functional use of resources mediates the relationship between institutional inputs and graduate competencies.

Based on the findings of this study, higher education institutions should prioritise enhancing the usability of both digital and practical teaching and learning resources by embedding employability skills into instructional practices through project-based and real-world learning approaches. Institutions should also strengthen psychosocial support

systems to foster students' resilience, emotional intelligence, and adaptability, which are critical attributes for sustainable employability. In addition, regular updating of learning materials to reflect industry-relevant content, alongside capacity building for academic staff in technology-enhanced and employability-focused pedagogy, is necessary to ensure closer alignment between higher education outcomes and labour-market demands. Furthermore, usability audits should be institutionalised within quality assurance systems, with routine evaluation of the functionality and accessibility of teaching and learning resources to ensure that institutional investments effectively support skill development and graduate employability.

Practical Implication

The findings of this study have important social, managerial, and policy implications for higher education systems seeking to enhance graduate employability. Socially and practically, the observed gap between the availability and usability of teaching and learning resources suggests that access to facilities alone is insufficient for effective skill development. Improving the functional use of available resources can enhance students' acquisition of employability skills and contribute to better labour-market outcomes.

From a managerial perspective, the results indicate that institutional leaders should shift attention from resource acquisition to resource utilisation. Institutions can use the availability–usability distinction to identify underutilised facilities, strengthen technical and academic support structures, and promote instructional practices that integrate available resources into teaching and learning.

At the policy level, the findings highlight the need for higher education policies and quality assurance frameworks to move beyond infrastructure provision and incorporate usability indicators. Linking funding, accreditation, and institutional evaluation to the effective use of teaching and learning resources may strengthen accountability and ensure that investments in higher education translate into improved graduate employability outcomes.

Limitations and Future Research Directions

This study was limited by its reliance on student reports, which may not fully reflect the actual utilisation of resources. Moreover, it did not assess the direct relationship between resource availability and usability and actual employability skill outcomes. However, future studies could employ a longitudinal design to triangulate findings and better establish causal relationships. Undertake comparative studies between public and private institutions to understand variations in employability-oriented resource use, and develop intervention-based research to test models that integrate resource usability with skill-based learning outcomes in higher education.

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Availability Statement

Data will be made available on request.

Conflict of Interest

The author declares no conflicts of interest.

Declaration of generative AI usage

Generative AI tools were used solely for language editing (grammar, clarity, and formatting) and did not contribute to the study's design, data collection, analysis, interpretation, or conclusions

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