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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 design of descriptive survey research type was adopted. Using a multistage sampling precedure, 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 However, resource usability was only moderate (52.4%), suggesting that many available resources were underutilised, outdated, or poorly maintained.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 represents the input, usability serves as the mediating process, and graduates' employability is the outcome. By highlighting usability as a mediating mechanism linking resources to employability outcomes, the study extends existing literature beyond mere resource provision.

Practical and Social Implications: Improving the usability of teaching and learning resources can enhance experiential learning, reduce graduate skills gaps, 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 capable of applying 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 such as Crebert, Bates, Bell, Patrick, and Cragnolini, (2004), and Andrews and Higson (2008) have 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 these 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 the ability of institutions to deliver quality education and prepare graduates for the labour market. Research consistently highlights that inadequate provision of resources undermines teaching and learning effectiveness such as those conducted by Ogunode, Jegede and Musa (2021). Similarly, Ayoko, Peter and Jegede (2021) notes that overcrowded lecture rooms, outdated laboratory facilities, and poor library infrastructure in Nigerian universities limit students' ability to engage in active learning. Similarly, it was found that insufficient teaching and learning resources in Ghanaian schools negatively impacted the achievement of learning outcomes (Partey, Annim, Yidana, and Sebu, 2024; Saayir and Pufaa 2021). At a global level, the 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. Where institutions are understaffed, students often miss out on personalised guidance, limiting their ability to acquire employability-related 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 provision, higher education institutions are unlikely to prepare graduates adequately for the demands of a competitive and evolving labour market.

Also, while availability is necessary, it is not sufficient; resources must also be usable for them to effectively support employability skills development. 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, but 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 benefit fully from electronic resources due to inadequate training and awareness, despite availability. Similarly, Adeleke and Olorunsola (2010) reported that 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 are able to use resources in interactive and 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 contribute to employability skills development. 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 students can effectively 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, while 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 growing emphasis on employability in higher education policy and practice, a persistent gap exists between the skills graduates possess and those demanded by employers 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 of inadequate availability and poor usability of resources such as computers, internet access, electricity, laboratories, lecture rooms etc. and this hampers 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 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 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.

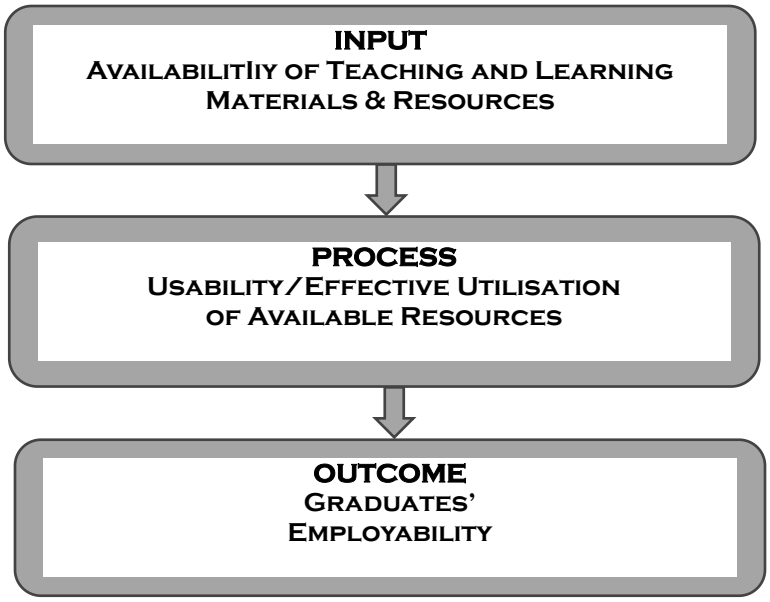

Figure 1 Theoretical framework based on an adapted Input-Process-Outcome (IPO) Model

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 represents the outcome component, capturing the skills, competencies, and work-readiness of graduates. 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 on the diagram below:

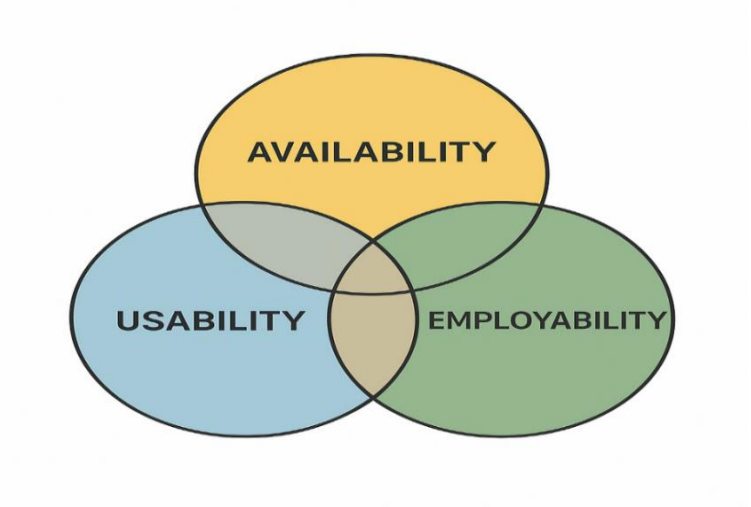

Figure 2 Conceptual framework showing the relationship between the Availability, Usability and Graduate Employability

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 utilized in higher education institutions?

2 Methodoloy

The study adopted a non-experimental design of descriptive survey research to measure 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 technique was used in selecting 1 NYSC orientation camp located at 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 into different disciplines with a total of 32 faculties and 80 higher education institutions capturing institutional diversity such as ownership (federal, state and private) and type (university, polytechnic, and monotechnic) represented. Simple random sampling technique was used to select 1109 respondents which emerged from within the selected faculties. Self-developed instruments called teaching and learning materials and resources inventory (TLMRI) was used for data collection. 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 using face and content validity by the psychometricians in the International Centre for Educational Evaluation, Institute of Education while Cronbach alpha was used to ascertain the reliability at (r=0.93). Before administration, respondents were told that the exercise is for academic purpose and all information will be kept in strict confidentiality. However, all ethical considerations concerning human subject was observed. The instrument was administered in person by the researcher with the help of 5 research assistants and data were analysed using descriptive statistics (frequency, and percentages) to measure availability and usability levels.

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 reveals that most higher education institutions have made commendable progress in providing the essential materials and resources required 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 in 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 the availability of a prospectus, implying that some institutions may lack up-to-date information booklets for incoming or continuing students. Textbooks (77.5%) were widely available, yet the finding

revealed that nearly a quarter of institutions lack them and this raises concerns about equitable access to foundational instructional texts. Modules (64.2%) and activity modules (58.3%) showed moderate levels of availability, which means 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 specialized 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 the presence of lecture rooms (92.2%), confirming 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 suggest 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% revealed that higher education institutions are well-equipped with basic instructional and physical resources but remain underprepared in digital, specialized, 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 that the resource was usable by the total number of respondents (N=1109), multiplied by 100. The overall usability level was obtained by computing the mean of the usability percentages across the 34 items. This process ensured comparability across resources and provided aggregate measure of the extent to which available teaching and learning materials and resources were usable 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 effectively used, suggesting challenges related to maintenance, accessibility, training, or institutional support.

Starting with the fundamentals, course outlines (70.9%) were widely usable, indicating that most lecturers rely on them for structuring instruction, though about 30% remain underused or outdated. The handbook (61.9%) was usable in a majority of cases, showing that institutional policies and guidelines are functional but may need updating in some places. 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 activities modules (39.1%) showed low usability, suggesting that even where modular learning materials exist, they are not actively used during instruction, possibly due to lack of training or engagement strategies. The usability of interactive boards (46.3%) was relatively low, often due to technical faults or lack of familiarity among instructors. Likewise, instructional manuals (47.1%) were underutilised, hinting at gaps in instructional support or dissemination.

Digital integration remains weak, as only 45.8% found digital learning platforms usable, revealing persistent challenges in 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% found the psychology lab usable, showing that many of these labs lack necessary equipment or maintenance. The counselling room (46.7%) and resource room (43.8%) had moderate usability, implying that many of 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 found to be usable by about two-thirds of respondents, implying that some faculty members may be overburdened, undertrained, or limited in applying 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 such as lack of consumables, equipment breakdown, or safety issues.

Access to 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 usable in just over half of the institutions, suggesting moderate access to academic guidance. Mentors (45.5%) were usable in less 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 institutions that are resource-rich but 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 a systemic underutilisation of assets, where institutional quality assurance mechanisms may not be enforcing effective pedagogical application 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 findings of the study revealed that higher education institutions possess a commendable level of teaching and learning materials, with high availability of course outlines, lecturers, students, and lecture rooms signifying 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 modernization 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, but 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, innovation, and monitoring and evaluation skills, as they provide platforms for experimentation and practical problem-solving. However, the uneven distribution of such resources limits equal opportunities for students to acquire these competencies across disciplines. This inequality is in line with Chuene and Teane (2024), who argued that inequitable resource allocation constrains experiential learning and holistic curriculum implementation. 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. Limited availability of such technologies restricts opportunities for students 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, while psychologists and mentors record lower availability. 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, but 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 the presence of resources but also the strategic provisioning of modern, interactive, and inclusive facilities that prepare students for 21st-century workforce realities.

For usability, the findings revealed that despite satisfactory availability levels, the usability of materials and resources is considerably lower, with an average of 52.4%, suggesting that nearly half of the available materials are either obsolete, underutilized, or non-functional. This finding confirms the argument of Crompton (2023) 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 employability skills development. When digital and interactive learning tools are underutilized, 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 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) emphasized 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 also recorded low usability, with counselling rooms and mentors performing below expectations. This is in line with Ebonine, Umoren, and Ekpobio (2025), who highlighted that student-support infrastructures in Nigerian higher education institutions are 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 utilized, 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. Using a descriptive survey of 1,109 respondents from 80 institutions, findings showed 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 utilized. The study concludes that availability alone does not ensure employability readiness; rather, the functional use and pedagogical integration of resources determine the extent to which students acquire relevant skills for the labour market. The study reveals that low usability of resources limits 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 mere acquisition. Usability audits should form part of institutional quality assurance, while staff training in digital and skill-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 introduces usability as a mediator 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 report which may not fully reflect the actual utilisation of resources. Also, it did not assess the direct relationship between resource availability and usability and actual employability skill outcomes. However, future studies could employ 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 declare no conflicts of interest.

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