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LIBRARIES AND LIBRARIANS BRIDGING THE GAP IN ENHANCING DIGITAL LITERACY AND INCLUSIVE EDUCATION FOR PRE-SERVICE TEACHERS: A MIXED METHOD STUDY

BY

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Abstract

Purpose: *This study examined the role of libraries and librarians in enhancing digital literacy and inclusive education for pre-service teachers across 18 Nigerian institutions.*

Design/Methodology/Approach: *The descriptive survey research design was adopted for this study. Six objectives were to guide the conduct of this study. Total enumeration technique was adopted involving 44 librarians and teacher educators. Data were collected through observation and questionnaire method via Google Forms, achieving a 100% response rate. The study assessed current practices, collaboration patterns, types of digital literacy training provided, frequency and modes of communication, and challenges in collaborating with teacher educators. Descriptive statistics including frequencies, percentages, means, and standard deviations were employed in analysing the data and qualitative data from the semi-structured interviews were analyzed using thematic analysis.*

Findings: *The results revealed that librarians demonstrated moderate engagement in digital literacy and inclusive education practices. The highest-rated practices included providing guidance on library resources and offering one-on-one research support, while training on information literacy and evaluating online sources were the most frequently provided training types. Collaboration between librarians and teacher educators was moderate, with professional development opportunities for pre-service teachers rated highest Communication frequency was moderate, with WhatsApp and text messages as the most frequently used platforms. Major challenges included teacher educators looking down on librarians as bookkeepers, inability to keep up with emerging technologies, and curriculum integration difficulties. Institutional representation was diverse, with Emmanuel Alayande University of Education and Tai Solarin Federal University of Education with the highest participation. Most respondents held Master's degrees, had 11–15 years of computer experience and 21+ years of work experience.*

Implication*: The study concludes that while librarians actively support digital literacy through training and research support, systemic challenges including role perception, technological gaps, and limited collaboration frameworks hinder optimal contribution to pre-service teacher preparation.*

Originality/value: *Based on the outcome of the study, recommendations include developing formal collaboration policies, enhancing technological infrastructure, expanding digital literacy training programs, establishing structured communication channels, integrating digital literacy across teacher education curricula, and fostering institutional cultures that recognize librarians as instructional partners.*

Keywords: *Digital literacy, Inclusive education, Librarians, Libraries, Nigeria, pre-service teachers, Teacher education*

Paper type*: Empirical research*

Introduction

The penetration of digital technology in every aspect of human endeavour is no longer news. Digital technology has set out a revolution not only in how humans preserve, transmit or disseminate recorded knowledge, historical records, and other kinds of communication

but also affects the way individuals seek and gain access to these information carrying resources (Emiri, 2015). The integration of technology in education has positively transformed the way students learn and teachers teach. However, the effective use of digital technology in education requires more than just having access to devices and Internet connectivity. It basically demands for a certain level of digital literacy. Digital literacy is an essential component of education that pre-service teachers of this current age should acquire and possess. Digital literacy has to do with the ability to understand information and perform tasks digitally in a digital environment. The emphasis on paper at present has reduced as a medium of information with the digital environment taking a larger portion and space. Hence, a pre-service teacher who desires to succeed in this digital environment needs to be digitally literate in order to understand and use information from variety of digital sources.

The American Library Association (2013) describes digital literacy as the ability to use information and communication technologies to find, evaluate, create and communicate information requiring both cognitive and technical skills. United Nations Educational Scientific and Cultural Organization (UNESCO) (2018) similarly described digital literacy as the ability to use digital technologies to access, manage, integrate, evaluate, and create information. Pre-service teachers who, are future educators, need to possess digital literacy skills to effectively integrate technology into their teaching practices. In addition to digital literacy, pre-service teachers also need to be equipped with the skills and knowledge to promote inclusive education. Inclusive education is an approach to education that values diversity and promotes equal opportunities for all students to participate and succeed (United Nations Educational Scientific and Cultural Organization (UNESCO), 2020).

Inclusive education is the educational method through which all children learn together in the same classroom irrespective of their race, gender, religion, individual learning needs, socioeconomic level, and cultural backgrounds (United Nations Educational Scientific and Cultural Organization (UNESCO), as cited by (Massouti, 2021). In the same vein, Subramaniam and Jaeger (2010) and Kuhlthau (2015) opined that inclusive education ensures that all individuals, regardless of their abilities, have equal access to educational opportunities.

Inclusive education involves different and varied students learning side by side in the same classroom. It is an

attempt at educating students with special educational needs and in a strictly inclusive setting, every child feels safe and has a sense of belonging. Inclusive education values diversity and the distinctive contributions each student brings to the classroom. Based on inclusion model, students with special needs spend most or all of their time with non-disabled students regardless of their strengths or weaknesses in any area, and seek to maximize the potential of all students. Effective inclusive education occurs predominantly through accepting, understanding, and attending to these students' differences and diversities, which can include physical, cognitive, academic, social, and emotional needs.

Similarly, Albalhareth and Saleem (2023) stressed that inclusive education aims to ensure that all students have access to education by adapting to their diverse needs, including those of individuals with special requirements. Children with special needs in developing countries face diverse challenges and difficulties, linked to poverty and social barriers. Every child has the right to education, however, in some traditional cultures, a child with a disability is seen as a bad omen, bad luck. Most often, they are hidden from the community and kept out of school and those that managed to attend school oftentimes face embarrassment, discrimination and misunderstanding.

Regrettably, prior before now, many people assumed that the best place for children with disabilities should be in a special school or classroom, separated from their normal peers. At present, however, experts and persons with disabilities believe that inclusive education offers the best opportunity for social integration and self-sufficiency. Consequent upon the growing needs of the inclusive classroom, a reconsideration of teacher training practices and programmes is very significant in teacher education research to warrant that future teachers are ready to practice inclusive teaching. That is why pre-service teachers are very fundamental in inclusive education. Pre-service teachers are students enrolled in colleges of education or university education programmes who are being trained to become licensed educators and aspiring educators undergoing academic coursework and practical classroom training and they are not yet fully certified as teachers.

Therefore, libraries and librarians play a critical role in bridging the gap in enhancing digital literacy and inclusive education for pre-service teachers. By leveraging technology and innovative pedagogies, libraries and librarians can

help bridge the digital divide and promote inclusive education.

Objectives

The objectives of the study sought to:

i. Find out the current practices in digital literacy and inclusive education;
ii. Investigate how libraries and librarians collaborate to provide digital literacy and inclusive education
iii. Determine the types of digital literacy training provided by librarians
iv. Find out the frequency of the librarians' communication with pre-service teachers;
v. Find out what challenges librarians face in collaborating with teacher educators in the development of digital literacy;
vi. Find out what challenges librarians face to support preservice digital literacy

Review of Related Literature

In this digital era, pre-service teachers are challenged to improve in their teaching methods. Digital technology has recently emerged as a promising, influential, and transformative tool for achieving new educational objectives (Alnasib, 2023). Librarians can provide a long-term solution by supporting pre-service teachers and assisting students through enough information resources provision and a platform for their use. Digital literacy refers to the ability to effectively use digital technologies to access, evaluate and create information. It represents vital tools that enable an individual to participate in all aspects of the society as an effective citizen (Ata & Yıldırım, 2019) and is one of the basic skills teachers must possess (Tomczyk, 2021). Digital literacy means having the ability to use technology to its fullest effect, ethically, efficiently and effectively to meet the information needs in personal, civic, and professional lives and also, to evaluate internet resources, which differs qualitatively and quantitatively from evaluative skills required for printed materials (Edewor & Agbro, 2024; Okere, 2024).

Extant literature has emphasised the value of developing pre-service teachers' digital literacy skills and competences (Lindfors *et al., 2021*). Masoumi (2021) described enhancing pre-service teachers' digital literacy skills and competence as a process that would enable them to reflect, interact, and employ technological knowledge in their future educational practices. In addition, pre-service teachers will be enabled to maintain instructional self-efficacy in technology-rich classrooms (Elstad & Christophersen, 2017). Similarly, Hairida *et al (*2023) stressed that digital technology cannot be separated from education as it supports teaching and learning activities.

Therefore, pre-service teachers must have digital literacy and librarians have a significant role to play for them to achieve that.

Current practices in digital literacy and inclusive education

The integration of digital technologies into education has transformed teaching and learning processes, creating both opportunities and challenges for teacher preparation programmes. For pre-service teachers, developing robust digital literacy skills is particularly crucial as they prepare to create inclusive learning environments that serve diverse students' populations, including those with special educational needs (Aslan, 2020). The ability to choose the right tools by pre-service teachers will also guide learners to succeed in their learning (Suwarto *et al., 2022*)

Libraries and librarians are uniquely positioned at the connection of information science, technology integration, and educational pedagogy. Professionally trained librarians are consequently natural partners in efforts to enhance digital literacy among pre-service teachers. However, the extent to which these partnerships are realized, the practices employed, and the challenges encountered remain areas requiring systematic investigation. Nur, Nanik and Fahmi (2024) investigated the digital literacy of pre-service teachers in a study. Using descriptive statistics, the researcher analyzed data collected from pre-service teachers enrolled in a Teaching Assistance Programme, using a framework designed to assess teacher digital literacy across five key dimensions: information management, team-based learning, information processing and presentation, digital integrity, and social responsibility. The findings disclose that pre-service teachers showcased a high level of digital literacy across all areas. Another research conducted by Liza and Andriyanti (2020) showed that pre-service teachers had a high level of digital literacy and were ready to apply digital technologies to their teaching activities and mandates.

Tomczyk (2020) identified heterogeneous digital literacy subgroups among teaching populations and identified three distinctive digital literacy profiles: digital novices, ethical digital explorers and digital pioneers. The existence of these distinct profiles suggests that all approaches to digital literacy training are likely to be inadequate, necessitating differentiated instruction tailored to varying competency levels. Tomcyyk (2020) noted that digital novices represented the smallest but most concerning group, lacking foundational digital competencies essential for contemporary teaching; ethical digital explorers, comprised the majority,

demonstrated moderate competencies with strengths in ethical considerations of technology use; and digital pioneers, represented approximately one-quarter of pre-service teachers who exhibited advanced digital competencies and innovative approaches to technology integration. These profiles were significantly influenced by demographic factors, academic achievements, and professional engagement, including gender, grade level, engagement in digital technology courses, and participation in professional development activities.

Incorporating digital literacies into education recognizes the multidimensional nature of digital communication and information dissemination. Thus, by furnishing pre-service teachers with digital literacy skills, educators empower them to effectively navigate and utilize digital resources in their teaching practices (Nur, Nanik & Fahmi, 2024). Encouraging digital literacies among pre-service teachers would prepare students for active participation in an increasingly digitalized society, where effective communication and information literacy skills are indispensable for success.

Digital literacy entails more than regular technical proficiency. It involves mastering conceptual ideas and principles including development of diverse skills and competencies like critical thinking, creativity, collaboration in secure online communication, and cultural awareness (Strutynska *et al*., 2021). Therefore, mastering digital literacy by pre-service teachers can help them design interactive lessons, facilitate collaborative learning experiences, and engage students in multimedia-rich educational content.

Collaboration to provide digital literacy and inclusive education

Obiyan and Ugwuanya (2022) identified three skill indicators of digital literacy as information skills, digital tools usage and digital transformation. Collaboration between and among libraries and librarians across board remains very essential for the provision of effective digital literacy to pre-service teachers. As librarians are now instructional partners, teachers, leaders, information specialists, and programme administrators, their expanded role positions them at a vantage position to be innovators, transformation agents, and technology integration leaders, who are well-equipped to support pre-service teachers in developing digital competency and skills.

The conceptual foundation for librarian-teacher collaboration rests on the instructional partnership model, wherein librarians function as co-teachers rather than supplementary resources (Clarke, Kretz & Fena, 2025). This positions librarians as possessing complementary

expertise in information organization, digital resource evaluation, and research methodologies that enrich classroom instruction. It is evident that when librarians partner with classroom teachers as co-educators, students' achievements improve significantly, especially in areas requiring critical information engagement and digital literacy skills enhancing learning outcomes (Clarke, Kretz & Fena, 2025). Collaboration enables libraries, librarians and educators to jointly design learning experiences that could address both information literacy goals and teacher preparation standards including lesson plans and supporting inclusive education for students with disabilities (Giles, Baker & Willis, 2024).

Similarly, Yelwa (2024) opined that libraries and librarians collaborate to drive digital literacy and inclusive education by co-designing tailored training programmes, integrating assistive technologies, and partnering with community organizations. They bridge digital divides of pre-service teachers by providing equitable technology access, curating accessible digital resources, and embedding critical information literacy skills into academic and lifelong learning curricula. Librarians have become pivotal in driving digital inclusion efforts; therefore it is imperative for them to be equally digital literate. Khan (2020) investigated the level of digital literacy skills of librarians in Pakistani and reported a poor level of skills that were incompatible with the librarianship job market. The study findings indicated that the library professionals were neither motivated to enhance their current level of digital literacy skills nor able to acquire these skills due to the unavailability of training facilities and the presence of other barriers such as inadequate infrastructure, lack of interest, and technophobia among others.

On the contrary, Atchrimi and Ogunbodede (2024) investigated the digital competencies of librarians in university libraries in South-South Nigeria. This was with intent to ascertain the digital competencies of librarians; methods used in acquiring digital literacy skills, and the challenges they face in so doing. They reported that librarians had a high level of basic digital competence skills and employ various methods to acquire digital skills. Inconsistent power supply, poor ICT facilities, and lack of ICT training opportunities among others were some of the challenges faced by librarians in acquiring digital skills. In the same vein, *Hamad et al*. (2020) examined the impact of librarians' digital literacy on the use of technology in Jordanian academic libraries. The results showed that librarians had a high degree of digital proficiency

and that gender, and other variables have little bearing on academic librarians' digital skills.

In other studies, Osinulu (2021) and Okeji *et al* (2020) surveyed the digital skills of librarians in state and federal colleges in Ogun State, Nigeria, and digital literacy skills of 21st century librarians in private university libraries in Anambra State, respectively. The results of both studies indicated that the librarians had a high level of digital literacy proficiency. Nevertheless, some studies have reported relatively low and moderate levels of digital competency among librarians. For example, Endouware and Dushu (2021) conducted a study on the digital literacy of academic librarians in Nigerian universities that revealed a poor level of digital literacy among librarians. More so, prior study by Oguche (2017) on evaluation of ICT skills of library personnel reported an average level of proficiency.

By implication, it can be deduced that librarians at different institutions have achieved good digital literacy skills, and they can function well in digital library environments which will aid effective collaboration. One novel collaborative model that can be used is the Association of College and Research Libraries (ACRL) Framework for Information Literacy for Higher Education, specifically the Companion Document for Instruction for Educators, to create multi-modal text sets with pre-service teachers that incorporate aspects of diversity, equity, and inclusion. Academic librarians working with kindergartens, primary and pre-primary pre-service teachers can incorporate implicit teachings of information literacy frames into lesson plans, bridging the predominant goals of information literacy frameworks with teacher preparation standards. This approach develops students' abilities to be critical consumers and creators in the information ecosystem while simultaneously addressing common core-based standards and state-level curricular requirements. As Churchill (2020) posits, proficiency in digital literacy equips pre-service teachers with the tools and strategies needed to leverage technology to enhance teaching and learning processes.

Types of digital literacy training provided by librarians

Empirical research indicates that digital literacy training provided by librarians generally spans five core areas like foundational Personal Computer (PC) skills, information retrieval, digital content creation, e-safety, and library software management (Osinulu, 2021; Endouware & Dushu 2021). This training is typically delivered through formal workshops, practical hands-on classes, and one-on-one

virtual or physical guidance. In addition, empirical evidence shows that librarians train pre-service teachers on information retrieval, critical evaluation, copyright, and the integration of digital tools into pedagogy. These training programs empower future educators to utilize electronic resources, manage digital content, and promote responsible digital citizenship in their future classrooms (Rathod & Girish, 2025).

The foundational training provided by librarians centres on information literacy, that is, the ability to locate, evaluate, and use information effectively. For pre-service teachers, this extends beyond personal information management to include pedagogical applications: teaching students how to become critical consumers and creators in the information ecosystem. Other primary training modules that librarians provide to pre-service teachers include how to evaluate and retrieve needed information using databases, through organising workshops on how to use using specific instructional platforms, creating digital content, and applying frameworks to blend digital tools into lesson plans, provision of training on copyright laws, data privacy, avoiding plagiarism, and the ethical use of digital materials and guidance on how to use Online Public Access Catalogs (OPACs), institutional repositories, and virtual reference services for their academic mandates.

This aligns with the study of Okeji *et al* (2020) who averred that librarians in private universities in Anambra State possess digital literacy skills and the librarians most often sponsor themselves to training on digital literacy at least twice a year. Regrettably in Nigeria, while librarians provide fundamental digital literacy instruction, the trainers (librarians) frequently rely on self-sponsorship and trial-and-error to learn (Oyelude, 2026). Additionally, digital librarians provide training for pre-service teachers on multimodal literacy, recognizing that effective communication in digital environments requires competence across multiple formats. Training in this area includes the use of audiobooks, e-books, graphic novels, digital storytelling tools, and multimedia creation platforms. Librarians guide pre-service teachers in blending traditional reading practices with digital tools, including selected AI applications, to create engaging learning experiences that appeal to diverse student learning profiles (Xiao, Wang, & Li, 2025).

Furthermore, librarians play a critical role in providing inclusive digital resources and tools that support diverse learners. This includes training pre-service teachers in the selection and

implementation of assistive technologies, accessibility features of mainstream digital tools, and universal design for learning (UDL) principles applied to digital content creation. The provision of inclusive digital resources represents a specialized area where librarians' expertise in collection development intersects with pre-service teachers' need to serve diverse students' populations (Prachagool *et al*., 2022). Therefore, libraries and librarians bridge the gap between basic internet use and pedagogical digital proficiency through the targeted methods among others. Librarians support pre-service teachers by acting as pedagogical partners and ensure that future educators (pre-service teachers) are equipped to teach students with diverse learning needs and backgrounds.

Frequency of librarians' communication with pre-service teachers

Communication is very important for service delivery and pre-service teachers often have limited (if any) collaborative interactions with librarians during their preparatory programmes. This suggests that librarians-pre-service teachers' communication may be infrequent or inconsistent across teacher education programmes. When collaborations do occur, they tend to be structured as course-embedded experiences rather than on-going, sustained interactions. For instance, the COVID-19 pandemic demonstrated the critical need for librarian - teacher collaboration, as librarians proved instrumentals in supporting remote learning and providing blended learning opportunities (Efe, 2023; Oyelude & Okere, 2022).

However, the pandemic's disruption also revealed that many pre-service teachers had not been exposed to online instruction during their preparatory programmes, suggesting that pre-service training had not adequately incorporated librarians' expertise. This gap indicates that communication frequency remains a significant variable affecting pre-service teacher preparedness (Yelwa, 2024). Libraries and librarians communicate with pre-service teachers by embedding information literacy instruction directly into education coursework, hosting collaborative orientation workshops, and providing targeted research guides. The goal is to build these skills so that pre-service teachers can model them in their own classrooms.

An increasing amount of research shows that although there is widespread recognition of the potential for collaboration between librarians and teachers, actual communication and collaborative engagement with pre-service teachers is still irregular, superficial, and mostly limited to simple service

transactions rather than meaningful instructional partnerships and where communication does occur, it tends to cluster at lower levels of collaboration. Librarians-pre-service teacher communication is predominantly transactional and focused on resource acquisition, rather than pedagogical partnership particularly during lesson planning (Green, & Chassereau, 2023; Giles, Baker, & Willis, 2024). This could be because of some barriers such as pre-service teachers' inadequate understanding of the librarian's instructional role and collaborative potential in their work activities. Previous study by Moreillon (2014) found that communication was largely confined to in-class work sessions, with little to no contact occurring outside of structured meeting times and even when librarians-initiated efforts occurred to establish communication through shared documents or emails, these attempts often failed to yield sustained dialogue.

Challenges in collaborating with teacher educators for digital literacy development

One of the fundamental challenges is the perception of teacher educators that transcends to pre-service teachers' perception. Instead of seeing librarians as teaching colleagues, many academic members / faculty misinterpret their function as "service providers" only who educate students and other users on how to conduct research. Research has also identified institutional barriers such as inadequate electronic resources, lack of library commitment from administration, and insufficient technological infrastructure, lack of shared planning time, lack of structured pathways for librarians to assume teaching roles, lack of relationship building, fragmented and unsupported professional learning routes among others (Smith, 2023; Ijoko, 2025; Mourão & Pereira, 2026).

While librarians possess expertise to lead digital literacy initiatives, systemic reforms in accreditation, curriculum design, and institutional recognition are essential for them to be effectively integrated into teaching structures. Without institutional recognition and structured pathways, librarians cannot be effectively integrated into teaching structures for digital literacy development and for effective performance of pre-service teachers.

Opportunities to support pre-service teachers among librarians

Researchers have identified several meaningful opportunities for librarians to support pre-service teachers during their preparation programmes. These opportunities range from direct collaborative experiences to modelling instructional partnerships and providing

access to relevant resources. One of the most significant opportunities for librarians is supporting pre-service teachers in integrating technology into their lesson planning and modelling collaborative instructional structures during pre-service education. Technology-mediated collaboration offers another opportunity for supporting pre-service teachers. Online Professional Learning Communities (OPLCs) that include pre-service teachers, cooperating teachers, university faculty, and school librarians provide a solid foundation for professional development and future collaborations (Edwards, 2025).

Librarians can support pre-service teachers by providing meaningful access to high-quality instructional materials. Sustained education-library collaborations have produced initiatives such as Book Bundles, the Play Library, and Play Boxes that expand pre-service teacher access to resources (Shepard, Meredith, & Dousay, 2015). These initiatives emerged from partnerships between education faculty and academic librarians, integrating digital and physical resources into teacher preparation. Evidence shows that librarians can serve as mentors for pre-service teachers during collaborative planning experiences. Teacher-librarians support less experienced pre-service teachers by posing clarifying questions, offering empathy and agreement, and serving as a sounding board for instructional ideas. Pre-service teachers "thrived on this type of partnership with the teacher-librarian as mentor for them," finding value in seeing librarians' perspective and learning about information literacy concepts through practical application (Luetkehans & Hunt, 2014; Witte, Gross & Latham, 2015; Association for Library and Information Science Education (ALISE), 2026).

Methodology

This study adopts a mixed-methods research design, combining quantitative and qualitative approaches to provide a comprehensive understanding of how libraries and librarians bridge the gap in enhancing digital literacy and inclusive education for pre-service teachers. The target population comprised pre-service teachers and librarians from 18 institutions across Nigeria, randomly selected. A total enumeration technique was employed where all 44 respondents from across these institutions were included in the study. Two primary instruments were developed for data collection - a questionnaire administered via Google Forms to collect quantitative data, and participant observation by the researchers using an Observation Checklist. The instruments explored perceptions, experiences, and challenges related to librarian-pre-service teacher communication and collaboration,

addressing themes such as communication frequency, collaborative experiences, and perceptions of librarian roles, digital literacy support, inclusive education contributions, barriers, and recommendations for improvement. The questionnaire was validated through face and content validation by three experts in library and information science and teacher education. It was pilot-tested to ensure clarity and appropriateness of questions. Descriptive statistics including frequencies, percentages, means, and standard deviations were employed in analysing the data via SPSS. The decision rule is: $\bar{x}$: 1.00 – 2.00 = low level, 2.01 – 3.00 = moderate level, 3.01 – 4.00 = high level.

Results and Discussion

The results and discussion are presented below:

Table 1: Demographic Information of Respondents (Major Variables Highlighted)

Demographic Variable	Category	Freq.	%
Institution	Emmanuel Alayande University of Education, Oyo	9	20.5
	Tai Solarin Federal University of Education	8	18.2
	Federal College of Education (Special), Oyo	4	9.1
	Federal College of Education, Abeokuta	4	9.1
	Others (14 institutions)	19	43.1
Section/Unit	Circulation / Readers' Services	11	25.0
	Cataloguing and Classification	7	15.8
	Electronic / Virtual Library / Digitization Unit	7	15.8
	Acquisition / Technical Services	6	13.6
	Others	13	29.8
Gender	Male	24	54.5
	Female	20	45.5
Marital status	Married	35	79.5
	Single	4	9.1
	Widowed	3	6.8
	Prefer not to say	2	4.5
Highest Educational Qualification	Master's Degree	23	52.3
	First Degree	10	22.7
	Ph.D.	10	22.7
	Diploma	1	2.3
Computer Use Experience	11–15 years	17	38.6
	6–10 years	10	22.7
	16–20 years	8	18.2
	21 years and above	6	13.6
	1–5 years	3	6.8
Work Experience	21 years and above	14	31.8
	11–15 years	12	27.3
	6–10 years	7	15.9

	16–20 years	6	13.6
	1–5 years	5	11.4
Current Work Designation	Librarian	29	65.9
	Library Officer	11	25.0
	University Librarian (UL)	3	6.8
	Deputy University Librarian (DUL)	1	2.3
Total		**44**	**100.0**

Table 1 shows that the respondents were drawn from a broad range of tertiary institutions in Nigeria, with Emmanuel Alayande University of Education, Oyo (20.5%) and Tai Solarin Federal University of Education (18.2%) contributing the largest proportions, suggesting stronger engagement with library technological practices in these institutions.

Participants were predominantly from Circulation/Readers' Services (25.0%), indicating that frontline service units are central to digital and information service delivery. Male respondents (54.5%) slightly exceeded females (45.5%), while the dominance of married participants (79.5%) reflects a relatively mature workforce. The high proportion of respondents with Master(s) Degrees (52.3%), alongside extensive computer use and work experience, implies a professionally competent and technologically exposed workforce capable of adapting to emerging library innovations. Furthermore, the predominance of librarians (65.9%) strengthens the credibility of the findings, as the responses largely reflect informed professional perspectives relevant to academic library operations and service delivery.

Table 2: Current practices in digital literacy and inclusive education

Statement	SD	D	A	SA	$\bar{x}$	St.D
I do run digital literacy session and workshops that pre-service teachers attend	3 6.8%	14 31.8%	22 50.0%	5 11.4%	2.66	.776
I co-plan information literacy task with education lectures	2 4.5%	8 18.2%	27 61.4%	7 15.9%	2.89	.722
I model inclusive search strategies	2 4.5%	7 15.9%	29 65.9%	6 13.6%	2.89	.689
I provide assistive technology and adapted spaces for pre-service teachers with support needs	3 6.8%	12 27.3%	23 52.3%	6 13.6%	2.73	.788
	2	12	25	5	2.75	.719

I curate open e-resources relevant to pre-service teacher training course works	4.5%	27.3%	56.8%	11.4%		
I teach pre-service teachers how to locate, evaluate and use information effectively	4 9.1%	4 9.1%	25 56.8%	11 25.0%	2.98	.849
I provide guidance on how to use library resources including databases	1 2.3%	3 6.8%	21 47.7%	19 43.2%	3.32	.708
I provide one-on-one research support to pre-service teachers	1 2.3%	6 13.6%	25 56.8%	12 27.3%	3.09	.709

Weighted mean of Current Practices in Digital Literacy and Inclusive Education = 2.91

Key: SD = Strongly disagree; D = Disagree; A = Agree; SA = Strongly agree; $\bar{x}$ = Mean; StD = Standard Deviation

Table 2 reveals a moderate level of current practices in digital literacy and inclusive education among librarians (weighted mean = 2.91). Respondents demonstrated stronger engagement in providing guidance on library resources and databases ($\bar{x}$ = 3.32) and offering one-on-one research support ($\bar{x}$ = 3.09), indicating a user-centred approach to information services. However, activities relating to digital literacy workshops, assistive technologies, and inclusive learning spaces remained moderate. This suggests that while librarians actively support pre-service teachers' information needs, institutional investment in inclusive digital infrastructure and collaborative instructional practices may still be inadequate. The results imply a need for enhanced capacity building and policy support to strengthen inclusive digital literacy initiatives in teacher education environments.

Table 3: Collaboration to provide digital literacy and inclusive education

Statement	SD	D	A	SA	$\bar{x}$	StD
Educators and librarians in my institution jointly design digital assignment for pre-service teachers	2 4.5%	10 22.7%	24 54.5%	8 18.2%	2.86	.765
Pre-service teachers regularly ask me for help with lesson planning technique	2 4.5%	14 31.8%	25 56.8%	3 6.8%	2.66	.680
Our library has a written policy linking digital literacy to inclusive teaching	2	17	17	8	2.70	.823

	4.5%	38.6%	38.6%	18.2%		
I help to integrate digital literacy into the teacher education curriculum	1 2.3%	14 31.8%	22 50.0%	7 15.9%	2.80	.734
I develop digital literacy frameworks and collaborating with teacher educators, produce frameworks that will align with programme goals and standards	2 4.5%	15 34.1%	23 52.3%	4 9.1%	2.66	.713
I offer professional development opportunities for pre-service teachers to enhance their digital literacy skills and knowledge	1 2.3%	7 15.9%	27 61.4%	9 20.5%	3.00	.682

Weighted mean of Collaboration = 2.78

Key: SD = Strongly disagree; D = Disagree; A = Agree; SA = Strongly agree; $\bar{x}$ = Mean; StD = Standard Deviation

Table 3 indicates a moderate level of collaboration in providing digital literacy and inclusive education among librarians and educators (weighted mean = 2.78). Respondents reported relatively strong involvement in offering professional development opportunities for pre-service teachers ($\bar{x}$ = 3.00) and jointly designing digital assignments with educators ($\bar{x}$ = 2.86). However, weaker ratings were observed in the development of institutional frameworks and policies linking digital literacy with inclusive teaching practices. This suggests that collaborative efforts exist largely at the operational level but remain insufficiently institutionalised. The results imply the need for stronger policy frameworks, curriculum integration strategies, and sustained interdisciplinary partnerships to enhance inclusive digital literacy practices within teacher education programmes.

Table 4: Types of digital literacy training provided in the libraries

Items	SD	D	A	SA	$\bar{x}$	SD
Information literacy programme such as data base searching and navigation	1 2.3%	4 9.1%	29 65.9%	10 22.7%	3.09	.640
Training on how to evaluate online sources for credibility and reliability	1 2.3%	5 11.4%	26 59.1%	12 27.3%	3.11	.689
Training on writing policies linking digital literacy to inclusive teaching	2 4.5%	13 29.5%	19 43.2%	10 22.7%	2.84	.834

Training on how to use digital tools for lesson planning and delivery	0 0.0%	10 22.7%	24 54.5%	10 22.7%	3.00	.682
Training on how to use multimedia resources into teaching practices	1 2.3%	8 18.2%	23 52.3%	12 27.3%	3.05	.746
Offering professional development opportunities for pre-service teachers to enhance their digital literacy skills and knowledge	1 2.3%	8 18.2%	28 63.6%	7 15.9%	2.93	.661
Training on effective online communication and e-mail etiquettes	1 2.3%	6 13.6%	28 63.6%	9 20.5%	3.02	.664
Engaging in Question & Answer sessions and discussion forum	3 6.8%	7 15.9%	23 52.3%	11 25.0%	2.95	.834
Training-of-Trainers programme to mentor digital Literacy trainers	1 2.3%	9 20.5%	26 59.1%	8 18.2%	2.93	.695

Weighted mean of Types of digital literacy training provided = 2.99

Key: SD = Strongly disagree; D = Disagree; A = Agree; SA = Strongly agree; $\bar{x}$ = Mean; SD = Standard Deviation

Table 4 shows a moderate to high level of digital literacy training provided in academic libraries (weighted mean = 2.99), with emphasis on information literacy instruction, database searching, and evaluation of online sources for credibility ($\bar{x}$ = 3.09 - 3.11). Training on multimedia integration, lesson planning tools, and online communication also recorded relatively strong ratings, indicating responsiveness to pedagogical needs. However, lower mean scores for policy development and training-of-trainers programmes suggest limited institutionalisation and sustainability of capacity-building initiatives. Overall, the findings imply that while libraries are actively engaged in practical digital literacy training for pre-service teachers, greater emphasis is required on strategic, policy-driven, and cascading training models to ensure long-term impact and scalability in teacher education contexts.

Table 5: Frequency of librarians' communication with pre-service teachers

	N	Oc	Of	VO	$\bar{x}$	StD
Conducting	4	21	15	4	2.43	.789

workshops and seminars	9.1%	47.7%	34.1%	9.1%		
One-on-one coaching	5 11.4%	10 22.7%	20 45.5%	9 20.5%	2.75	.918
E-mails	5 11.4%	5 11.4%	21 47.7%	13 29.5%	2.95	.939
Newsletter	7 15.9%	16 36.4%	18 40.9%	3 6.8%	2.39	.841
WhatsApp	4 9.1%	5 11.4%	13 29.5%	22 50.0%	3.20	.978
X	11 25.0%	14 31.8%	14 31.8%	5 11.4%	2.30	.978
TikTok	9 20.5%	19 43.2%	12 27.3%	4 9.1%	2.25	.892
Blogs	9 20.5%	22 50.0%	10 22.7%	3 6.8%	2.16	.834
LinkedIn	8 18.2%	15 34.1%	14 31.8%	7 15.9%	2.45	.975
Text messages	5 11.4%	7 15.9%	13 29.5%	19 43.2%	3.05	1.033
Presentations	5 11.4%	11 25.0%	21 47.7%	7 15.9%	2.68	.883
Institution website	4 9.1%	13 29.5%	20 45.5%	7 15.9%	2.68	.857
Library Noticeboards	6 13.6%	8 18.2%	14 31.8%	16 36.4%	2.75	.918

Weighted mean of Communication = 2.63

Key: N = Never; Oc = Occasionally; Of = Often; VO = Very often; $\bar{x}$ = Mean; StD = Standard Deviation

Table 5 indicates a moderate level of communication between librarians and pre-service teachers (weighted mean = 2.63), with interaction occurring more through informal and digital channels than structured academic engagements. WhatsApp ($\bar{x}$ = 3.20) and text messaging ($\bar{x}$ = 3.05) were the most frequently used

platforms, reflecting a shift toward mobile-based communication. In contrast, traditional scholarly communication tools such as blogs, newsletters, and social media platforms recorded lower usage. Workshops and seminars also showed relatively limited frequency ($\bar{x}$ = 2.43), suggesting weak formal engagement. Overall, the results imply that communication is largely convenience-driven rather than pedagogically structured, underscoring the need for institutional frameworks that strengthen academic communication channels to enhance sustained digital literacy and inclusive educational support.

Table 6: Challenges in collaborating with teacher educators for digital literacy development

	SD	D	A	SA	$\bar{x}$	StD
Conflict of interest	3	8	25	8	2.86	.795
	6.8%	18.2%	56.8%	18.2%		
Teacher educators looking down on librarians assuming them to be only bookkeepers	1	8	20	15	3.11	.784
	2.3%	18.2%	45.5%	34.1%		
Ineffective communication channels	1	9	29	5	2.86	.632
	2.3%	20.5%	65.9%	11.4%		
Competitive priorities and most often resistance to change	2	4	33	5	2.93	.625
	4.5%	9.1%	75.0%	11.4%		
Inadequate access due to the lack of Internet connectivity	5	5	24	10	2.89	.895
	11.4%	11.4%	54.5%	22.7%		
Inability to keep up with the emerging technologies	2	6	25	11	3.02	.762
	4.5%	13.6%	56.8%	25.0%		
Integrating digital literacy into the existing curriculum	1	6	29	8	3.00	.647
	2.3%	13.6%	65.9%	18.2%		

Weighted mean of Challenges in collaborating with teacher educators = 2.96

Key: SD = Strongly disagree; D = Disagree; A = Agree; SA = Strongly agree; $\bar{x}$ = Mean; StD = Standard Deviation

Table 6 reveals a moderate level of perceived challenges in collaboration between librarians and teacher educators for digital literacy development (weighted mean = 2.96). The most prominent constraint was the perception of librarians as mere bookkeepers by teacher educators ($\bar{x}$ = 3.11), indicating professional identity tensions that may hinder collaboration. Other notable challenges included inability

to keep pace with emerging technologies ($\bar{x}$ = 3.02) and difficulties in integrating digital literacy into existing curricula ($\bar{x}$ = 3.00).

Although issues such as inadequate internet access, conflict of interest, and ineffective communication were acknowledged, they were comparatively less pronounced. These results imply that strengthening interdisciplinary respect, technological capacity, and institutional curriculum alignment is essential for improving sustainable collaboration in digital literacy and inclusive education.

Table 7: Opportunities to support pre-service teachers among librarians

	SD	D	A	SA	$\bar{x}$	StD
Collaborating with educators to support the integration of information literacy instruction into the curriculum	0 0.0%	1 2.3%	23 52.3%	20 45.5%	3.43	.545
Providing pre-service teachers with research skills necessary to effectively use educational resources	0 0.0%	2 4.5%	25 56.8%	17 38.6%	3.34	.568
Assisting pre-service teachers in finding and evaluating resources to support their lesson plan	0 0.0%	2 4.5%	26 59.1%	16 36.4%	3.32	.561
Development of mentorship programmes for pre-service teachers	0 0.0%	3 6.8%	23 52.3%	18 40.9%	3.34	.608
Creating dedicated library spaces for pre-service teachers to study, collaborate and access resources	0 0.0%	2 4.5%	23 52.3%	19 43.2%	3.39	.579
Developing virtual learning environment that would enable pre-service teachers have access to e resources	0 0.0%	1 2.3%	25 56.8%	18 40.9%	3.39	.538
Integrating digital literacy into the existing curriculum	0 0.0%	2 4.5%	24 54.5%	18 40.9%	3.36 3.43	.574 .545

Weighted mean of Opportunities to support pre-service teachers = 3.37

Key: SD = Strongly disagree; D = Disagree; A = Agree; SA = Strongly agree; $\bar{x}$ = Mean; StD = Standard Deviation

Table 7 indicates a high level of perceived opportunities for librarians in supporting pre-service teachers' digital literacy development (weighted mean = 3.37). Respondents strongly affirmed collaborative curriculum integration of information literacy ($\bar{x}$ = 3.43) and the provision of research skills support, resource evaluation, and mentorship programmes ($\bar{x}$ = 3.32 - 3.39). Similarly, the creation of dedicated study spaces and virtual learning environments received consistently high ratings, reflecting strong institutional readiness for learner support. These results suggest that librarians are strategically positioned as key academic partners in teacher education. The implications point to the need for policy consolidation and sustained investment in library-based instructional support systems to fully harness these opportunities for enhancing digital literacy and inclusive education outcomes.

Discussion of Findings

Libraries and librarians play a critical role in bridging the gap in enhancing digital literacy and inclusive education for pre-service teachers. The systematic review reveals that librarians can provide targeted support and training to pre-service teachers, enabling them to effectively integrate technology into their teaching practices and promote inclusive education (Yelwa, 2024). The participant observation reveals that librarians work closely with pre-service teachers to support their development of digital literacy and inclusive education skills. The observation also reveals that librarians provide pre-service teachers with access to digital resources and tools that can support inclusive education (American Library Association, 2019). It is revealed that librarians perceive their role as critical in supporting pre-service teachers' development of digital literacy and inclusive education skills.

The finding reveals a moderate level of current practices in digital literacy and inclusive education among librarians. Respondents demonstrated stronger engagement in providing guidance on library resources and databases and offering one-on-one research support, indicating a user-centred approach to information services. This finding corroborates the position of Osinulu (2021) and Okeji *et al*. (2020), who reported that librarians in Nigerian institutions possessed high levels of digital literacy proficiency and were actively engaged in supporting users.

However, activities relating to digital literacy workshops, assistive technologies and inclusive learning spaces remained moderate. This suggests that while librarians actively support pre-service teachers' information needs,

institutional investment in inclusive digital infrastructure and collaborative instructional practices may still be inadequate. This finding is consistent with Yelwa (2024), who noted that libraries and librarians bridge digital divides by providing equitable technology access and curating accessible digital resources, but also acknowledged that systemic barriers often hinder the full realisation of these efforts.

The results imply a need for enhanced capacity building and policy support to strengthen inclusive digital literacy initiatives in teacher education environments. The moderate rating for co-planning information literacy tasks with education lecturers further suggests that collaboration remains largely informal rather than structurally embedded, echoing the concerns of Green and Chassereau (2023) and Giles, Baker, and Willis (2024) that librarian-teacher communication is predominantly transactional.

The result on collaboration indicates a moderate level of collaboration in providing digital literacy and inclusive education among librarians and educators. Respondents reported relatively strong involvement in offering professional development opportunities for pre-service teachers and jointly designing digital assignments with educators. This finding supports the assertion of Clarke, Kretz, and Fena (2025) that when librarians partner with classroom teachers as co-educators, students' achievements improve significantly, especially in areas requiring critical information engagement and digital literacy skills.

Nevertheless, weaker ratings were observed in the development of institutional frameworks and policies linking digital literacy with inclusive teaching practices for developing digital literacy frameworks; for written policy linking digital literacy to inclusive teaching). This suggests that collaborative efforts exist largely at the operational level but remain insufficiently institutionalised. This finding aligns with the observations of Smith (2023), Ijoko (2025), and Mourão and Pereira (2026), who identified institutional barriers such as lack of structured pathways for librarians to assume teaching roles, lack of shared planning time, and fragmented professional learning routes as significant obstacles to effective collaboration.

The moderate rating for pre-service teachers regularly asking librarians for help with lesson planning techniques suggests that pre-service teachers may not fully understand or appreciate the instructional role of librarians. This corroborates the finding of Moreillon (2014) that communication was largely confined to in-class work sessions, with

little to no contact occurring outside of structured meeting times, and that even when librarians-initiated efforts occurred to establish communication, these attempts often failed to yield sustained dialogue. The results imply the need for stronger policy frameworks, curriculum integration strategies, and sustained interdisciplinary partnerships to enhance inclusive digital literacy practices within teacher education programmes.

The result on types of digital literacy training provided in libraries shows a moderate level, with emphasis on information literacy instruction, database searching, and evaluation of online sources for credibility. This finding is in collaboration with Osinulu (2021), Endouware and Dushu (2021), and Rathod and Girish (2025), who reiterated that librarians train pre-service teachers on information retrieval, critical evaluation, copyright, and the integration of digital tools into pedagogy. Training on multimedia integration, lesson planning tools, and online communication also recorded relatively strong ratings, indicating responsiveness to pedagogical needs. This aligns with Xiao, Wang, and Li (2025), who noted that librarians guide pre-service teachers in blending traditional reading practices with digital tools, including selected AI applications, to create engaging learning experiences that appeal to diverse student learning profiles.

This finding resonates with the observation of Oyelude (2026) that in Nigeria, while librarians provide fundamental digital literacy instruction, the trainers frequently rely on self-sponsorship and trial-and-error to learn. The results imply that while libraries are actively engaged in practical digital literacy training for pre-service teachers, greater emphasis is required on strategic, policy-driven, and cascading training models to ensure long-term impact and scalability in teacher education contexts.

In addition, a moderate level of communication between librarians and pre-service teachers was recorded, with interaction occurring more through informal and digital channels than structured academic engagements. WhatsApp and text messaging were the most frequently used platforms, reflecting a shift toward mobile-based communication. This finding is consistent with the observation of Efe (2023) and Oyelude and Okere (2022) that the COVID-19 pandemic demonstrated the critical need for librarian-teacher collaboration, as librarians proved instrumental in supporting remote learning and providing blended learning opportunities.

In contrast, traditional scholarly communication tools such as blogs, newsletters and social media platforms like TikTok and Twitter (X) recorded lower usage. Workshops and seminars also showed relatively limited frequency, suggesting weak formal engagement. This finding aligns with Green and Chassereau (2023) and Giles, Baker, and Willis (2024), who found that librarian-pre-service teacher communication is predominantly transactional and focused on resource acquisition, rather than pedagogical partnership particularly during lesson planning. The moderately higher frequency of one-on-one coaching and library noticeboards suggests that some personalised and physical communication channels remain relevant. This underscores the need for institutional frameworks that strengthen academic communication channels to enhance sustained digital literacy and inclusive educational support. The finding also supports the assertion of Yelwa (2024) that communication frequency remains a significant variable affecting pre-service teacher preparedness.

The survey also reveals that librarians face challenges (Atchrimi and Ogunbodede (2024) in supporting pre-service teachers' development, including limited time and resources (Smith, 2023; Ijoko, 2025; Mourão & Pereira, 2026). The findings of this study highlight the critical role that libraries and librarians play in bridging the gap in enhancing digital literacy and inclusive education for pre-service teachers. The study's results have implications for the development of library services and programs that support pre-service teachers, as well as for the education of librarians themselves.

The study showed that the most prominent constraint was the perception of librarians as mere bookkeepers by teacher educators, indicating professional identity tensions that may hinder collaboration. This finding collaborates with the studies of Smith (2023), Ijoko (2025), and Mourão and Pereira (2026), who identified institutional barriers such as inadequate electronic resources, lack of library commitment from administration, insufficient technological infrastructure, lack of shared planning time, and lack of structured pathways for librarians to assume teaching roles. Additional notable challenges included inability to keep pace with emerging technologies and difficulties in integrating digital literacy into existing curricula.

The challenge of keeping up with emerging technologies is particularly significant in the Nigerian context, where Oyelude (2026) noted that librarians frequently rely on self-sponsorship and trial-and-error to learn. This finding also resonates with Khan (2020), who reported

that library professionals in Pakistan were neither motivated to enhance their current level of digital literacy skills nor able to acquire these skills due to the unavailability of training facilities and the presence of other barriers such as inadequate infrastructure, lack of interest, and technophobia.

These results imply that strengthening interdisciplinary respect, technological capacity, and institutional curriculum alignment is essential for improving sustainable collaboration in digital literacy and inclusive education. The findings also suggest that without institutional recognition and structured pathways, librarians cannot be effectively integrated into teaching structures for digital literacy development and for effective performance of pre-service teachers.

Result on opportunities indicates a high level of perceived opportunities for librarians in supporting pre-service teachers' digital literacy development. Respondents strongly affirmed collaborative curriculum integration of information literacy and the provision of research skills support, resource evaluation, and mentorship programmes. Similarly, the creation of dedicated study spaces and virtual learning environments received consistently high ratings, reflecting strong institutional readiness for learner support.

These findings align with Edwards (2025), who noted that online professional learning communities that include pre-service teachers, cooperating teachers, university faculty, and school librarians provide a solid foundation for professional development and future collaborations. The high rating for collaborative curriculum integration also supports the position of Clarke, Kretz, and Fena (2025) that the conceptual foundation for librarian-teacher collaboration rests on the instructional partnership model, wherein librarians function as co-teachers rather than supplementary resources. The strong affirmation of mentorship programmes resonates with the findings of Luetkehans and Hunt (2014), Witte, Gross, and Latham (2015), and the Association for Library and Information Science Education (2026), who found that pre-service teachers "thrived on this type of partnership with the teacher-librarian as mentor for them," finding value in seeing librarians' perspective and learning about information literacy concepts through practical application

Limitations

This study has several limitations. First, the study's sample size was limited to librarians working with pre-service teachers in selected teacher education

programmes. Future studies should aim to recruit a larger and more diverse sample of librarians. Second, the study's data collection methods were limited to surveys and interviews. Future studies should consider using additional data collection methods, such as document analysis.

Conclusion

This study has demonstrated that libraries and librarians play a vital, though often underutilized, role in enhancing digital literacy and inclusive education for pre-service teachers in Nigeria. While librarians actively provide research support, guidance on library resources, and digital literacy training, their potential as instructional partners in teacher preparation remains largely untapped. Systemic challenges, including limited collaboration frameworks, inadequate technological infrastructure, and narrow perceptions of librarians' roles, hinder the optimal contribution of libraries to pre-service teacher preparation.

Addressing these challenges requires institutional commitment, policy reform, and a shift in professional culture to recognize librarians as essential instructional partners. As teacher education increasingly prioritizes digital literacy and inclusive education, the collaboration between librarians and teacher educators becomes not just beneficial but essential. By bridging the gap between libraries and teacher preparation, institutions can ensure that pre-service teachers are equipped with the digital literacy competencies and inclusive education practices necessary for twenty-first-century classrooms. The findings of this study contribute to the growing body of knowledge on librarian-teacher collaboration and provide a foundation for future interventions and research aimed at strengthening the role of libraries in teacher preparation. Ultimately, the success of this endeavour depends on the collective commitment of librarians, teacher educators, institutional leaders, and policymakers to recognize and actualize the instructional potential of libraries in shaping the future of teachers.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Libraries and librarians should provide targeted support and training to pre-service teachers to enhance their digital literacy and inclusive education skills.
2. Teacher education programmes should collaborate with libraries and librarians to integrate digital literacy and inclusive education into the curriculum.
3. Libraries and librarians should provide pre-service teachers with access to digital resources and

tools that can support inclusive education.

4. Librarians should be educated and trained to support pre-service teachers' development of digital literacy and inclusive education skills.
5. There is the need for librarians to expand their training programmes to include emerging areas such as artificial intelligence, data literacy, digital citizenship, and inclusive teaching practices. Training should be structured, assessed, and aligned with teacher education programme goals
6. Further research should be conducted to examine the impact of librarian-led digital literacy instruction on pre-service teachers' teaching practices and student learning outcomes.

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