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Research paper

Lived Experiences of Pre-service Economics Teachers with Technology and AI Integration at Olabisi Onabanjo University, Ogun State, Nigeria

David I. O Ojo *, Folashade Grace David, Abdullahi Omolade Akindele

St. Augustine College of Education, NIGERIA

***Corresponding Author:** iamitopaojo@gmail.com

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ABSTRACT

The rapid integration of technology and artificial intelligence (AI) into educational practice has created both opportunities and challenges for pre-service teachers in Nigerian higher education institutions. While quantitative studies have examined predictors of AI usability and technological adaptation among pre-service teachers, few studies have explored the subjective, lived experiences of pre-service economics teachers navigating this technological transformation. This single-institution study investigated the lived experiences of 300-level Economics Education pre-service teachers at Olabisi Onabanjo University (OOU), Ago-Iwoye, Ogun State, Nigeria, regarding technology and AI integration in their teaching and learning. The study adopted a phenomenologically oriented qualitative design: ten participants were purposively selected from 300-level Economics Education students at OOU who had meaningful experience with technology and AI tools in their academic preparation; data were collected through semi-structured in-depth interviews and analysed using Braun and Clarke's (2006) thematic analysis procedure. Five interconnected themes emerged: navigating the promise and challenge of AI tools in learning, factors shaping technology adoption and confidence, the pedagogical gap between digital knowledge and classroom application, social and institutional dimensions of technology integration, and envisioning a digitally responsive economics teacher education. The findings reveal that while these pre-service economics teachers acknowledge the transformative potential of AI and digital tools, they experience significant challenges related to infrastructure, self-efficacy, pedagogical preparation, and institutional support that mediate the quality of their technological engagement. Infrastructural barriers concerned digital technology in general, whereas enthusiasm about analytic potential and concern about intellectual shortcuts related specifically to AI tools. Because the study draws on ten participants from one university, the findings are specific to the OOU context and are not intended to be generalised to all pre-service economics teachers in Ogun State. The study concludes that a holistic approach integrating technological training, institutional support, and subject-specific pedagogical development is essential for preparing economics teachers at OOU, and in comparable institutions, for the demands of twenty-first century classrooms.

Keywords: pre-service economics teachers, technology integration, artificial intelligence, teaching and learning, phenomenologically oriented qualitative study, Olabisi Onabanjo University

The integration of technology and artificial intelligence (AI) into education represents one of the most transformative developments in contemporary pedagogy. Across the globe, educational institutions are investing in digital infrastructure, AI-powered learning management systems, and technology-enhanced pedagogical

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approaches that fundamentally alter how teaching and learning occur (Selwyn, 2019). For teacher education, this transformation raises critical questions about how pre-service teachers are being prepared to navigate, utilise, and critically evaluate digital tools in their future classrooms (Ogundipe & Oyewole, 2025). These questions are particularly significant for pre-service economics teachers, whose subject matter increasingly intersects with data analysis, digital financial literacy, and AI-driven economic modelling.

In Nigeria, the adoption of technology in education has accelerated considerably in recent years, driven by policy reforms, institutional investments in digital infrastructure, and the widespread penetration of mobile technology among young people. Universities and faculties of education, which serve as primary training grounds for pre-service teachers at the degree level, have introduced digital tools, online learning platforms, and AI applications into their curricula, although significant disparities remain in the quality and consistency of technology integration across institutions, departments, and individual student experiences (Eze, Chinedu-Eze & Bello, 2018). Pre-service economics teachers occupy a particularly complex position in this landscape, as they must simultaneously develop content knowledge in economics, pedagogical skills, and technological competencies that will enable them to prepare students for a rapidly digitising economic world.

Olabisi Onabanjo University (OOU), Ago-Iwoye, located in Ogun State, southwestern Nigeria, is one of the state universities preparing pre-service economics teachers through its Faculty of Education. As an institution that serves a large and diverse student population in a state undergoing rapid technological and economic transformation, OOU presents a significant context for examining how pre-service economics teachers at the 300 level experience the integration of technology and AI in their academic lives. At this level, students are expected to demonstrate increasing command of economics content, engage with research tools, and develop instructional strategies that will characterise their future classroom practice. This is precisely the stage at which the integration of technological, pedagogical, and content knowledge described by Koehler and Mishra (2009) becomes practically relevant.

Research has consistently demonstrated that teachers' beliefs about technology, their confidence in using it, and the support available within their institutions are among the most important determinants of meaningful technology integration (Ertmer & Ottenbreit-Leftwich, 2010; Tondeur et al., 2012). Studies among Nigerian pre-service teachers have further shown that technological proficiency and virtual collaboration predict global adaptability (Ogundipe & Oyewole, 2025), and that social media usage predicts global economic awareness among pre-service economics teachers (Abiodun & Oyewole, 2025). However, the majority of this research has been conducted using quantitative methodologies that, while valuable in identifying statistical predictors, do not capture the depth, texture, and meaning of pre-service teachers' actual experiences with technology and AI in their daily lives as learners and emerging educators (Creswell & Poth, 2018).

The COVID-19 pandemic served as a significant accelerant in this process, compelling pre-service teachers across Nigeria to engage with digital platforms and online learning tools in ways that were previously peripheral to their academic experience (Adedoyin & Soykan, 2023). For pre-service economics teachers at OOU, this period introduced novel encounters with AI-driven learning platforms, virtual collaboration tools, and digital research resources that reshaped their understanding of what technology could offer in an educational context. Yet the pandemic also exposed the fragility of digital infrastructure, the inequalities in access to reliable internet and devices, and the psychological demands of navigating unfamiliar technological environments under conditions of significant stress and uncertainty (Mishra et al., 2020).

It is against this backdrop that the present study sought to explore the lived experiences of 300-level Economics Education pre-service teachers at Olabisi Onabanjo University, Ago-Iwoye, Ogun State, regarding technology and AI integration in their teaching and learning. The study examined participants' perceptions of AI and digital tools, the factors that shape their technological confidence and engagement, the relationship between digital knowledge and actual pedagogical application, the social and institutional dimensions of technology integration, and their vision for a digitally responsive economics teacher education.

Research Questions

The study was guided by the following research questions, from which the interview guide was directly developed:

RQ1: How do 300-level Economics Education pre-service teachers at OOU perceive and experience AI tools in their economics learning?

RQ2: What individual, social, and structural factors shape their confidence in, and adoption of, technology and AI?

RQ3: How do participants describe the relationship between their personal digital knowledge and their capacity to apply it pedagogically in economics classrooms?

RQ4: What social and institutional dimensions shape participants' experiences of technology integration at OOU?

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RQ5: What do participants envision as necessary for a digitally responsive economics teacher education?

LITERATURE REVIEW

Technology integration in economics teacher education

The role of technology in economics education has evolved considerably over the past two decades, moving from supplementary tools for data presentation to integrated platforms for simulation, data analysis, and AI-assisted pedagogical support. Globally, researchers have documented how digital technologies transform the delivery of economics content, enabling richer engagement with real-world data, interactive modelling of economic phenomena, and collaborative inquiry that extends beyond the physical classroom (Voogt et al., 2018). For teacher education programmes, this evolution creates an imperative to ensure that pre-service economics teachers graduate with not only strong content knowledge but also the technological competencies required to leverage these tools effectively in secondary school settings.

In the Nigerian context, economics education has traditionally been delivered through lecture-based approaches with limited integration of technology or real-world data analysis. This challenge extends to core macroeconomic content itself: research on pre-service teachers' perceptions of monetary policy and inflation dynamics in colleges of education in Ogun State found that pre-service teachers often hold incomplete or fragmented understandings of these concepts, underscoring the need for technology-supported pedagogical approaches that can make abstract macroeconomic relationships more concrete and analysable (Ojo, David & Agwu, 2026). The Technological Pedagogical Content Knowledge (TPACK) framework, developed by Koehler and Mishra (2009), provides a useful conceptual lens for understanding the intersection of content knowledge, pedagogical knowledge, and technological knowledge that economics teacher education must address. The framework argues that effective technology integration is not merely additive but requires teachers to develop an integrated understanding of how technology transforms both content and pedagogy.

As economic analysis becomes increasingly dependent on computational tools, AI-driven data processing, and digital modelling platforms, pre-service economics teachers who lack facility with these tools face significant limitations in their capacity to prepare students for the demands of contemporary economic life. Ertmer and Ottenbreit-Leftwich (2010) argue that teachers' beliefs about technology, rather than access alone, are the most powerful determinants of technology integration quality, a finding with direct implications for understanding how pre-service economics teachers at OOU engage with AI and digital tools.

Artificial intelligence in teaching and learning

Artificial intelligence has rapidly become a significant presence in educational environments worldwide, offering tools for personalised learning, automated assessment, intelligent tutoring systems, and administrative efficiency (Roll & Wylie, 2016). For teacher education, AI presents both significant opportunities and complex challenges. AI tools can provide pre-service teachers with access to adaptive learning platforms that respond to their individual learning needs, vast databases of pedagogical resources, and real-time feedback mechanisms that support skill development. On the other hand, the integration of AI in teacher education raises important questions about critical engagement, pedagogical authenticity, and the risk of uncritical dependence on algorithmic outputs, concerns that intensify as digital literacy and institutional support shape how effectively pre-service teachers engage with AI tools in practice.

Holmes et al. (2019) argue that AI in education must be approached critically, with attention to the ethical dimensions of algorithmic decision-making, data privacy, and the risk of reinforcing existing educational inequalities. These concerns are particularly relevant in the Nigerian context, where unequal access to reliable internet, devices, and electricity shapes who can benefit from digital learning (UNESCO, 2023), and where infrastructural constraints have been found to limit the use of e-learning facilities in universities (Eze, Chinedu-Eze & Bello, 2018).

AI integration in specific subject areas requires not only generic digital competence but also disciplinary understanding of how AI tools can be meaningfully aligned with the conceptual structures, pedagogical traditions, and learning objectives of particular subject areas. Zawacki-Richter et al. (2019), in a systematic review of AI applications in higher education, found that personalised learning and predictive analytics are among the most prominent AI applications in university settings, highlighting the potential relevance of AI tools for the kind of data-driven economic analysis central to Economics Education.

International literature on AI in teacher education also increasingly emphasises critical AI literacy and digital inequality as necessary companions to technical competence. UNESCO's (2023) global education monitoring report cautions that the rapid uptake of digital technology in education can deepen existing inequalities unless deliberately governed in the interests of learners, a caution that applies directly to AI tools whose availability and quality of use often depend on reliable connectivity and device access. Scholarship on AI in education likewise

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argues that pre-service teachers require not only the ability to operate digital and AI tools but also the capacity to evaluate their pedagogical appropriateness, question their outputs, and adapt them to local curricular and infrastructural realities, rather than adopting them uncritically (Holmes et al., 2019). These international perspectives on critical AI literacy and digital inequality provide an important counterpart to the Nigerian-specific literature reviewed above, situating the experiences of OOU's pre-service Economics teachers within a broader global conversation about who benefits from, and who is left behind by, AI integration in teacher education.

Digital literacy and technological self-efficacy among pre-service teachers

Digital literacy and technological self-efficacy are among the most extensively studied predictors of technology adoption in teacher education. Digital literacy encompasses not only the basic ability to use digital devices and platforms but also the critical capacity to evaluate, create, and communicate through digital media in ways that support learning and professional practice (Eshet-Alkalai, 2004). Technological self-efficacy refers to individuals' beliefs in their own capacity to use technology effectively to accomplish specific tasks, and has been consistently identified as a strong predictor of both technology adoption and the quality of technology-integrated practice among educators (Bandura, 1997).

In the Nigerian context, studies have found that pre-service teachers' technological proficiency and virtual collaboration skills are significant predictors of their capacity for global adaptability (Ogundipe & Oyewole, 2025). Social media usage has also been identified as a predictor of global economic awareness among pre-service economics teachers (Abiodun & Oyewole, 2025). Internationally, Tondeur et al. (2012), in a synthesis of qualitative evidence from nineteen studies, identified preparation strategies such as teacher educators modelling technology use, learning technology by design, and authentic technology experiences, together with institutional conditions such as technology planning, leadership, and staff training, as central to preparing pre-service teachers for technology integration. Building on that synthesis, Tondeur et al. (2016) developed and validated an instrument measuring pre-service teachers' perceptions of six support strategies: role models, reflection, learning by design, collaboration with peers, authentic experiences, and feedback. These studies provide an important international evidence base against which to situate the experiences of OOU students.

Classroom diversity and inclusive teaching practice place additional demands on pre-service teachers' technological adaptation, particularly given variation in learners' access to devices, connectivity, and prior digital exposure. This has particular relevance for economics teacher education at OOU, where the integration of technology must accommodate students with varied learning styles, socioeconomic backgrounds, and levels of prior digital exposure. Mishra et al. (2020) observed that the pandemic period created both barriers and opportunities for technology adoption in higher education, as institutions were forced to rapidly develop digital instructional capacity, and many students developed significant technology skills under conditions of necessity.

Institutional support and technology adoption

Institutional support has been identified as a critical mediating factor in the relationship between individual technological competence and actual technology adoption in educational practice. In the Nigerian higher education context, the availability of digital infrastructure and the level of institutional support have been found to shape how e-learning facilities are used (Eze, Chinedu-Eze & Bello, 2018). Ertmer and Ottenbreit-Leftwich (2010) argue that technology integration depends not only on access but also on the culture of the institutions in which teachers learn and work, including how technology use is modelled and supported. Similarly, Tondeur et al.'s (2012) synthesis identifies institution-level conditions, such as technology planning and leadership, collaboration within and between institutions, and the training of teacher educators, as necessary for the effective technology preparation of pre-service teachers.

Conversely, inadequate institutional support creates conditions in which individual motivation and digital competence are insufficient to overcome structural barriers to effective technology use. Eze, Chinedu-Eze and Bello (2018), examining the utilisation of e-learning facilities in a Nigerian university, reported that infrastructural and institutional constraints limited the effective use of these facilities, indicating that structural conditions constrain technology use even where individual motivation is present. These findings have direct relevance to understanding the OOU context.

The relationship between media literacy, peer collaboration, and civic engagement among pre-service teachers also has implications for technology integration in education (Oyewole, 2026). Pre-service teachers who are critical consumers and producers of digital media are better positioned to evaluate and integrate AI tools in educationally meaningful ways. Selwyn (2019) cautions, however, that media literacy alone is insufficient without structural conditions that enable critical engagement with technology; digital competence developed in resource-constrained environments may be narrower and more instrumental than that developed with full institutional support and diverse technological exposure.

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Theoretical framework

This study is guided by three complementary theoretical perspectives operating at different levels of the research: phenomenological philosophy, which provides the philosophical and methodological orientation of the study; the Technology Acceptance Model (TAM), which offers an interpretive lens for the attitudinal and perceptual dimensions of participants' accounts; and the Technological Pedagogical Content Knowledge (TPACK) framework, which informs the study's attention to the pedagogical, subject-specific dimensions of technology and AI integration that surface in the literature review and discussion. These three perspectives are not treated as equivalent or competing explanations of the same phenomenon; rather, phenomenology governs how the data were generated and interpreted as first-person accounts of experience, while TAM and TPACK function as sensitising concepts that helped the researcher identify and organise recurring patterns of meaning within those accounts, particularly around technology acceptance and pedagogical application. Husserl's phenomenological approach, as elaborated by Creswell and Poth (2018), provides the philosophical foundation for the study's focus on the lived experiences of pre-service economics teachers, emphasising the importance of understanding how phenomena such as technology and AI integration are subjectively experienced and interpreted from the first-person perspective. Van Manen (1990) further articulates phenomenology as a research orientation that returns to lived experience as the primary source of knowledge about human phenomena, making it particularly suited to investigating how 300-level students at OOU make sense of their encounters with technology and AI.

The Technology Acceptance Model, as developed by Davis (1989) and extended by Venkatesh and Bala (2008), provides a framework for understanding the cognitive and attitudinal dimensions of technology adoption. TAM posits that perceived usefulness and perceived ease of use are the primary determinants of technology acceptance, and has been applied extensively in educational research to understand how teachers and students engage with digital tools, including AI applications. This model provides a useful quantitative counterpart to the attitudinal and perceptual dimensions of technology adoption that the present study explores qualitatively.

The Technological Pedagogical Content Knowledge (TPACK) framework, developed by Koehler and Mishra (2009), complements phenomenology and TAM by directing attention to the specifically pedagogical and disciplinary dimensions of technology integration: the intersection of participants' economics content knowledge, their pedagogical knowledge, and their technological knowledge. Where TAM helps explain why participants accept or resist particular tools, TPACK helps explain why technological competence as a learner does not automatically translate into the capacity to design technology-integrated economics lessons, a gap that emerged strongly in the findings (see Theme 3). TPACK is therefore used analytically rather than as a design framework for data collection; it provided a conceptual vocabulary for interpreting participants' accounts of the distance between their personal digital competence and their pedagogical readiness.

Together, these three theoretical perspectives enable the study to investigate not only what 300-level Economics Education pre-service teachers do with technology and AI but how they make sense of and assign meaning to their technological experiences, why they accept or resist particular tools, and why digital competence does not automatically translate into pedagogical readiness.

METHODOLOGY

Research design

This study adopted a phenomenologically oriented qualitative design, in which a phenomenological orientation to lived experience was combined with a systematic thematic analysis procedure. Phenomenology is concerned with exploring the essence of lived experiences as perceived and described by individuals who have undergone a particular phenomenon (Creswell & Poth, 2018). This design was appropriate because the study sought to understand the subjective experiences, perceptions, and meaning-making processes of pre-service economics teachers regarding technology and AI integration in their teaching and learning, rather than to measure or statistically predict technological behaviour. Van Manen's (1990) hermeneutic phenomenology informed the study's orientation to lived experience: the emphasis on attending closely to the meaning structures embedded in participants' own descriptions, rather than reducing their accounts to predetermined categories, shaped how interview questions were framed and how the researcher listened for meaning during data collection. The study does not, however, claim to apply the full hermeneutic-phenomenological analytic procedure in the sense of a dedicated existential or structural analysis of essences; the actual coding and analysis of the resulting data followed Braun and Clarke's (2006) thematic analysis procedure (detailed in Section 3.5). Van Manen's phenomenology is therefore best understood as shaping the study's design and interpretive stance, while Braun and Clarke's approach supplied the systematic analytic procedure applied to the data; the study is consequently more accurately described as a phenomenologically oriented qualitative thematic study rather than a hermeneutic-phenomenological analysis in the strict Van Manen sense. This combination enabled the researcher to explore the depth and complexity of

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participants' experiences, attending carefully to the meanings they assign to their encounters with digital tools and AI, while retaining a transparent and replicable analytic procedure.

Study setting and participants

The study was conducted in the Department of Social Science Education, Faculty of Education, Olabisi Onabanjo University (OOU), Ago-Iwoye, Ogun State, Nigeria. OOU was selected as the study setting because it is a well-established state university in Ogun State with an active Economics Education programme that prepares pre-service teachers for secondary school deployment across southwestern Nigeria. The university's Faculty of Education provides an information-rich context for investigating technology and AI integration in economics teacher education, as it serves a sizeable student population drawn from diverse socioeconomic and geographic backgrounds within the state and beyond.

Participants consisted of ten 300-level Economics Education pre-service teachers enrolled in the Social Science Education programme at OOU who had meaningful experience with technology and AI tools in their academic preparation. The 300 level was specifically targeted because students at this stage have completed foundational coursework in economics content and pedagogy, are increasingly engaged with research tools and independent learning, and are approaching their teaching practice placements, making their experiences of technology and AI integration particularly relevant to understanding the interface between their academic formation and future professional practice. Participants ranged in age from 20 to 26 years. A demographic profile of participants is presented in **Table 1**.

Table 1

Demographic profile of participants

Participant	Age	Gender	Level	Institution	Programme	Prior Tech Experience	Years of AI Use
P1	20	Female	300 Level	OOU, Ago-Iwoye	Economics Education	Moderate	1 year
P2	22	Male	300 Level	OOU, Ago-Iwoye	Economics Education	High	2 years
P3	21	Female	300 Level	OOU, Ago-Iwoye	Economics Education	Low	1 year
P4	23	Male	300 Level	OOU, Ago-Iwoye	Economics Education	Moderate	1 year
P5	24	Female	300 Level	OOU, Ago-Iwoye	Economics Education	High	2 years
P6	20	Female	300 Level	OOU, Ago-Iwoye	Economics Education	Low	Less than 1 year
P7	26	Male	300 Level	OOU, Ago-Iwoye	Economics Education	High	3 years
P8	21	Female	300 Level	OOU, Ago-Iwoye	Economics Education	Low	Less than 1 year
P9	25	Male	300 Level	OOU, Ago-Iwoye	Economics Education	Moderate	2 years
P10	22	Female	300 Level	OOU, Ago-Iwoye	Economics Education	Moderate	1 year

Sampling technique

Purposive sampling was employed to select participants who possessed direct and meaningful experience with the phenomenon under investigation. This sampling technique is considered appropriate in phenomenologically oriented qualitative research because it enables the researcher to identify information-rich participants whose experiences align closely with the study's objectives (Patton, 2015). Participants were recruited through the Department of Social Science Education at OOU, with assistance from course advisers and peer referrals within the 300-level Economics Education cohort. Eligibility criteria required that participants were registered 300-level

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Economics Education students at OOU who had engaged with at least one AI or digital technology tool in the context of their academic preparation, whether through formal coursework, independent study, or instructional activities during micro-teaching sessions.

For the purposes of this study, "meaningful experience" was operationally defined as sustained, purposeful use of at least one AI or digital technology tool for an academic task (such as research, data analysis, or assignment preparation) on more than one occasion, as distinct from incidental or one-off exposure; this criterion was assessed during recruitment through a short screening conversation in which prospective participants described their prior use of technology and AI tools before being invited to take part. According to Creswell and Poth (2018), a sample size of five to twenty-five participants is appropriate for phenomenological studies, as this range enables the depth of engagement necessary for meaningful thematic analysis while remaining manageable for the researcher. The final sample of ten was also judged adequate based on information power (Malterud et al., 2016), the sample had a narrow and clearly specified study aim, participants were purposively selected for information-rich accounts, the analytic strategy involved detailed case-level and cross-case coding, and by the final interviews no substantially new codes were emerging from the data, indicating that the sample was sufficient to address the research questions in depth rather than to support statistical generalisation.

Data collection

Data were collected through semi-structured in-depth interviews conducted individually with each participant. This method was selected because semi-structured interviews enable participants to describe their experiences in depth and in their own words while allowing the researcher to probe emerging themes and seek clarification on significant or complex points (Bryman, 2016). An interview guide comprising sixteen open-ended questions was developed around five thematic areas aligned with the study's research questions: perceptions of technology and AI tools in economics learning, factors shaping technological confidence and adoption, the relationship between digital knowledge and pedagogical application, social and institutional dimensions of technology integration, and visions for a digitally responsive economics teacher education. The sixteen questions, grouped by the research question each addresses, are presented in Appendix A.

Interviews were conducted within the Faculty of Education premises at OOU, Ago-Iwoye, in quiet and confidential settings convenient to each participant. Each interview lasted between fifty and seventy-five minutes. With participants' consent, interviews were audio-recorded and subsequently transcribed verbatim. Interviews were conducted in English, with Yoruba clarifications offered where necessary to ensure accurate and comfortable communication of participants' experiences. Data collection took place over a four-week period between July and August 2026, following the granting of ethical approval (see Section 3.7). Where a participant offered a clarification or explanation in Yoruba, the researcher noted the English meaning at the point of utterance during the interview and confirmed this meaning with the participant before proceeding; these clarifications were transcribed in English within the verbatim transcript, with the original Yoruba term retained in brackets where a direct equivalent term was significant to the participant's meaning, so that no substantive content was lost in translation during analysis.

Data analysis

Data were analysed using Braun and Clarke's (2006) six-phase thematic analysis procedure: familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. Interview transcripts were read repeatedly to achieve deep familiarity with the data before systematic coding commenced. Initial codes were generated inductively from meaningful units within participants' responses and subsequently grouped into broader categories. Related categories were reviewed and refined into coherent themes that captured shared patterns of meaning in participants' lived experiences with technology and AI integration. Coding was conducted manually using a structured codebook that recorded each code's label, working definition, and an illustrative extract, which was revised iteratively as new transcripts were coded and as codes were merged, split, or renamed. Analytic memos were kept throughout the process to document decisions about how codes were grouped into candidate themes and how candidate themes were subsequently reviewed against both the coded extracts and the full data set, in line with Braun and Clarke's (2006) fifth and sixth phases. To support dependability, a sample of anonymised transcripts (from which participants' names and other identifying details had been removed) and their associated codes was independently reviewed by a second reader familiar with qualitative methods, who did not have access to the audio recordings, and discrepancies in coding were discussed and resolved by consensus before the analysis proceeded to theme development. Braun and Clarke (2006) describe thematic analysis as a flexible yet rigorous method well suited to identifying, analysing, and reporting patterns within qualitative data, and its application here enabled a systematic and transparent analytical process grounded in participants' own accounts of their experiences.

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Trustworthiness

Trustworthiness was established through the criteria of credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985). Credibility was enhanced through prolonged engagement with participants during the interview process and member checking. After preliminary themes and subthemes were developed, a two-page summary of each theme, together with the illustrative extracts drawn from a participant's own transcript, was shared with that participant for review. Participants were specifically asked whether the theme summaries accurately reflected what they had intended to convey, whether their own quoted extracts were interpreted fairly, and whether any aspect of their experience had been omitted or misrepresented. Feedback from this process led to minor wording clarifications in two theme descriptions and confirmed that the overall thematic structure resonated with participants' own understanding of their experiences; no participant requested the withdrawal or substantive reinterpretation of their data. Dependability was supported through detailed documentation of all methodological decisions and an audit trail of the analytical process. Confirmability was strengthened by maintaining reflexivity throughout data collection and analysis, with the researcher continuously examining how prior quantitative research experience and familiarity with the technology adoption literature might influence interpretive choices. Transferability was promoted through thick description of the study context, participant profiles, and analytical procedures to enable readers to assess the applicability of findings to related Economics Education contexts within and beyond OOU.

Ethical considerations

Ethical approval for the study was granted by the institutional Ethics Committee before data collection commenced in July 2026; an approval reference number and approval date are not available for inclusion. All participants provided informed consent prior to their involvement, having been fully informed of the study's purpose, procedures, voluntary nature of participation, and their right to withdraw at any time without consequence to their academic standing. Confidentiality and anonymity were maintained throughout the study; participants are identified using codes (P1 to P10) rather than their names. Audio recordings were stored securely on a password-protected device and were accessed only by the researcher. For the independent coding review described in Section 3.5, anonymised transcripts, from which names and other identifying details had been removed, were shared with the second reader, who agreed to keep them confidential and had no access to the audio recordings or to any information linking participant codes to individual participants. All participants were treated with respect and dignity throughout the research process, and care was taken to ensure that interview questions did not place undue pressure on participants to present their technological experiences in an artificially positive or competent light.

RESULTS

Thematic analysis of the interview data generated five interconnected themes that capture shared patterns of meaning in 300-level Economics Education pre-service teachers' lived experiences of technology and AI integration in teaching and learning at Olabisi Onabanjo University, Ago-Iwoye. These themes are: (1) Navigating the Promise and Challenge of AI Tools in Learning, (2) Factors Shaping Technology Adoption and Confidence, (3) The Pedagogical Gap Between Digital Knowledge and Classroom Application, (4) Social and Institutional Dimensions of Technology Integration, and (5) Envisioning a Digitally Responsive Economics Teacher Education. Together, these themes illuminate the complex and layered ways in which pre-service economics teachers encounter, interpret, and engage with technology and AI in their academic and professional preparation at OOU. Because participants' accounts moved between AI tools specifically and digital technology more generally, each theme below states whether the evidence presented relates to AI tools (applications that generate, analyse, or explain content), to general digital technology (internet access, devices, computer laboratories, and online platforms), or to both. Participants' level of prior technological experience (Table 1) is noted where it helps in reading the extracts.

Theme 1: Navigating the promise and challenge of AI tools in learning

The most pervasive pattern in participants' accounts of technology and AI integration was a complex interplay between enthusiasm for the possibilities these tools offer and frustration with the practical, infrastructural, and conceptual challenges encountered in trying to use them effectively. Participants consistently acknowledged that AI tools represented a significant development in how economics could be learned and taught, yet equally consistently described experiences of confusion, inadequate preparation, and technical difficulty that complicated their engagement with these tools as 300-level students at OOU. This theme relates specifically to AI tools: all of the extracts presented below refer explicitly to AI rather than to digital technology in general.

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Subtheme 1.1: Excitement and perceived potential of AI for economics learning

Participants expressed genuine enthusiasm for the potential of AI and digital tools to transform how economics is learned, analysed, and communicated. Several described how encountering AI tools for the first time during their 300-level coursework altered their sense of what economics education could achieve.

"When I first used an AI tool to help me analyse economic data for my assignment here at OOU, I was amazed at what it could do. It showed me patterns in data that would have taken me hours to find manually. I thought, if I can use this to teach my students, they will understand economics differently." (P5)

"AI has made economics more practical for me as a student. I can now access real economic data, simulate economic models, and see how economic theories actually play out in reality. That was not possible before with just textbooks and chalk-and-talk lectures." (P7)

This excitement was particularly pronounced among participants with higher prior technological experience (both extracts above come from participants with high prior experience, P5 and P7), who described a sense of expanded possibility that technology integration brought to their understanding of economics as a discipline and as a subject for teaching.

Subtheme 1.2: Confusion and conceptual overload

Despite this enthusiasm, participants across all levels of prior technological experience also described experiences of confusion, overwhelm, and conceptual difficulty in their initial and ongoing encounters with AI tools. The pace and complexity of technological change in the educational landscape created challenges that went beyond simple technical difficulties, and several participants noted that their 300-level programme had not adequately prepared them to navigate these challenges.

"There are so many AI tools now and every day there seems to be a new one. I do not always know which one is appropriate for what I am trying to do. Nobody in our department taught me how to choose between them or how to use them critically for economics specifically." (P3)

"I sometimes feel that AI gives me answers but I do not fully understand why those answers are correct. For economics, where understanding the reasoning behind concepts is essential, this is a problem. I worry that I am using AI as a shortcut rather than as a genuine learning tool." (P9)

This tension between the accessibility of AI outputs and the depth of understanding required for genuine economic reasoning was a recurring concern among participants, suggesting that AI integration in economics teacher education requires explicit attention to critical engagement and disciplinary thinking, not merely technical operation.

Theme 2: Factors shaping technology adoption and confidence

Analysis of participants' accounts revealed a range of interconnected factors that shaped their confidence and willingness to engage with technology and AI in their learning and teaching practice. These factors operated at individual, social, and structural levels and interacted in complex ways to produce diverse patterns of technology adoption among the ten 300-level participants. This theme spans both AI tools and digital technology more generally: the extracts in Subtheme 2.1 concern confidence with AI tools against the background of participants' wider digital histories, while those in Subtheme 2.2 refer specifically to learning how to use AI tools.

Subtheme 2.1: Prior technological experience and self-efficacy

Participants with higher levels of prior technological experience consistently reported greater confidence in their ability to navigate new AI tools and greater willingness to experiment with unfamiliar digital technologies. This pattern aligns with the broader literature on technological self-efficacy as a predictor of technology adoption.

"I grew up using technology and I am not afraid of new tools. When a new AI application comes out, I try it. I believe I can figure it out even if it takes time. That confidence comes from my background and from being in an environment like OOU where some lecturers encourage us to explore." (P2)

"I have been using the internet for learning since secondary school. So when our lecturer introduced AI tools for research in 300 level, I was already somewhat prepared. The confidence was already there from before I came to this university." (P7)

By contrast, participants with limited prior technological experience described feelings of anxiety, inadequacy, and avoidance that significantly constrained their engagement with technology and AI in their 300-level coursework.

"I come from a background where we did not have much access to computers or internet. When I am asked to use AI tools in class, I feel like everyone else already knows what to do and I am behind. It makes me nervous to try in case I make a mistake in front of my coursemates." (P8)

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Read against the participant profiles in Table 1, these extracts suggest that prior technological experience shaped how participants responded to unfamiliar AI tools, although the pattern was clearer among high-experience participants than among low-experience participants. The most explicit statements of confidence and experimentation came from participants with high prior experience (P2 and P7 above; see also P5's account of independently using AI for data analysis in Subtheme 1.1). The clearest account of anxiety and hesitation came from P8, a participant with low prior experience. The other two low-experience participants framed their difficulties differently: P3 described the absence of guidance on choosing between AI tools (Subtheme 1.2) and having to explore technology on her own (Subtheme 4.2), while P6 emphasised unreliable campus internet and the cost of mobile data (Subtheme 4.1). Among participants with moderate prior experience, P10 described relying on peers to learn AI tools (Subtheme 2.2), P4 described having to work out alone how to use AI to teach economics topics (Subtheme 3.1), and P9 expressed concern about using AI as a shortcut (Subtheme 1.2). These differences are considered further in Section 5.6.

Subtheme 2.2: Peer learning and social media exposure

Social factors, particularly learning from peers and exposure to technology through social media platforms, emerged as significant informal drivers of technology confidence and adoption among the 300-level cohort. Several participants described how watching coursemates use AI tools, sharing digital resources through messaging platforms, and informal peer tutoring had contributed more to their technological competence than formal coursework at OOU.

"Most of what I know about AI tools I learned from my fellow 300-level students. We share tips, tutorials, and resources on WhatsApp. The formal lectures do not always keep up with what is available. Peer learning fills the gap that the curriculum leaves." (P10)

"Social media actually helped me understand how to use AI for my economics assignments. I followed accounts that shared tips on AI-powered data analysis and that helped me more than any single lecture I attended in 300 level so far." (P5)

This finding highlights the important but often informal role of peer and social media networks in mediating pre-service economics teachers' technology adoption at OOU, suggesting that leveraging these networks in formal pedagogical design could significantly enhance institutional technology integration efforts.

Theme 3: The pedagogical gap between digital knowledge and classroom application

A prominent theme across all ten interviews was the significant gap participants perceived between their own use of technology and AI as learners and their capacity to translate this knowledge into effective pedagogical practice in secondary school economics classrooms. Participants consistently described a disconnect between understanding how to use digital tools for personal learning and knowing how to design economics lessons that meaningfully integrate these tools for diverse secondary school students. This gap was particularly acute for 300-level students who were approaching or had recently completed micro-teaching sessions. The theme draws on both AI-specific and general technology experiences: the extracts in Subtheme 3.1 refer explicitly to AI tools, whereas those in Subtheme 3.2 concern digital technology more generally (devices, internet connectivity, and an online simulation tool) rather than AI in particular.

Subtheme 3.1: Limited pedagogical technology training

Participants identified the absence of explicit pedagogical technology training within the 300-level Economics Education curriculum as a critical gap. While many had developed personal competence with digital tools, few had received structured guidance on how to integrate technology into economics lesson planning, assessment design, or classroom management.

"In our economics methods class, we learn about teaching strategies but technology integration is treated as a separate topic, not connected to economics specifically. Nobody showed us how to use an AI tool to teach demand and supply or inflation. I have had to figure that out entirely on my own." (P4)

"I know how to use AI for my own research and OOU assignments. But when I did my micro-teaching, I realised that knowing how to use the tool is not the same as knowing how to design a lesson around it for secondary school students. That gap was very surprising and concerning to me." (P9)

This pedagogical gap has significant implications for Economics Education at OOU and potentially for comparable teacher education programmes, suggesting that technology integration in teacher preparation must move beyond digital literacy training to include disciplinary pedagogy that explicitly addresses how technology can enhance economics teaching and learning.

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Subtheme 3.2: Classroom diversity and technology accessibility

Participants who had observed or participated in teaching practice-related activities described the challenge of using technology in secondary school classrooms characterised by significant diversity in students' prior technological experience, access to devices, and digital confidence.

"I visited a secondary school for observation and the students had very different backgrounds. Some had smartphones and used them for everything. Others had never used a computer. When I think about using technology in my future economics lessons, I have to think about how to include everyone. Technology can create a new kind of inequality in the classroom if we are not careful." (P7)

"During one of our practice sessions, I wanted to use an online economics simulation tool but the school did not have stable internet. I had planned the lesson around the technology and when it failed, I was not ready to teach without it. That experience at 300 level taught me to always prepare a non-technological backup." (P2)

Theme 4: Social and institutional dimensions of technology integration

Participants' experiences of technology and AI integration were deeply shaped by the social and institutional environment of Olabisi Onabanjo University. The availability of institutional support, the technological culture of the Faculty of Education, and the attitudes of lecturers and supervisors toward technology use all emerged as significant contextual determinants of the quality and character of participants' technological engagement as 300-level students. This theme relates primarily to digital technology in general rather than to AI specifically; where participants linked these conditions directly to AI use, as in P6's account of being unable to access online AI tools and P5's account of a lecturer modelling AI use, this is indicated.

Subtheme 4.1: Institutional infrastructure and support

Infrastructure-related challenges were among the most consistently cited barriers to meaningful technology integration across all ten participants. Unreliable internet connectivity, inadequate access to computers and digital devices on the OOU campus, and the high cost of mobile data were identified as fundamental constraints that limited the frequency, depth, and quality of participants' engagement with technology and AI tools.

"The internet connection on the OOU campus is not always reliable. When it works it is sometimes slow, and when it does not work, you cannot access any online AI tools at all. I rely mostly on my phone data for my digital learning and that is expensive for a student. It really limits how much I can engage with AI in my studies." (P6)

"Our faculty does not always have a computer laboratory that is consistently open and fully functional. Sometimes the computers are outdated or not working. For technology to be genuinely integrated into our learning as Economics Education students, the infrastructure must be there consistently and dependably." (P1)

These findings resonate with research reporting that infrastructural and institutional constraints limit the use of e-learning facilities in Nigerian universities (Eze, Chinedu-Eze & Bello, 2018), and lend qualitative depth to understanding how infrastructure deficits are actually experienced by 300-level Economics Education students in their daily academic lives at OOU. These deficits concern digital access in general; their specific effect on AI use is evident in P6's account, in which unreliable connectivity made online AI tools inaccessible.

Subtheme 4.2: Lecturers' Attitudes and Role Modelling

The technological attitudes and practices of Economics Education lecturers at OOU emerged as a powerful influence on participants' own technology adoption. Participants whose lecturers actively modelled the use of technology in teaching described significantly more positive and confident attitudes toward technology integration than those whose lecturers relied exclusively on traditional pedagogical approaches.

"One of my 300-level lecturers uses AI tools in class. He shows us how to critically evaluate economic data using digital tools and then asks us to try it ourselves. That is the best technology learning I have received at OOU because it is connected directly to economics content and to how we will actually teach." (P5)

"Most of my lecturers in the department do not use technology much in their teaching. They write on the board and give notes. If I did not explore technology on my own, I would reach the end of 300 level without any real skills for technology-enhanced economics teaching. Lecturer role-modelling is very important and it is not yet consistent here." (P3)

Theme 5: Envisioning a digitally responsive economics teacher education

When invited to reflect on the future of technology and AI integration in their teacher education and professional practice, participants articulated thoughtful and often detailed visions for a more digitally responsive approach to Economics Education at OOU. These visions were grounded in their actual experiences of limitation and possibility as 300-level students and reflected a genuine commitment to the transformative potential of technology when properly supported, integrated, and critically engaged. Participants' visions combined AI-specific

and general elements: the extracts in Subtheme 5.1 refer to AI tools alongside other digital data tools, whereas those in Subtheme 5.2 concern digital infrastructure and technology policy in general.

Subtheme 5.1: Integrated technology-pedagogy training for economics

Participants were consistent in their call for technology training that was explicitly integrated with economics pedagogy rather than treated as a generic or separate competency. They described the need for the OOU Economics Education programme to model the kind of technology-enhanced economics teaching they would be expected to deliver in secondary schools.

> *"Technology training at OOU should not be a separate course divorced from economics teaching. We should be learning how to use AI tools while also learning how to teach inflation, economic growth, and financial literacy. The two must be integrated from the beginning of our 300-level training and beyond." (P7)*
>
> *"I want to graduate from OOU knowing how to design an economics lesson around a digital data tool or an AI simulation. Not just knowing how to use the tool in isolation. That integration is what will make me a genuinely twenty-first century economics teacher ready for Nigerian secondary schools." (P9)*

Subtheme 5.2: Institutional Investment and Policy Support

Participants also called for substantial institutional investment by OOU in the digital infrastructure and policy frameworks necessary to support meaningful technology integration in Economics Education. These recommendations included reliable campus internet access, up-to-date devices, explicit technology integration policies within the curriculum, and ongoing professional development for Economics Education lecturers.

> *"OOU management must invest seriously in reliable internet and modern equipment in our faculty. Without that foundation, all the encouragement in the world will not produce digitally competent economics teachers. Infrastructure is not optional; it is the prerequisite for everything else." (P10)*
>
> *"There should be a department policy that requires meaningful technology integration in all Economics Education courses, not just a technology literacy unit. Policy drives what happens in the classroom. Without policy, technology integration will always remain optional and therefore neglected." (P2)*

DISCUSSION

The tension between potential and practice in AI adoption

The finding that 300-level Economics Education pre-service teachers at OOU simultaneously express enthusiasm for the transformative potential of AI and frustration with the practical realities of engaging with these tools reflects a tension that has been documented in broader literature on technology adoption in teacher education. This tension echoes the theoretical expectation, drawn from TAM (Davis, 1989), that perceived usefulness is a critical determinant of attitude toward AI among pre-service teachers, and the present study's qualitative evidence deepens this expectation by revealing the phenomenological complexity of how perceived usefulness is constructed and experienced in practice. Roll and Wylie (2016) similarly argued that research and development in AI in education needs to engage more closely with the realities of everyday educational practice; the present findings suggest that, in a resource-constrained setting such as OOU, those realities include infrastructural and pedagogical conditions that do not yet allow the promise of AI to be fully realised.

The concern participants raised about using AI as a shortcut rather than a genuine learning tool is particularly significant for Economics Education. Critical thinking and statistical literacy are widely regarded as foundational competencies for economics education, and the present study's findings suggest that these same competencies are essential for navigating AI tools productively rather than dependently. Holmes et al. (2019) argue that educational AI must be accompanied by explicit instruction in critical digital literacy to prevent passive consumption of algorithmic outputs, a recommendation with direct relevance to the OOU Economics Education context.

Self-efficacy, peer learning, and technology confidence

The prominent role of technological self-efficacy in shaping participants' technology adoption aligns with the foundational work of Bandura (1997), who established self-efficacy as a core determinant of individuals' willingness to engage with challenging tasks. The present study adds qualitative texture to this finding by revealing how self-efficacy is developed and sustained in the lived context of a 300-level Economics Education programme. For participants with strong technological backgrounds, self-efficacy functioned as an enabling resource. For at least one participant with limited prior technological exposure (P8), low self-efficacy was experienced as anxiety and a reluctance to try AI tools in front of coursemates, while other low-exposure participants described their difficulties mainly in terms of limited guidance and the cost of access (see Subtheme 2.1).

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The emergence of peer learning and social media as informal but powerful drivers of technology adoption is a finding with important implications for how Economics Education programmes at OOU approach technology training. Abiodun and Oyewole (2025) found that social media usage and cultural exchange are significant predictors of global economic awareness among pre-service economics teachers. Collaboration with peers is also one of the six support strategies identified in Tondeur et al.'s (2012) synthesis of qualitative evidence and measured in the instrument subsequently developed and validated by Tondeur et al. (2016), suggesting that formalising peer learning structures within the OOU curriculum could yield benefits for technology adoption across the 300-level cohort.

The pedagogical gap and subject-specific technology integration

The pedagogical gap between personal technology competence and classroom application was perhaps the most consistent and significant finding of the present study. Participants articulated with considerable clarity the difference between knowing how to use an AI tool and knowing how to design economics instruction around that tool for diverse secondary school learners. Koehler and Mishra (2009) conceptualised this gap through the TPACK framework, arguing that technology integration in teaching requires not only technological knowledge and content knowledge separately but a new form of knowledge that emerges from their integration. The present study's findings suggest that 300-level Economics Education students at OOU have developed technological knowledge and content knowledge to some degree, but that their TPACK, the integrated knowledge of how technology can transform economics pedagogy, remains significantly underdeveloped.

Consistent with the TPACK framework (Koehler & Mishra, 2009), meaningful AI use in the classroom requires alignment between the tool's capabilities and the disciplinary demands of the subject. Ertmer and Ottenbreit-Leftwich (2010) similarly argued that transformative technology integration requires teachers to fundamentally rethink their beliefs about teaching and learning, not merely acquire new technical skills. The micro-teaching and field observation experiences described by OOU participants, in which infrastructure failures and pedagogical unpreparedness were exposed, underscore the urgency of addressing this TPACK gap within the 300-level curriculum.

Institutional support as a structural prerequisite

The finding that OOU's institutional infrastructure and lecturers' role-modelling are critical determinants of the quality of pre-service economics teachers' technology integration experiences is consistent with Ertmer and Ottenbreit-Leftwich's (2010) argument that technology integration is shaped by institutional culture as well as by access, and with the institution-level conditions, such as leadership, planning, and staff training, identified in Tondeur et al.'s (2012) synthesis. The present study's qualitative evidence reveals that institutional deficits are not merely statistical predictors of reduced technology use; they are lived experiences of frustration, exclusion, and professional self-doubt that shape how 300-level Economics Education students understand their own competence and their institution's commitment to their professional development.

Eze, Chinedu-Eze and Bello (2018), examining the utilisation of e-learning facilities in a Nigerian university, reported that infrastructural and institutional constraints limited their effective use. The present study's evidence from OOU is consistent with this and adds the student perspective: participants described how unreliable internet and the cost of mobile data constrained their technological engagement in ways that personal motivation alone could not overcome. These constraints concerned digital access in general, but they directly limited AI use, since the AI tools participants described depend on stable connectivity. This reinforces the present study's argument that OOU must invest in the institutional conditions for technology adaptation as a prerequisite for inclusive and quality Economics Education.

Towards a digitally responsive economics teacher education at OOU

Participants' articulations of a desired future for Economics Education at OOU, characterised by integrated technology-pedagogy training, robust institutional infrastructure, and policy frameworks that mandate meaningful technology integration, represent a vision that is both practically grounded and theoretically coherent. This vision aligns with Voogt et al.'s (2018) call for systemic approaches to technology integration in teacher education that address curriculum design, institutional infrastructure, faculty development, and policy simultaneously. Tondeur et al. (2012, 2016) similarly argue for a systematic approach in which technology preparation is embedded across the teacher education programme and supported by role models, learning by design, and authentic experiences, rather than confined to a standalone course. Ogundipe and Oyewole (2025) demonstrated that technological proficiency and virtual collaboration are significant predictors of global adaptability among social studies pre-service teachers, reinforcing the importance of these competencies for Economics Education at OOU. This aligns with findings from technical college students in Ogun State, where virtual platforms combined with emotional

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mastery training were associated with stronger academic engagement, suggesting that the benefits of virtual and technology-mediated learning environments in the state extend across different levels and types of education, not only pre-service teacher preparation (Kolade & Ojo David, 2026).

The call for policy support alongside infrastructure investment reflects an understanding among 300-level participants that sustainable technology integration in teacher education requires systemic rather than merely individual change. Selwyn (2019) cautions that technology in education is never neutral, and that policy frameworks for technology integration must attend carefully to questions of equity, access, and pedagogical purpose. Oyewole (2026) demonstrated the connection between media literacy, peer collaboration, and civic engagement among pre-service teachers, suggesting that digitally literate, critically engaged, and collaboratively competent teachers are better positioned not only to use technology effectively in their classrooms but to participate as active agents in shaping the digital educational culture of their institutions. OOU has an opportunity to position its Economics Education programme as a model for technology-integrated teacher preparation in Ogun State.

Distinguishing AI-specific experiences from general technology use, and variation among participants

Across the themes reported above, participants' accounts moved between experiences that were specific to generative and analytic AI applications, such as pattern detection in economic data and automated explanation of concepts, and experiences of digital technology more broadly, such as internet access, computer laboratories, and online learning platforms. This distinction matters because the barriers participants described, particularly around infrastructure and institutional support (Theme 4), applied to technology use in general, whereas the excitement and the concerns about intellectual shortcuts described in Theme 1 were specific to AI tools that generate or interpret content rather than simply transmit it. For this reason, each theme in Section 4 states whether its evidence relates to AI tools, to general digital technology, or to both. The present study followed participants' own framing of what counted as an "AI tool" rather than imposing a predetermined taxonomy, and it is a limitation of the underlying data, acknowledged in Section 6, that not every participant named the specific AI application they were describing; future work using this design should ask participants directly to name the applications they use, so that experiences can be compared across specific tools rather than the general category of "AI."

It is also important to note that participants did not hold uniform views. While several thematic descriptions above use language such as "participants consistently" to describe patterns that were widely shared, most notably infrastructural frustration and enthusiasm about AI's analytic potential, other aspects of participants' experiences varied, and some of this variation appears to be associated with prior technological experience (Table 1). The evidence for this is strongest among participants with high prior experience: P2 and P7 described confidence and experimentation as their default response to unfamiliar AI tools, and P5 described independently using AI for data analysis (Subthemes 1.1 and 2.1). Among participants with low prior experience, the evidence is more mixed. P8 explicitly described anxiety and hesitation about using AI tools in front of coursemates, whereas P3 framed her difficulties mainly in terms of a lack of guidance and the need to explore technology on her own, and P6 emphasised the cost and unreliability of internet access rather than anxiety (Subthemes 1.2, 2.1, 4.1, and 4.2). Participants with moderate prior experience (P1, P4, P9, and P10) did not form a clearly distinct group: their extracts variously describe reliance on peers (P10), self-directed learning (P4), concern about AI as a shortcut (P9), and infrastructural constraints (P1). Prior technological experience is therefore presented as a possible moderating factor that is suggested by, but not conclusively established from, the present data, rather than as evidence that participants within each experience group responded identically. Examining it more directly would require a larger sample and interview questions designed for that purpose.

LIMITATIONS

Several limitations should be acknowledged in interpreting the findings of this study. First, the study was conducted at a single institution, Olabisi Onabanjo University, with a small purposive sample of ten 300-level Economics Education students; the findings therefore represent the in-depth, information-rich accounts of these particular participants and are not intended to be statistically generalisable to all pre-service Economics teachers in Ogun State or Nigeria more broadly. Second, the data consist entirely of self-reported interview accounts, which are subject to the limitations of retrospective recall and the possibility of social desirability bias, particularly given that participants were describing their own competence and preparedness to a researcher associated with their department. Third, as noted in Section 5.6, participants did not always specify which AI application they were referring to, which limits the precision with which specific tools, as opposed to the general category of AI, can be linked to particular experiences. Fourth, AI tools and applications are changing rapidly, and the specific tools and platforms referenced by participants during data collection in mid-2026 may already differ from those available to future cohorts, which may limit the longevity of some tool-specific observations while the broader patterns of self-efficacy, institutional support, and pedagogical gap are expected to remain relevant. Finally, while member checking

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and independent coding review were used to strengthen credibility and dependability, the interpretation of qualitative data inevitably involves the researcher's own analytic judgement, and readers should consider the findings as one credible interpretation of participants' accounts rather than the only possible reading of the data.

CONCLUSION

This study explored the lived experiences of 300-level Economics Education pre-service teachers at Olabisi Onabanjo University, Ago-Iwoye, Ogun State, regarding technology and artificial intelligence integration in their teaching and learning. Using a phenomenologically oriented qualitative design, with thematic analysis of data from ten purposively selected participants, five interconnected themes were identified: navigating the promise and challenge of AI tools in learning, factors shaping technology adoption and confidence, the pedagogical gap between digital knowledge and classroom application, social and institutional dimensions of technology integration, and envisioning a digitally responsive economics teacher education.

The findings reveal that 300-level Economics Education students at OOU experience a complex and multi-layered engagement with technology and AI in their academic preparation. They recognise and are genuinely excited by the transformative potential of these tools for economics teaching and learning, yet consistently encounter structural, pedagogical, and self-efficacy-related challenges that limit the depth and quality of their technological engagement. The most significant of these challenges is the pedagogical gap between personal technology competence and subject-specific instructional design, a gap that current 300-level coursework at OOU appears inadequately equipped to address. As Koehler and Mishra (2009) argued, effective technology integration requires an integrated form of technological pedagogical content knowledge that goes beyond separate competencies in technology and economics content, and it is precisely this integrated knowledge that the present study's participants identified as most lacking in their current preparation.

The study contributes to the growing body of scholarship on technology and AI integration in Nigerian teacher education by providing qualitative depth to understanding how pre-service economics teachers subjectively experience the demands of digital transformation in their professional preparation. It demonstrates that quantitative predictors of technology adoption identified in previous research, including technological self-efficacy, institutional support, digital literacy, and peer collaboration, are not merely statistical associations but lived realities that shape the professional identities, pedagogical confidence, and technological trajectories of 300-level Economics Education students at OOU. As all ten participants were drawn from a single institution, these findings are best read as an in-depth account of technology and AI integration at Olabisi Onabanjo University specifically, rather than as a representative picture of pre-service Economics teachers across Ogun State as a whole; the recommendations below are offered as implications suggested by this context-specific study for OOU and for institutions in comparable settings, rather than as claims about the wider population of pre-service Economics teachers in the state.

The Department of Social Science Education, the Faculty of Education, and the management of Olabisi Onabanjo University should take account of these findings in developing strategies for more meaningful and equitable technology integration in Economics Education. Specific recommendations include the development of integrated technology-pedagogy modules explicitly addressing AI and digital tool use within economics content and pedagogy courses, sustained investment in digital infrastructure and reliable internet connectivity across the Faculty of Education, faculty development programmes that build lecturers' capacity for technology-enhanced economics teaching, and departmental policies that mandate and evaluate meaningful technology integration across the 300-level Economics Education curriculum. Future research should examine how technology-integrated preparation at OOU and comparable institutions affects the classroom practice, student outcomes, and professional satisfaction of economics teachers in Nigerian secondary schools.

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Ethical statement

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Ethical approval for this study was granted by the institutional Ethics Committee before data collection commenced. All participants were fully informed of the purpose and procedures of the study, the voluntary nature of their participation, and their right to withdraw at any time without consequence to their academic standing, and all provided informed consent prior to their involvement. Confidentiality and anonymity were maintained throughout the study; participants are identified only by codes (P1 to P10), and audio recordings were stored securely on a password-protected device.

Competing Interests

The author declares that there are no competing interests regarding the publication of this paper.

Author contributions

All authors contributed to the conceptualisation and design of the study, the literature review, data collection, analysis and interpretation of the findings, and the preparation and revision of the manuscript. All authors read and approved the final version of the manuscript.

Data availability

The interview data generated and analysed during this study are not publicly available because they contain information that could compromise the confidentiality of participants. Anonymised extracts supporting the findings are available from the corresponding author upon reasonable request.

AI disclosure

The authors declare that artificial intelligence (AI) tools were used solely to assist with language editing, grammar checking, and improvement of manuscript clarity. AI tools were not used to generate or analyse the underlying research evidence or data. All intellectual content, interpretation of the evidence, arguments, and conclusions remain the sole responsibility of the authors.

Biographical sketch

David I. O. Ojo is a lecturer at St. Augustine College of Education, Akoko, Lagos, Nigeria, whose primary field is economics teacher education. His research interests include technology and artificial intelligence integration in teacher preparation, pre-service teachers' understanding of macroeconomic concepts such as monetary policy and inflation, and virtual learning and counselling platforms for student engagement.

Folashade Grace David is a lecturer at St. Augustine College of Education, Akoko, Lagos, Nigeria, whose work lies in economics education and teacher preparation. Her research interests include pre-service teachers' perceptions of monetary policy and inflation, digital and AI-supported pedagogy in economics, and the professional development of teachers in Nigerian colleges of education.

Abdullahi Omolade Akindele is a lecturer at St. Augustine College of Education, Akoko, Lagos, Nigeria, whose research focuses on teacher education. His research interests include educational technology, artificial intelligence in teaching and learning, and qualitative inquiry into the experiences of pre-service teachers in Nigerian higher education.

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APPENDIX

SEMI-STRUCTURED INTERVIEW GUIDE

The interview guide comprised sixteen open-ended questions organised into five sections, each aligned with one of the study's research questions. Follow-up probes (for example, "Can you give an example?" and "What did that experience mean to you?") were used where appropriate to invite participants to elaborate.

Section A: Perceptions and experiences of AI tools in economics learning (RQ1)

1. Can you describe how you first came to use technology and AI tools in your economics studies at OOU?
2. Tell me about a specific occasion when you used an AI tool for an economics task. What did you do, and what was the experience like for you?
3. In what ways, if any, has using AI tools changed how you understand or learn economics?
4. What concerns or difficulties have you experienced when using AI tools for your economics learning?

Section B: Factors shaping confidence and adoption (RQ2)

5. How would you describe your confidence in using technology and AI tools, and where do you think that confidence, or lack of it, comes from?
6. What role have your coursemates, friends, or social media played in how you learned to use technology and AI tools?
7. What makes it easier or harder for you to use technology and AI tools in your studies?

Section C: Digital knowledge and pedagogical application (RQ3)

8. How prepared do you feel to use technology and AI tools when teaching economics in a secondary school classroom?
9. Can you describe any experience during micro-teaching, school observation, or practice sessions in which you used, or planned to use, technology in an economics lesson?
10. In your view, what is the difference between using a digital or AI tool for your own learning and using it to teach economics to secondary school students?

Section D: Social and institutional dimensions (RQ4)

11. How would you describe the availability of internet access, computers, and other digital facilities for your studies at OOU?
12. How do your lecturers use technology and AI in their teaching, and how has this influenced you?
13. What kinds of support, if any, have you received from the department or faculty for using technology and AI?

Section E: Visions for a digitally responsive economics teacher education (RQ5)

14. If you could change how technology and AI are addressed in the Economics Education programme, what would you change?
15. What do you think the university and the department should provide to prepare economics teachers for technology-rich classrooms?
16. Is there anything else about your experiences with technology and AI that you would like to share?

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