



RELEVANCE OF SOCIAL STUDIES STUDENT-TEACHERS' READINESS AND PREPAREDNESS IN THE DELIVERY OF TEACHER EDUCATION PROGRAMMES IN UNIVERSITIES IN NIGERIA

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Abstract

This paper conceptually examines the relevance of Social Studies student-teachers' readiness and preparedness in the delivery of teacher education programmes in universities in Nigeria. The effectiveness of teacher education largely depends on the extent to which student-teachers possess and apply essential pedagogical, content, technological, and psychological competencies. Anchored on Constructivist Learning Theory and Reflective Practice Theory, the paper distinguishes between readiness as the acquisition of knowledge, skills, and attitudes, and preparedness as their practical application in classroom contexts. It highlights key dimensions such as pedagogical competence, content mastery, technological integration, and professional disposition as critical to effective instructional delivery. The paper further identifies challenges affecting student-teachers' development, including inadequate teaching practice, poor ICT integration, and limited mentorship. It concludes that strengthening readiness and preparedness is vital for improving instructional quality and achieving educational goals in Nigeria. The paper made the following suggestions: Enhancing teaching practice, integration of experiential and reflective learning, improved ICT training, provision of adequate resources, and sustained mentorship programs.

Keywords: Social Studies, Student-Teachers, readiness, preparedness, teacher education, Nigeria.

Introduction

Teacher education plays a pivotal role in shaping the quality of any nation's educational system. Teaching practice is a vital component of teacher training where students are assigned to schools to practice how to plan and teach lessons and be involved in other school activities (Ode et al., 2020). According to Jamal-Dori-Lal and Delhi (2021). Teacher education is crucial for student quality because it trains teachers to handle everyday classroom situations and to tailor their teaching methods to fit specific groups of learners. In Nigeria, Universities and Colleges of Education are entrusted with the responsibility of preparing student-teachers who can effectively deliver curriculum content and foster meaningful learning experiences. Social Studies education, in particular, is designed to equip learners with the knowledge, skills, values, and attitudes necessary for responsible citizenship and national development.

However, the effectiveness of teacher education programs is closely linked to the extent to which student-teachers are adequately prepared for the realities of classroom practice. According to Eghan (2025), for teachers to be effective, they need appropriate abilities, dispositions, self-assurance, and understanding to successfully guide and assist students in the teaching and learning processes. Readiness and preparedness are critical constructs that determine whether student-teachers can successfully transition from theoretical training to professional teaching practice. While readiness reflects the possession of essential knowledge, skills, and attitudes, preparedness emphasises the application of these competencies in real-life teaching contexts. This paper, therefore, conceptually examines the relevance of Social Studies student-teachers' readiness and preparedness in the delivery of teacher education programs in Nigerian Universities.

Theoretical Framework

The theories explaining this paper are hinged on Constructivist learning theory and Reflective practice theory.

Jean Piaget 1952: Cognitive Constructivism

Jean Piaget's (1952) theory of cognitive development argued that children think differently from adults and that their cognitive abilities developed through a series of structured stages. Learning is seen as a process of

adaptation to the environment through mental structures called schemas. The key concepts in Piaget's (1952) theory of cognitive development are:

- a) Schema: Mental framework or structure that helps individuals organise knowledge
- b) Assimilation: incorporating new information into existing schemas.
- c) Accommodation: modifying existing schemas to fit new information
- d) Equilibrium: Balance between assimilation and accommodation, driving cognitive growth

According to Piaget (1952), learning is not the passive absorption of information but a continuous process of assimilation and accommodation. Assimilation refers to the incorporation of new information into existing cognitive schemas (mental frameworks), while accommodation involves modifying existing schemas to integrate new and potentially conflicting information.

Piaget identified four sequential stages of cognitive development:

1. Sensorimotor Stage (0–2 years): Learning occurs through physical interaction with the environment.
2. Preoperational Stage (2–7 years): Language development accelerates, and symbolic thinking begins, but logical reasoning is still limited.
3. Concrete Operational Stage (7–11 years): Children begin to think logically about concrete events and understand the concept of conservation.
4. Formal Operational Stage (11 years and up): Abstract reasoning, hypothetical thinking, and systematic problem-solving emerge

In the classroom setting, Piaget's theory suggests that teaching strategies should align with students' developmental stages. Constructivists consider learning as an active process; thus, teaching should provide opportunities for hands-on exploration, discovery learning, and problem-solving. Teachers must create learning environments where students can manipulate objects, engage in trial and error, and build their understanding at their own pace. Piaget's emphasis on individual cognition underscores the importance of personalised learning experiences and developmentally appropriate pedagogy. By implication, the constructivists favour student-centred approaches to teaching. To ensure active student participation, teachers must become highly skilled questioners (Yidana & Lawal, 2015)

Reflective Practice Theory

Donald Schon's (1983) Reflective focuses on reflection-in-action and reflection-on-action in professional practice. Reflective practice involves thinking about one's experiences to gain a deeper understanding and improve future actions. It bridges the gap between theory and practice, making learning more meaningful and context-based. The main Concepts in Schon's (1983) Reflective Practice Theory include:

1. Reflection-in-action: Thinking and adjusting while an activity is ongoing.
2. Reflection-on-action: Looking back after the activity to evaluate performance.
3. Critical reflection: Questioning underlying assumptions, beliefs, and values.

Reflective practice emphasises continuous self-evaluation and improvement. 'Reflective practice is usually considered a form of cyclical and systematic inquiry where teachers carefully collect evidence about their teaching practice to analyse, interpret, and evaluate their experiences with the intention to improve their future teaching (Suphasri & Chinokul, 2021). Student-teachers who engage in reflective thinking are better prepared to adapt their teaching strategies to meet learners' needs. Yalcin Arslan (2019) postulates that Reflective teachers not only aim at gaining better solutions; they also attempt to deepen their understanding of themselves as well as how the solutions they have discovered connect to other experiences and ideas. Suphasri and Chinokul (2021) stated that reflective practice is a key factor that brings change to two main areas of teachers' professional life, namely, teacher identity and teacher quality. While Teacher identity entails the way in which teachers understand themselves as teachers, teacher quality. i.e., personal and professional aspects of a teacher. Thus, Students-Teachers must build a strong understanding of themselves and of themselves within the outside context, as these influence their teaching quality. Reflective practice has the potential to promote this understanding. Reflective practice provides teachers with an opportunity for their emotions, beliefs, and personal philosophies of teaching to be challenged and refined (Suphasri, 2021). Reflective practice assists beginning teachers in identifying what

is going on inside their minds. For this reason, the new insights gained from reflection can lead to new and effective behaviours in the classroom (Korthagen, 2017).

Secondly, reflective practice also contributes to the enhancement of teacher quality. The important aspect of teacher quality that is impacted by reflective practice is professional development, which is often defined as how a teacher learns particular knowledge and a set of skills within a specific context of a situation (Suphasri, 2021). When teachers reflect on their teaching practices, their awareness of their teaching increases. Meierdirk (2017) observed that pre-service teachers usually use reflection in order to improve their teaching in areas of classroom activities, lesson planning, behavioural management, and performance indicators.

Conceptual Clarifications

1. Student-Teachers' Readiness: Readiness refers to the extent to which student-teachers possess the foundational competencies required for teaching. According to Yasok and Mahmud (2026) and Kachope et al. (2025), teachers' readiness is moulded not only by access to technology but also by professional training, pedagogical beliefs, and confidence in instructional design. It encompasses: Pedagogical readiness, Content readiness, Technological readiness and Psychological readiness as discussed below:

2. Pedagogical readiness (knowledge of teaching methods and strategies). It refers to teachers' preparedness to design, implement, and evaluate learning experiences that meaningfully integrate digital technology in ways that support curriculum objectives and students' cognitive development. This includes an understanding of appropriate pedagogical approaches, the ability to select and use digital tools effectively, classroom management strategies in technology-rich environments, and the capacity to align assessment practices with digital learning outcomes. (Yasok & Mahmud, 2026). According to Onyia (2025), pedagogical knowledge involves understanding the theoretical foundations of experiential learning, such as Kolb's cycle, and aligning activities with curriculum objectives. Thus, Student-Teachers who lack pedagogical knowledge and readiness may struggle to move beyond surface-level use of technology, resulting in teacher-centred practices or fragmented implementation that fails to develop students' higher-order thinking and problem-solving skills.

3. Content readiness: Mastery of Social Studies concepts is a vital area of interest for effective teaching and learning to take place. Kultsum (2017) conceptualised subject matter knowledge, also known as content knowledge (CK) is the knowledge of the specific topic which teacher requires to teach. The content knowledge is the core knowledge of a teacher in a particular subject and specific content. According to Fatai et al. (2021), teachers' content knowledge is the fundamental requirement for effective teaching. Furthermore, content knowledge of teachers influences the teaching-learning process, and it has a substantial effect on learners' achievement. In Nigeria, content knowledge is one of the essential requirements for teacher qualification.

4. Technological readiness: The 21st-century teaching and learning revolves around integrating educational technologies into classrooms. According to Serika (2025), teachers were expected to adjust to these changes and successfully integrate digital technologies into their classrooms as the world quickly shifts digitally. How well educational technology integration works in classrooms is directly connected to how well teachers are trained and ready to use the technological tools for teaching. Technology in the classroom could boost student involvement. It shows that using technology well in the classroom makes students more interested, helps them understand the material better, and makes it easier for them to work with their peers. Although the use of technology in the classroom has its shortcomings, Abdullahi et al. (2025) and Serika (2025) argued that using technology in the classroom has certain disadvantages, like not enough training or having positive attitudes toward the use of technology in the classroom, and the lack of utilisation of it is still a concern. These obstacles frequently keep technology from reaching its full potential in learning environments (Serika, 2025). To address these legitimate concerns, there is a need to design a professional development program to provide teachers with continuous, relevant learning experiences and make them ready to integrate technology seamlessly into their teaching practices.

5. Psychological readiness: Zavalevskyi et al. (2024) argued that 'Psychological readiness of pedagogical teachers to interact with students in the educational digital environment contains certain functionally interconnected and interdependent components: cognitive, motivational and operational. A high level of readiness implies that

student-teachers are intellectually and emotionally equipped to engage in instructional activities (Akorede et al., 2021).

Student-Teachers' Preparedness

Preparedness goes beyond readiness by emphasising the practical application of acquired competencies. 'It entails the abilities, dispositions, self-assurance, and understanding teachers have to successfully assist students with a range of requirements (Eghan, 2025). According to Kiel et al. (2019), teacher preparedness is the ability of teachers to apply inclusive methods. This includes having a solid understanding of inclusive pedagogy, being proficient in differentiated instruction, having a good attitude towards students and feeling comfortable managing diverse classrooms. Student-Teachers' Preparedness includes: Lesson planning and delivery, Classroom management skills, Assessment and evaluation techniques and Adaptability to diverse classroom environments. Preparedness reflects the ability to function effectively in actual teaching situations.

Teacher Education Programme Delivery

Teacher education programme delivery refers to the processes through which teaching knowledge, skills, and professional values are transmitted to student-teachers. Effective delivery requires alignment between curriculum content, teaching methods, and practical experiences.

Dimensions of Readiness and Preparedness in Social Studies Education

There are dimensions to Readiness and Preparedness in Social Studies Education. These dimensions are presented below:

1. **Pedagogical Competence:** Pedagogical competence involves lesson planning, classroom management, assessment, and responsiveness to different learner needs. (Vagilad, 2025). Student-Teachers can practice and improve their teaching methods in a controlled setting by using methods like microteaching. According to Elias (2018), microteaching gives Student-Teachers a chance to think critically about their methods, get helpful criticism, and modify their strategies. Asregid et al. (2023) maintain that microteaching sessions help student-service teachers enhance their pedagogical skills by enhancing lesson planning, providing them with real-world teaching experience, and encouraging them to participate in reflective practices. Aisyah et al. (2024) added that future teachers can gain a greater comprehension of the pedagogical process by using this approach, which helps close the gap between theory and practice. Effective Social Studies teaching requires the use of participatory, inquiry-based, and problem-solving methods. Student-teachers must be competent and ready to adopt learner-centred approaches in the teaching and learning processes.

2. **Content Mastery:** Content knowledge is bordering the propositional and procedural knowledge, which implies the "what" and "why" of a subject or discipline that a teacher is expected to know and teach (Ofodu & Jimola, 2024). Basically, this signifies know-how in a particular subject, which includes the theories, concepts and principles. According to Brunetti et al. (2024), content knowledge or subject matter knowledge is a key component of teacher competence that drives learner progress. It is also a prerequisite for pedagogical content knowledge. König et al. (2020) argued that content knowledge relates to the grasp that teachers have of both the functional and syntactic structures of a particular subject. This suggests that a lack of content knowledge of social studies can lead to less effective teaching and restricts a teacher's ability to effectively address students' answers to questions they ask. Thus, Student-teachers require theoretical, practical skills and specific guidance on the procedure for teaching Social studies content for positive learning outcomes and the capacity to create rich learning experiences for their students. The idea is that teachers who demonstrate a good grasp of content can follow, analyse, and successfully build on students' thinking (Kusi et al., 2025). Given the interdisciplinary nature of Social Studies, student-teachers must possess a deep understanding of concepts drawn from history, geography, economics, and civic education. Against this backdrop, student-teachers need profound content mastery to effectively plan, teach, and reflect on their teaching (Schiering et al., 2023).

3. **Technological Competence:** Modern classrooms demand the integration of digital tools. Prepared student-teachers should be able to use multimedia resources, virtual platforms, and other ICT tools to enhance learning. According to Tondeur et al. (2020), student-teachers can better integrate technology into their classes by using the Technological Pedagogical Content Knowledge (TPACK) framework in their teacher preparation. In addition to

improving instruction, this equips Student-teachers to handle the demands of contemporary classrooms, where technology plays a crucial role. Harun (2025) added that incorporating technology into lesson planning has also demonstrated promise in improving teachers' capacity to create successful teaching resources that integrate pedagogical, technical, and content knowledge (TPACK).

4. Professional Disposition: Within the context of teaching, teachers' professional disposition, encompassing their attitudes, beliefs, and values, serves as a model for students. Positive professional dispositions are likely to be reflected in the classroom environment, impacting the overall atmosphere, student-teacher relationships, and the effectiveness of classroom management strategies employed by teachers. The theory posits that teachers' behaviours, rooted in their professional dispositions, exert significant influence on student behaviour and classroom dynamics through observational learning and social modelling (Adolfo, 2024). Therefore, in the context of the teaching profession, disposition implies adopting selfless attitudes in adhering to morally upright actions and refraining from morally questionable behaviour (Adolfo, 2024). Disposition aids teachers in remaining receptive to new experiences and tolerant of challenging situations, promoting empathetic understanding toward students' needs (Adolfo, 2024). Attitudes such as commitment, ethical responsibility, and enthusiasm for teaching are essential indicators of readiness and preparedness. Professional attitudes, values, and beliefs are demonstrated through both verbal and non-verbal behaviours as teachers interact with students, families, colleagues, and communities.

Relevance of Readiness and Preparedness to Program Delivery

Instructional delivery is one of the most critical tasks facing educational institutions, so that the societal demands for improved education service delivery would achieve the best learning outcomes that enhance the quality of life of the citizenry (Weli & Ollor, 2021). The readiness and preparedness of student-teachers can significantly influence better learning outcomes in diverse contexts, such as Instructional effectiveness, Curriculum implementation and Quality assurance in education. The major role of a teacher is instructional delivery (Ayodele & Ayiti, 2018). Thus, readiness and preparedness are paramount in the delivery of instruction, it serve as critical determinants of the success of teacher education programs. According to Adonye and James (2025), instructional delivery involves facilitating, articulating and engineering the minds and attitudes of learners for socioeconomic development and nation building. Instructional delivery embraces all human interactive skills employed by the teacher to promote and facilitate learning in the classroom situation, thereby leading to improved performance on the part of the learner. It is a process in which teachers apply a catalogue of instructional strategies to communicate and interact with the learners around academic instruction, and to support student engagement for better learning outcomes (Adonye & James, 2025). According to Adonye and James (2025), the delivery method adopted in the teaching-learning process reveals the level of readiness and preparedness of the teacher.

Challenges Affecting Student-Teachers' Readiness and Preparedness in Nigeria

Despite their importance, several challenges hinder optimal readiness and preparedness. These challenges include, but are not limited to: Inadequate teaching practice duration and supervision. Overemphasis on theoretical instruction, Limited access to instructional and technological resources, Poor integration of ICT in teacher training and insufficient mentorship and professional support. Others include inadequate infrastructural facilities, insufficiently trained educators, and a scarcity of required teaching resources (Suleiman et al., 2022).

Conclusion

The study underscores that the readiness and preparedness of Social Studies student-teachers are indispensable to the effective delivery of teacher education programmes in Nigerian universities. Readiness, reflected in the acquisition of pedagogical, content, technological, and psychological competencies, provides the foundational capacity for teaching, while preparedness ensures the practical application of these competencies in real classroom contexts. Drawing from Constructivist and Reflective Practice perspectives, the paper establishes that effective teaching is both an active and reflective process that requires continuous professional growth. Furthermore, the ability of student-teachers to demonstrate pedagogical competence, content mastery, technological proficiency, and professional disposition significantly determines instructional effectiveness, curriculum implementation, and overall quality assurance in education. However, systemic challenges such as inadequate teaching practice

exposure, overreliance on theoretical instruction, poor integration of ICT, and limited mentorship continue to undermine these critical attributes.

Therefore, without deliberate and sustained efforts to strengthen student-teachers' readiness and preparedness, the goal of producing competent, innovative, and adaptable teachers may remain unattainable. Enhancing these constructs is essential not only for improving instructional delivery but also for advancing national development through the provision of quality education.

Suggestions

The paper recommends the following measures to enhance the readiness and preparedness of Social Studies Student-teachers in Nigerian universities:

1. Teaching practice programs should be extended in duration and accompanied by effective supervision to provide student-teachers with adequate real-world classroom experience.
2. Teacher education curricula should prioritise practical, student-centred, and reflective approaches, enabling student-teachers to bridge the gap between theory and practice.
3. Information and Communication Technology (ICT) should be fully integrated into teacher education programs as a core component to enhance technological competence and modern instructional delivery.
4. Universities should ensure the availability of relevant teaching and learning materials, including digital tools, to support effective training and classroom practice.
5. Structured mentorship systems involving experienced educators should be implemented to guide, support, and professionally develop student-teachers throughout their training.
6. Continuous training workshops, seminars, and capacity-building programs should be organised to enhance student-teachers' competencies and adaptability to emerging educational trends.

References

- Abdullahi, H. A., Oba, A. I., & Danjuma, I. (2025). Assessment of the utilisation of instructional materials for teaching agricultural science in senior secondary schools in Kaduna State, Nigeria. *Educational Researcher Journal*, 2(2), 75–84.
- Adolfo, A. C. (2024). Professional disposition as a predictor of classroom management of public secondary teachers in Davao De Oro Division. *International Journal of Research Publication and Reviews*, 5(6), 2092–2097.
- Adonye, H. L., & James, T. N. (2025). Teachers' professional development and content delivery in public senior secondary schools in Rivers State. *IIARD International Journal of Economics and Business Management*, 11(3), 150–167.
- Aisyah, S., Sholeh, M., Lestari, I. B., Yanti, L. D., Nuraini, N., Mayangsari, P., & Mukti, R. A. (2024). Peran penggunaan teknologi dalam pembelajaran IPS di era digital. *Jurnal Inovasi, Evaluasi dan Pengembangan Pembelajaran (JIEPP)*, 4(1), 44–52.
- Akorede, S. N., Ajayi, A., Toyin, A., & Uwadia, G. (2021). Influence of COVID-19 on the psychological wellbeing of tertiary institution students in Nigeria. *Tanzania Journal of Science*, 47(1), 70–79.
- Asregid, D., Mihiretie, D. M., & Kassa, S. A. (2023). Teacher educators' use of feedback to facilitate reflective practice among pre-service teachers during microteaching. *Cogent Education*, 10(2), Article 2257121.
- Backfisch, I., Lachner, A., Stürmer, K., & Scheiter, K. (2021). Variability of teachers' technology integration in the classroom: A matter of utility? *Computers & Education*, 166, Article 104153.
- Brunetti, A., Büchel, K., Jakob, M., Jann, B., & Steffen, D. (2024). Inadequate teacher content knowledge and what could be done about it: Evidence from El Salvador. *Journal of Development Effectiveness*, 16(2), 206–229.
- Darling-Hammond, L. (2008). Teacher learning that supports student learning. In B. Z. Presseisen (Ed.), *Teaching for intelligence* (2nd ed., pp. 91–100). Corwin Press.
- Dimri, D. (2025). Teacher preparedness and attitudes toward inclusive classrooms. *International Journal of Research and Scientific Innovation (IJRSI)*, 12(9), 2827–2832.
- Eghan, F. (2025). Teacher preparedness for inclusive classrooms: A study of special education support in basic schools in Cape Coast, Ghana. *International Journal of Education and Evaluation (IJEE)*, 11(3), 131–148.

- Elias, S. K. (2018). Pre-service teachers' approaches to the effectiveness of micro-teaching in teaching practice programs. *Open Journal of Social Sciences*, 6(5), 205–224.
- Fatai, K., Oba, A. I., Muhammed, A. O., Afolabi, K. O., Shuaib, S. B., & Jimoh, S. B. (2021). Teachers' perception on factors affecting effective teaching and learning of agricultural science in secondary schools in Ilorin Metropolis, Kwara State, Nigeria. *African Journal of Science, Technology and Mathematics Education*, 7(2), 88–94.
- Harun, A. (2025). Assessing pedagogical competence among prospective primary school teachers: A case study. *Journal of Education Review Provision*, 5(1), 53–63.
- Jamal-Dori-Lal, A., & Delhi, D. (2021). Development of teacher education in India: An elaborative study. *Awadh International Journal of Information Technology and Education*, 10(2), 23–30.
- Juliet G. Vagilidad, J. G. (2025). Organisational support, teachers' pedagogical competence, and self-efficacy. *International Journal on Science and Technology (IJSAT)*, 16(4), 1–7.
- Kachope, G., Nyakato, V. N., & Mwesigye, A. (2025). Teachers' preparedness for effective implementation of the lower secondary competence-based curriculum in Rukungiri District, Southwestern Uganda. *Journal of Research Innovation and Implications in Education*, 9(2), 1079–1086.
- Kiel, E., Braun, A., Muckenthaler, M., Heimlich, U., & Weiss, S. (2019). Self-efficacy of teachers in inclusive classes: How do teachers with different self-efficacy beliefs differ in implementing inclusion? *European Journal of Special Needs Education*, 34(5), 1–17.
- König, J., Bremerich-Vos, A., Buchholtz, C., & Glutsch, N. (2020). General pedagogical knowledge, pedagogical adaptivity in written lesson plans, and instructional practice among preservice teachers. *Journal of Curriculum Studies*, 52(6), 800–822.
- Korthagen, F. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching*, 23(4), 387–405.
- Kultsum, U. (2017). The concept of pedagogical content knowledge (PCK): Recognising the English teachers' competencies in Indonesia.
- Kusi, T. A., Opoku-Asare, N. A., & Kquofi, S. (2025). Assessing teachers' content knowledge for design education in basic schools: An exploratory study in Kumasi Metropolis, Ghana. *British Journal of Education*, 13(7), 37–51.
- Meierdirk, C. (2017). Reflections of the student teachers. *Reflective Practice*, 18(1), 23–41.
- Mir, A. H., & Alam, M. N. (2025). Constructivist learning theory: A framework for student-centred instruction in the 21st-century classroom. *International Journal of Educational Review and Social Science*, 5(4), 1273–1283.
- Ode, J. O., Iloakasia, A. O., & Maduka, O. G. (2020). Teacher education program: The place of teaching practice. *Education Review Letters*, 5(11), 1–11.
- Ofodu, G. O., & Jimola, F. E. (2024). Teachers' content knowledge: Implications for teaching practices and students' learning outcomes. *Language Teaching and Educational Research*, 7(1), 1–13.
- Onyia, C. R. (2025). Teacher preparedness for experiential learning in Owo Smart Green School: A perceptual analysis. *International Journal of Science and Research Archive*, 16(1), 1834–1845.
- Piaget, J. (1952). *The origins of intelligence in children* (M. Cook, Trans.). International Universities Press. (Original work published 1936)
- Schiering, D., Sorge, S., Keller, M. M., & Neumann, K. (2023). A proficiency model for pre-service physics teachers' pedagogical content knowledge (PCK): What constitutes high-level PCK? *Journal of Research in Science Teaching*, 60(1), 136–163.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.
- Serika, B. M. (2025). Teachers' readiness and the integration of technology in teaching. *International Journal of Multidisciplinary and Current Educational Research (IJMCER)*, 7(3), 260–290.
- Suleiman, S., Abubakar, B. D., & Rabi, A. G. (2022). Policy implementation in Nigeria's educational sector: A focus on teacher training and development. *International Journal of Education and Research*, 10(2), 147–162.

- Suphasri, P., & Chinokul, S. (2021). Reflective practice in teacher education: Issues, challenges, and considerations. *PASAA*, 62(1), 236–264.
- Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2020). Enhancing pre-service teachers' technological pedagogical content knowledge (TPACK): A mixed-method study. *Educational Technology Research and Development*, 68(1), 319–343.
- Yasok, R. B., Marfazila, & Mahmud, M. B. (2026). Pedagogical readiness of teachers in teaching digital technology: A systematic review. *International Journal of Research and Innovation in Social Science (IJRISS)*, 10(3), 7762–7772.
- Yidana, M. B., & Lawal, R. A. (2015). A competency-based model for teacher identity. *International Journal of Innovative Research & Development*, 4(4), 45–52.
- Zavalevskyi, Y., Flyarkovska, O., Dymenko, R., Moskaljova, A., Moskaljov, M., Gorbenko, S., & Khokhlina, O. (2024). Features of psychological readiness of teachers to use information and communication technologies in pedagogical activity. *Pegem Journal of Education and Instruction*, 14(1), 60–68.