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EDUCATION AND COMPETENCIES IN OWERRI EDUCATION ZONE ONE OF IMO STATE

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Abstract

This study is on Assessing the Impacts of Artificial Intelligence on Teacher Education and Competencies in Owerri Education Zone One of Imo State. The study was guided by four research questions. Owerri Education Zone One is comprised of three Local Government Areas which are; Owerri Municipal, Owerri North and Owerri West. The population of this study is comprised of all secondary school teachers in Public Secondary Schools in Owerri Education Zone One, Imo State. The population of teachers in Public Secondary Schools in Owerri Zone 1 is comprised of 1102 teachers. Purposive sampling technique was used to select 4 schools of both Junior Secondary Schools and Senior Secondary Schools from each Local Government Area in Owerri Zone 1. The sample comprised of 300 teachers in Owerri Zone One. Simple proportionate random sampling technique was used in selecting 75 teachers from each of the LGA. The instrument for data collection was a structured questionnaire titled "Artificial Intelligence on Teacher Education and Competencies Questionnaire (AITECQ)." The reliability of the instrument was established using Cronbach alpha coefficient which yielded an index of 0.96. Data collected was and analysed using mean and standard deviation. The findings show that teachers in Owerri Zone One have little or no idea of Artificial Intelligence (AI) in the

integration of teacher education. Hence, the current teacher education curriculum does not incorporate AI-related topics or skills, leaving teachers unprepared to leverage AI in their teaching practices. The findings also show that teachers are not familiar with AI-powered educational tools. The study recommended that Government should develop and implement comprehensive training programmes for teachers to enhance their AI-infused pedagogical skills and build their confidence in using AI tools.
Keywords: Artificial Intelligence (AI-Powered), Teacher Education and Competencies

Introduction

In recent times, the integration of Artificial Intelligence (AI) in education has transformed the way teachers teach and students learn. Artificial intelligence (AI) is quickly becoming an integral part of our everyday lives, transforming industries and reshaping the way we work, learn and communicate (Fitra, (2021). Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems, which encompass learning, reasoning, and self correction. According to Meylani (2024), these processes allow machines to acquire information, apply rules to reach conclusions, and improve performance through feedback and correction. AI's utility extends beyond student learning, including teacher education and professional development. It provides educators with personalized learning pathways, collaborative spaces, and experiences that enrich teaching methods (Dergunova, Aubakirova, Yelmuratova, Gulmira, Yuzikovna, & Antikeyeva, 2022). Additionally, AI aids teachers in developing critical thinking and problem-solving skills through simulations and instant feedback, proving its efficacy in professional training (Tubino & Adachi, 2022). By leveraging AI in teacher education, educators can enhance their competencies in areas such as instructional design, classroom management, and student assessment, ultimately leading to improved student outcomes and a more effective integration of technology in the classroom (Alaribe, Onyebuchi, Greg, Ipem & Michael, 2025).

As AI continues to revolutionize the education sector, teacher education has become a critical area of focus (Wang, Wang, Zhu, Wang, Tran & Du, 2024). Teachers play a vital role in shaping the future of students, and it is essential that they acquire the necessary competencies to effectively integrate AI and other technologies into their teaching practices (Tan, Cheng, & Ling, 2024). AI in teacher education and competencies is vital for preparing educators for an AI-driven world, enhancing teaching practices, and fostering continuous professional development by providing personalized learning, real-time feedback, and tools for efficient task management (Arya & Yadav, 2021). The integration of AI in education raises important concerns about ethics, equity, and teacher preparedness. Specifically, biases in AI systems, data privacy issues, and the need for responsible AI use pose significant challenges (Fahimirad & Kotamjani, 2018). Furthermore, according to Akram, Abdelrady, Al-Adwan and Ramzan (2022), teachers require professional development to build their digital and AI literacy, enabling them to effectively harness these technologies and address their complexities in a responsible manner.

The integration of AI in education has far-reaching implications for teacher development, extending beyond traditional professional development to encompass the cultivation of digital literacy and AI-specific skills. By leveraging self-determination theory, educators can create curriculum planning frameworks that empower teachers to take ownership of their professional growth and design AI-infused curricula that align with their pedagogical goals and cater to the unique needs of their students. This approach not only enhances teachers' autonomy and agency but also fosters a sense of motivation and dedication, as they become active participants in shaping their own professional development. By involving teachers in the curriculum planning process, educational institutions may promote a culture of innovation, creativity, and collaboration, ultimately

leading to more effective and engaging teaching practices (Chiu & Chai, 2020). Meylani (2024) found out that in enhancing technical capabilities, AI transforms teachers' teaching strategies by fostering personalized content, collaborative learning environments, and experiences that increase student engagement. AI-driven simulations help develop critical thinking skills, allowing educators and students alike to explore complex problems in controlled settings. Furthermore, the author found out that successful integration of AI extends to professional growth, encouraging lifelong learning and digital literacy among teachers.

AI in education poses significant challenges for teacher education and competencies Filiz, Kaya, & Adiguzel, (2025). One of the primary concerns is that AI may exacerbate existing inequalities in education, particularly if teachers are not equipped to effectively integrate these technologies into their teaching practices (Funna, & Gabay, 2025). Additionally, the rapid pace of technological change can create a sense of uncertainty and anxiety among teachers, who may feel overwhelmed by the need to continually update their skills and knowledge (Khalif, Sanmugam, Joma, Odeh & Barham, 2022). Furthermore, according to Al-Zahrani (2024) the use of AI in education raises important questions about bias, equity, and fairness, and teachers must be prepared to address these issues in their teaching practices. The effective integration of AI in education also requires teachers to develop new competencies, such as data analysis and interpretation, and to navigate the complexities of AI-driven educational systems (Walter, 2025). Walter (2025) found out that AI in the realm of education marks a transformative era that is redefining the teaching and learning methodologies fundamentally. Ultimately, according to (UNESCO, 2019), the challenges posed by AI in education highlight the need for ongoing teacher education and professional development, as well as a commitment to ensuring that all students have access to high-quality, equitable education.

The findings of Alwaqdani (2024) showed that many teachers acknowledge Artificial Intelligence in education as time saver, assist in designing and enriching activities, personalize learning experiences: however concerns exit regarding the effort required for training, potential job displacement, a lack of creativity thinking, unintended and trust in AI's error- free performance.

AI in education has significant implications for teacher education and competencies. As AI becomes increasingly prevalent in educational settings, teachers need to develop the skills and knowledge necessary to effectively integrate these technologies into their teaching practices. This includes developing digital literacy, data analysis skills, and the ability to think critically about the use of AI in education (Alaribe, Onyebuchi, Greg, Ipem & Michael, 2025). Teachers must also be able to use AI to enhance teaching and learning, while addressing issues of equity, bias, and ethics.

In the context of this study, there is a growing body of research on the impacts of artificial intelligence (AI) on education; there is a notable dearth of studies examining the specific effects of AI on teacher education and competencies in developing contexts, particularly in Imo State. The existing literature on AI in education tends to focus on developed countries, leaving a significant gap in our understanding of how AI is being integrated into teacher education programs in developing countries like Nigeria. Furthermore, few studies have explored the experiences of teachers in Owerri Municipality, Imo State, Nigeria, and the challenges they face in integrating AI into their teaching practices. This study aims to address this gap by investigating the impacts of AI on teacher education and competencies in Owerri Municipality, with a focus on identifying the opportunities and challenges associated with AI integration in this context.

Statement of the Problem

Artificial Intelligence (AI) in education has become a global phenomenon, with far-reaching implications for teacher education and competencies. Despite the growing recognition of AI's potential to revolutionize teaching and learning, the Nigerian education system, particularly in Owerri Municipality, Imo State, is yet to fully harness the benefits of AI. Teachers who are not AI-competent may struggle to effectively integrate technology into their classroom, hindering students' development of essential skills for the future. The lack of empirical research on the impacts of AI on teacher education and competencies in this context has resulted in a significant knowledge gap, hindering informed decision-making and policy formulation. Consequently, teachers in Owerri Municipality are ill-equipped to effectively integrate AI into their teaching practices, potentially compromising the quality of education and the preparedness of students for an increasingly AI-driven world. This study seeks to address this pressing problem by assessing the impacts of AI on teacher education and competencies in Owerri Municipality, with a view to providing actionable insights that can inform policy, practice, and future research.

Purpose of the Study

The general purpose of the study is to examine the Assessing the impacts of artificial intelligence on teacher education and competencies: the case of Owerri Municipality. Specifically, the study seeks to find out;

1. the current state of AI integration in teacher education programmes.
2. the perceptions of teachers in Owerri Zone One regarding the use of AI in education.
3. the competencies required by teachers to effectively integrate AI into their teaching practices.

4. the challenges teachers in Owerri Zone ~~o~~One face in integrating AI into their teaching practices.

Research Questions

The following Research Questions guided the study:

1. What is the current state of AI integration in teacher education programs in Owerri Zone One?
2. What are the perceptions of teachers in Owerri Zone One regarding the use of AI in education?
3. What are the competencies required by teachers to effectively integrate AI into their teaching practices in Owerri Zone One?
4. What challenges do teachers in Owerri Zone One face in integrating AI into their teaching practices?

Method

The design adopted for this study was descriptive survey design. According to Nworgu (2015) descriptive survey as a research design aim at collecting data and describing in a systematic manner, the characteristics, features or facts about a given population. Owerri Education Zone one comprised of three Local Government Areas which are; Owerri Municipal, Owerri North and Owerri West. The population of this study is comprised of all secondary school teachers in Public Secondary Schools in Owerri Education Zone One, Imo State. The population of teachers in Public Secondary Schools in Owerri Zone One is comprised of 1102 teachers. Purposive sampling technique was used to select 4 schools of both Junior Secondary Schools and Senior Secondary Schools from each Local Government Area in Owerri Zone 1. The sample comprised of 300 teachers in Owerri Zone One. Simple proportionate random sampling

technique was used in selecting 75 teachers from each of the LGA. The sampling is as follows;

In Owerri Municipal, Boys Secondary School New Owerri ten (10) teachers, Comprehensive Development Secondary School Douglas Road Owerri twenty (20) teachers, Owerri City School twenty-five (25) teachers, and Urban Development Secondary School twenty (20) teachers.

In Owerri North, all the sampled schools have Junior Secondary and Senior Secondary School. Cassita Maria Secondary School, Emekuku twenty-five (25) teachers, Community Secondary School, Emekuku twenty (20) teachers, Comprehensive Secondary School, Agbala fifteen (15) teachers, Comprehensive Secondary School, Emekuku fifteen (15) teachers.

Finally, in Owerri West, all the sampled schools have Junior Secondary and Senior Secondary School. Amakohia UBI Secondary School have twenty-five (25) teachers, ARA Secondary School twenty (20) teachers, Army Day Secondary School, Obinze fifteen (15) teachers, Comprehensive Secondary School Umualum Nekede fifteen (15) teachers.

The instrument for data collection was a structured questionnaire developed by the researchers titled “Artificial Intelligence on Teacher Education and Competencies Questionnaire (AITECQ)” The instrument was based on four-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) for Research Question 1, 2, 3 and 4. To ascertain the reliability of the instrument, a trial test was carried out. The instrument was administered to 30 undergraduate students of Ngugo Comprehensive Secondary School, Ikeduru LGA. The data collected was tested using Cronbach Alpha coefficients which yielded an index 0.96 which is considered reliable for the study. Data obtained from the field trip was analysed using Mean and Standard

Deviation. Considering the four-point Likert scale instrument adopted, a mean cut-off point of 2.50 was used for decision making on the outcome of the analysis.

Results

What is the current state of AI integration in teacher education programs in Owerri Zone One?

Table 1: Means scores the Current State of AI Integration in Teacher Education Programs in Owerri Zone One.

S/N	Items	SA	A	D	SD	N	x̄	STD	Decision
1.	AI is a regular part of our teacher education program	-	11	278	11	300	2.0	0.271	Disagree
2.	Our teacher education program includes courses on AI in education.	-	-	286	14	300	1.95	0.211	Disagree
3.	I have received training on using AI tools in my teaching practice.	-	-	292	8	300	1.97	0.161	Disagree
4.	My school provides resources for integrating AI into teacher education.	-	-	297	3	300	1.99	0.099	Disagree
5.	My school provides support for integrating AI into teacher education.	-	-	263	37	300	1.87	0.329	Disagree
6.	I am familiar with AI-powered educational tools	48	69	127	56	300	2.36	0.963	Disagree
7.	AI-related topics are incorporated into our curriculum development.	-	-	198	102	300	1.66	0.475	Disagree

The findings in Table 1 show that teachers in Owerri Zone One have little or no idea of Artificial Intelligence (AI) in the integration of teacher education. Hence, the current teacher education curriculum does not incorporate AI-related topics or skills, leaving teachers unprepared to leverage AI in their teaching practices. The findings in items 6 with the mean score 2.36 shows that teachers are not familiar with AI-powered

educational tools. Items 3 with the mean 1.97 shows that teachers have not received training on using AI tools in teaching practice.

What are the Perceptions of Teachers in Owerri Zone One Regarding the Use of AI in Education?

Table 2: Means score on the Perceptions of Teachers in Owerri Zone One Regarding the Use of AI in Education.

S/N	Items	SA	A	D	SD	N	x̄	STD	Decision
1.	I believe AI can enhance student engagement in the classroom.	127	83	72	18	300	3.06	0.950	Accepted
2.	AI tools can help reduce teacher workload.	147	77	67	9	300	3.20	0.890	Accepted
3.	AI might replace human teachers in the future.	163	68	47	22	300	3.24	0.969	Accepted
4.	AI can help identify students with special needs.	84	97	78	41	300	2.74	1.026	Accepted
5.	AI can help support students with special needs	81	103	75	41	300	2.74	1.003	Accepted
6.	I'm worried about the ethical implications of AI in education.	72	138	48	42	300	2.80	0.960	Accepted
7.	I'm interested in learning more about AI applications in education.	146	128	22	4	300	3.38	0.682	Accepted

To ascertain the perceptions of teachers in Owerri Zone One regarding the use of AI in education, the findings in Table 2 in items 7 with mean score of 3.38 shows that teachers are interested in learning about AI application in education. The finding in this table also revealed that teachers in Owerri Zone One have a generally positive perception of AI in education. This suggests that teachers are open to and supportive of integrating

AI into educational practices. The relatively low standard deviation of 0.682 indicates a high level of agreement among teachers, further reinforcing the positive perception.

What are the Competencies Required by Teachers to Effectively Integrate AI into their Teaching Practices in Owerri Zone One?

Table 3: Means score on the Competencies Required by Teachers to Effectively Integrate AI into their Teaching Practices

S/N	Items	SA	A	D	SD	N	$\bar{x}$	STD	Decision
1.	Understanding AI concepts	178	68	34	20	300	3.34	0.925	Accepted
2.	Ability to integrate AI tools into lesson plans	189	77	22	12	300	3.47	0.799	Accepted
3.	Knowledge of AI-based assessment methods	162	107	25	6	300	3.41	0.729	Accepted
4.	Knowledge of AI-based evaluation methods	141	119	37	3	300	3.32	0.727	Accepted
5.	Understanding of AI's impact on teaching and learning processes	192	87	21	-	300	3.57	0.622	Accepted
6.	Understanding of AI's potential limitations	134	116	37	13	300	3.23	0.830	Accepted
7.	Ability to facilitate student-centered learning with AI	199	69	20	12	300	3.51	0.791	Accepted

The findings in table 3 shows that teachers in Owerri Zone one accepted that item statements listed. The finding in item 5 with the highest mean (3.57) shows that teachers in Owerri Zone one of Imo State believed that understanding of AI's impact on teaching and learning processes is a more required competency needed by teachers to effectively integrate AI into their teaching practices. Furthermore, the relatively low standard deviation of 0.622 indicates a high level of agreement among teachers.

What Challenges do Teachers in Owerri Zone One Face in Integrating AI into their Teaching Practices?

Table 3: Means score on the Challenges do Teachers in Owerri Zone One Face in Integrating AI into their Teaching Practices

S/N	Items	SA	A	D	SD	N	$\bar{x}$	STD	Decision
1.	I lack sufficient training on how to effectively integrate AI tools into my teaching practices.	164	106	27	3	300	3.43	0.698	Accepted
2.	I do not have access to reliable internet connectivity to utilize AI resources.	188	89	23	-	300	3.55	0.634	Accepted
3.	I lack technical support to troubleshoot AI-related issues	146	112	38	4	300	3.33	0.746	Accepted
4.	I lack technical resources to troubleshoot AI-related issues	153	82	31	34	300	3.18	1.018	Accepted
5.	I find it challenging to integrate AI into my existing teaching workload	107	112	48	33	300	2.97	0.979	Accepted
6.	I find it challenging to integrate AI into my existing teaching schedule	156	118	26	-	300	3.43	0.648	Accepted
7.	I am unsure about how to assess student learning outcomes when using AI-powered tools	152	117	22	9	300	3.37	0.750	Accepted

To ascertain the challenges teachers in Owerri Zone one face in integrating AI into their teaching practices, the findings in Table 4 items 2 with the mean score 3.55 shows that teacher in Owerri Zone one do not have access to reliable internet connectivity to utilize AI resources. Furthermore, the findings also show that teachers in Owerri Zone one lack sufficient training on how to effectively integrate AI tools into my teaching practices and also find it challenging to integrate AI into my existing teaching workload.

The relatively low standard deviation of 0.634 indicates a high level of agreement among teachers, further reinforcing the positive perception.

Summary of Findings

From the analyses of this study, the following major findings were made:

1. Teachers in Owerri Zone One believed that AI is not a regular part of teacher education program.
2. Teachers in Owerri Zone One have positive attitude towards learning more about AI applications in education.
3. Teachers in Owerri Zone One do not have access to reliable internet connectivity to utilize AI resources.
4. Teachers in Owerri Zone One believe in the understanding of AI's impact on teaching and learning processes.

Discussion

The finding in table 1 shows that teachers in Owerri Zone One have little idea of Artificial Intelligence (AI) in the integration of teacher education. Hence, the current teacher education curriculum does not incorporate AI-related topics or skills, leaving teachers unprepared to leverage AI in their teaching practices. The findings also show that teachers are not familiar with AI-powered educational tools. Finally, the finding shows that teachers in Owerri Zone One have not received adequate training on using AI tools in teaching practice. The finding of Khalif, Sanmugam, Joma, Odeh and Barham (2022) is in line with the present day study. The authors found out that technological change can create a sense of uncertainty and anxiety among teachers, who may feel overwhelmed by the need to continually update their skills and knowledge.

The finding in table 2 shows that teachers are interested in learning about AI application in education. The finding also revealed that teachers in Owerri Zone One have

a generally positive perception of AI in education. This suggests that teachers are open to and supportive of integrating AI into educational practices. The findings of Alwaqdani (2024) corroborates with the present day study; it showed that many teachers acknowledge Artificial Intelligence in education as time saver, assist in designing and enriching activities, personalize learning experiences. The finding of Khalif, Sanmugam, Joma, Odeh and Barham (2022) is in line with the present study. The authors found out that technological change can create a sense of uncertainty and anxiety among teachers, who may feel overwhelmed by the need to continually update their skills and knowledge.

The findings in table 3 shows that teachers in Owerri Zone one accepted that item statements listed. The finding in Table 4 shows that teachers in Owerri Zone one of Imo State believed that understanding of AI's impact on teaching and learning processes is a more required competency needed by teachers to effectively integrate AI into their teaching practices. The findings of Alaribe, Onyebuchi, Greg, Ipem and Michael (2025) corroborate the present day findings. The authors found out that as AI becomes increasingly prevalent in educational settings, teachers need to develop the skills and knowledge necessary to effectively integrate these technologies into their teaching practices; which includes developing digital literacy, data analysis skills, and the ability to think critically about the use of AI in education.

The findings in table 4 show that teacher in Owerri Zone one do not have access to reliable internet connectivity to utilize AI resources. Furthermore, the findings also show that teachers in Owerri Zone one lack sufficient training on how to effectively integrate AI tools into my teaching practices and also find it challenging to integrate AI into my existing teaching workload. Funna, and Gabay (2025) found out that one of the primary concerns is that AI may exacerbate existing inequalities in education, particularly

if teachers are not equipped to effectively integrate these technologies into their teaching practices.

Conclusion

The study concludes that artificial intelligence has a positive impact on teacher education and competencies in Owerri Education Zone One of Imo State, with teachers generally having a favorable perception of AI use in education. However, the effective integration of AI requires targeted training, resources, and support to build teachers' competencies and address potential challenges.

Recommendations

1. Government should develop and implement comprehensive training programs for teachers to enhance their AI-infused pedagogical skills and build their confidence in using AI tools.
2. Government should provide adequate resources and infrastructure, including AI-powered educational software and reliable internet connectivity, to support the effective integration of AI in teacher education programs.
3. Curriculum experts should develop and incorporate AI-related competencies into teacher education curricula, including technical skills, pedagogical knowledge, and critical thinking, to ensure that teachers are equipped to effectively integrate AI into their teaching practices.
4. Government should establish a support system, such as mentorship programs or peer support groups, to help teachers address challenges and share best practices in integrating AI into their teaching practices.

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