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SYNTHESIZING AI-POWERED TOOLS IN CURRICULUM DELIVERY OF MICROTEACHING COURSE IN PUBLIC UNIVERSITIES IN ANAMBRA STATE, NIGERIA

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Abstract
Microteaching is one of the core courses in all teacher training institutions, which is designed to prepare and equip student teachers with the essential competencies needed to face the complex and challenging work of teaching profession. Cognizant of the fact that the world has rapidly become digitalized; the study investigated synthesizing of AI-Powered tools in the curriculum delivery of Microteaching course in public universities in Anambra State. Three research questions guided the study. Descriptive survey research design was adopted. The population of the study comprised 312 lecturers from the faculties of Education in the two public universities. The sample size for the study was 68 lecturers obtained from two out of the 13 departments in the Faculties of Education in the two public universities using multi-stage sampling of purposive and simple random techniques. A self-structured questionnaire titled "Synthesizing AI-powered tools in Curriculum Delivery of Microteaching Course in Public Universities Questionnaire (SAIPTCDMTCPU)" was used as instrument for data collection, which was structured on a four-point rating scale and was validated by three experts. The reliability index of the instrument was 0.78 using Cronbach Alpha. The statistical measure used for data analysis was Mean. The findings of the study revealed that synthesizing AI-Powered tools in curriculum delivery of Microteaching course in the public universities is to a low extent. It further revealed that there are a lot of challenges in synthesizing AI-Powered tools in curriculum delivery of Microteaching course but with inestimable values to educational system. It was recommended among others that, lecturers in Faculty of Education specifically and other lecturers should be encouraged to synthesize AI-Powered tools in curriculum delivery as it has been proved to be invaluable in training students in today's computerized world.

Keywords: Synthesizing, AI-Powered tools, Curriculum delivery, Microteaching and Public universities**.**

Introduction:

Artificial intelligence generally regarded as AI refers to a computer system, which can carry out works or duties such as recognizing speech, seeing, understanding and translating both spoken and written language, responding to tone specifications, solving various problems and making decisions among others using human intelligence. Copeland (2025) explained artificial intelligence as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings such as ability to reason and discover meaning. In an earlier study, Aldosari (2020) described AI as the scientific study of producing machines that imitates human behavior in many fields of life like neural network, robotics, speech recognition, expert stems and natural language processing etc. In the context of this study, AI implies the use of technological driven-tools such as chatbots, intelligent tutoring systems, and adaptive learning platforms, different automated assessments among others to augment and improve curriculum delivery in education particularly in Microteaching (MT) as a course offered in the Universities and other teacher training institutions.

Microteaching is one of the compulsory courses in all teacher training institutions, which is specifically designed to systematically train student-teachers in the art of teaching by exposing them to experiment on main teacher behaviour in a controlled environment with immediate feedback using videotape. It was originally introduced at Stanford University, USA in 1963 by Dwight Allen and colleagues. Microteaching could simply be defined as a miniature or technically scaled-down teaching encounter in class size, time and teaching complexity to enable the teacher trainees to concentrate on the selected teaching skills. Ikwuka, Agu, Eze-Denco and Akudolu (2021) stated that microteaching is a teacher training technique of both pre-service and in-service teachers established for the acquisition and improvement of teaching skills utilizing real teaching situation with immediate feedback after each practice session. Comprehensively, microteaching is a system of controlled practices that make focusing on specific teaching behaviours and practicing teaching those behaviours under specific bounded conditions possible (Benedict, Holdheide, Brownell and Foley, 2016; Bronwell, Benedict, Leko, Peyton with Pua and Richards-Tutor, 2019). Ideally, it is an organized practice teaching designed to give prospective teachers confidence, support and feedback through provision of opportunities to demonstrate among peers what they intend to do with their students in the actual classroom setting.

Microteaching has been taught over the years with conventional teaching method, which could be said to have been beneficial considering the allotted time and class size of pre-service teachers. But the explicit explanations of the nature of microteaching indicate that there are so many limitations such as subjective biases, delayed feedback and difficulty in organizing MT practicum to a large number of teacher-trainees among others using only conventional teaching method. High School of America (2025) revealed that conventional method is becoming outdated with the emergence of technology due to its failure in meeting up with the rapid-changing society. Regarding this, Garima and Mudgal (2024) opined that the brick-and-mortar classrooms, physical textbooks and teachers as representatives of the education system are on the verge of integration owing to disruptive technology (AI). This suggests that there is obvious need to not only integrate but to synthesize the use of artificial intelligence in curriculum delivery of microteaching in order to empower pre-service teachers to keep abreast with the rapid technological changes of the world as teachers are one of core agents of change in any given society. Consequent upon this, student-teachers need to be equipped during their training period especially in the microteaching classes, which practically prepares trainees for the actual teaching, with the use of AI-powered tools alongside conventional method for achievement of comprehensive training that matches theory with practice. This could simply be referred to as synthesizing AI-Powered tools in microteaching curriculum delivery. Zhang, wang and Chen (2024) in support asserted that in as much the use of AI can enhance accessibility and efficiency, it is important to complement it with human mentorship to avoid concerns regarding the accuracy of AI-generated feedback, the absence of human emotional intelligence and ethical issues such as AI bias and data privacy risks.

AI has gone from being a futuristic concept to becoming integral part of human existence as its use has penetrated every facets of life. Crompton and Burke (2023) noted that AI-powered tools are being currently used in many fields to leverage learning as well as in task performance. The basic aim is to mimic human cognitive functions with the use of computer system for achievement of effectiveness and efficiency. Ouyang and Jiao (2021) buttressed this assertion by categorically stating that education presently benefits from the use of artificial intelligence but not without challenges in academic practices. There is continuous application of AI in education currently in teaching and learning as well as in the discharge of administrative tasks. AI performs variety of actions using algorithms and computer models that progressively learn from human inputs and data using AI-Powered tools, which are software applications or programs that leverages AI models and algorithms to carry out a specified task and solve problems. These tools range from simple text to image generators, complex automation software and chatbots that could be used in various institutions such as healthcare, education, commerce and agriculture to mention but a few.

In education, AI-Powered tools such as adaptive learning platforms utilize AI to customize learning paths for individual students. Morgan (2024) highlights this by asserting that adaptive learning

platforms like DreamBox and Knewton are used to analyze student's data to adjust the difficulty level of content and provide personalized data. Drawing on this data, AI tools in education such as ChatGPT can design personalized trainings for each student and adapt them in real-time to the learner's progress. In support of the above, Shamkina (2024) asserted that by creating personalized learning experience for each student and tailoring learning materials to their specific skill set, AI-powered tools give students a greater degree of control over their educational experience with enhanced critical thinking and problem-solving abilities to identify challenges fast and provide creative solutions. Again, AI-powered lesson generators use tools like Eduaide.ai or MagicSchool.ai in assisting teachers to create detailed lesson plans by inputting specific parameters such as subject, grade level, learning objectives and so on. In furtherance to the above, Eklavvya (2023) explained that Eduaide.ai and ChatGPT can also provide feedback both, which gives specific actionable feedback on student performance in microteaching. The essence of this feedback support is to make learners experience the adequate level of challenge needed for their academic pursuit, which prevents frustration with the resultant effect of improved learning outcomes.

Additionally, AI-powered tools are interestingly transforming accessibility in education through provision of diverse ways to encourage and support students with disabilities. In other words, AI-powered tools assist to create a more inclusive educational environment for all students. For instance, AI-powered text-to-speech enables students with visual impairments or dyslexia to listen to written content, thus, making textbooks, other reading and digital materials more accessible. According to Park University Information Technology (2024), TTS tools such as Natural Reader, ReadSpeaker, Use Case etc enable students with dyslexia to convert text into spoken words in order to enhance comprehension and reduce cognitive stress of reading. Aside, AI-Powered Speech-to-text (STT) tools such as Google voice Typing, Otter.ai and Microsoft's Dictate can convert spoken language into text enabling students with difficulty in typing and writing to do better academically. Nonetheless, AI-enabled tools such as Virtual Assistants and Chatbots promote interactive learning through stimulation of classroom environments learning platforms with accommodation of diverse learning paces and styles using tools like Kahoot! And Quizizz generate quizzes with students during microteaching sessions. AI-powered tools enable social learning in various ways. For example, a teacher could use summed up conversations to guide students in achieving educational goals along with facilitating group participation in online classes. According to Hwang, Xie, Wah and Gasevic (2020), AI-powered virtual assistant enables seamless interaction between students and learning platforms with provision of immediate feedback.

The potential benefits of synthesizing AI-powered tools in microteaching curriculum delivery notwithstanding, there seem to be some challenges hampering their synthesis in microteaching curriculum delivery in teacher training institutions. Some of these problems include but not limited to erratic power supply, poor internet network connectivity, cost and dearth of technological devices, teachers' perception of technology and their technological naivety, lack of technological devices and over dependence on technology among others. Concerning this, Bhbosale, Pujari, Multani (2020) and Nalbant, (2021) have drawn attention towards the negative side of integrating AI-powered tools in curriculum delivery such as increase in education cost due to expensive devices, technology addiction, negative health effects emanating from incorrect use of devices, negative impact on social life due to students' dependence on the devices and worries and concerns coming from teachers' perception and understanding of AI. However, these problems are not insurmountable and would not therefore inhibit exploration of synthesis of AI- powered tools in microteaching curriculum delivery as there may be more benefits than drawbacks in the synthesis.

Some researchers have explored on synthesizing/integrating AI-powered tools in curriculum delivery in different areas of studies. The study by Yunus, Ismail, Yusuf, Razali, Madrin Ghani and Abbas (2025) on AI- powered educational technologies: Impacts on curriculum design and implementation established that AI technologies offer unparalleled opportunities to enhance learning experiences but their successful integration needs careful planning, ethical consideration and commitment to equity. Furthermore, Tahir and Abdullah (2023) revealed from the findings of their study that lack of students' involvement, motivation, achievement and development point to the failure of universities to

integrate AI tools in Technical Vocational Education and Training (TVET) instructional delivery. In addition, Coursera (2024) stated that maintenance of facilities poses difficulties in utilizing AI tools in instructional delivery. Also, Abosede's (2025) study indicated high extent of AI adoption in the teaching/learning of Office Technology in Southwest Nigeria Higher Institutions. Furthermore, Johnson and Lee (2022) in their study disclosed that integrating AI-powered tools makes learning more realistic and as such enhances trainee engagement and preparedness. Lyanda and Owidi (2025) discovered that there are potentials of AI-tools to transform microteaching course by providing structured feedback, engaging simulations and innovative teaching support, though integrating AI-powered tools in curriculum delivery must be carefully managed to address the accompanying challenges. Roshan (2024) revealed from the findings of his study that 70% of teachers lack AI-related professional development and it is equally established that many educators are unfamiliar with AI tools like ChatGPT (Magat and Sangalang, 2024, Ruslim and Khalid, 2024). In addition, the study of Arirao (2025) indicated that current challenges faced in integrating AI-tools in teaching and learning include limited access to the internet, bias towards language and technical issues among others. Additionally, Vallejo (2019) concluded from the findings of his study that integrating AI tools in curriculum delivery will improve teachers' professional development, digital culture and literacy, while Investopia (2024) asserted that automating administrative tasks will enable teachers to pay more attention to instructional activities. In furtherance to this, Wing (2022) established that increased flexibility and creativity are among the benefits of employing AI tools in curriculum delivery. However, from studies above, there has not been a related study within the area of the study of the current study. It was based on this premise that the present study was conceived. Consequently, the following research questions were raised to guide the study:

1. To what extent are AI-powered tools synthesized in curriculum delivery of Microteaching course in public universities in Anambra State, Nigeria?

2. What are the challenges in synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities in Anambra State, Nigeria?

3. What are the potential benefits of synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities in Anambra State, Nigeria?

Method

Descriptive survey research design was used for the study based on Osuala (2014) assertion that descriptive survey identifies the present conditions, prevailing needs as well as provides information for making sound decisions. Three research questions guided the study. The population of the study comprised 312 lecturers from the Faculties of Education in the two public universities in Anambra state, one federal and one state. The sample size for the study was 68 lecturers obtained from two out of the 13 departments in the Faculties of Education of the selected public universities using simple random technique. Simple random sampling was used to select 34 lecturers each from the selected department of the institutions. The instrument for data collection was researchers' self-developed questionnaire titled "Synthesizing AI-powered Tools in Curriculum Delivery of Microteaching Course Questionnaire" (SAIPTCDMTCPUQ) structured on four-point rating scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE) for research question 1 and Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) for research questions two and three respectively. The instrument was validated by three experts in the field, one from Curriculum studies, one from Educational Technology and the other from Measurement and Evaluation, from Faculty of Education, Nnamdi Azikiwe University, Awka. The reliability of the instrument was ascertained using Cronbach Alpha, which yielded reliability index of 0.78 and was adjudged adequate. The instrument was personally administered to the respondents by the researcher to ensure proper retrieval. Data collected were analyzed using descriptive statistics of Mean. The cut-off point for accepting mean score was put at 2.50 with the decision rule that any weighted mean score from 2.50 and above was interpreted as high extent and agreed respectively while the mean score below 2.50 was interpreted as low extent or disagreed respectively.

Results

Table 1: Mean Ratings of Respondents on the Extent AI-powered tools are being synthesized in curriculum delivery of Microteaching course in public universities in Anambra state, Nigeria

S/N	These AI-Powered tools are synthesized in curriculum delivery of Microteaching course in public Universities	Mean	Remark
1	Padlet	**2.38**	**LE**
2	Edpuzzle	**2.02**	**LE**
3	Eduaide.ai	**2.32**	**LE**
4	Infographic tools	**2.41**	**LE**
5	Text-to-Speech tools	**2.11**	**LE**
6	Speech-to-Text tools	**2.35**	**LE**
7	Image editing tools	**2.08**	**LE**
8	ChatGPT	**2.58**	**HE**
	Mean of Means	**2.28**	**LE**

Data in Table 1 disclose that items 1, 2, 3, 4, 5, 6 and 7 have mean scores below the cut-off point of 2.50. This indicates that the respondents reveal that the listed items are being synthesized to a low extent in curriculum delivery of Microteaching course in public Universities. On the contrary, item 8 has mean score above the cut-off point of 2.50. This reveals that the respondents are of the view that ChatGPT is being synthesized to a high extent in curriculum delivery of Microteaching course in public Universities. The mean of means of 2.28 established that AI-powered tools are being synthesized to a low extent in curriculum delivery of Microteaching course in public Universities in Anambra State, Nigeria.

Table 2: Mean Ratings of Respondents on the Challenges in Synthesizing AI-Powered tools in Curriculum Delivery of Microteaching Course in Public Universities in Anambra state, Nigeria

S/N	Challenges in synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public Universities are:	Mean	Remark
1	Erratic power supply	**2.91**	**Agree**
2	Poor internet connection	**3.14**	**Agree**
3	Cost of technological devices	**2.95**	**Agree**
4	Dearth of technological devices	**3.02**	**Agree**
5	Lecturers' technological naivety	**2.63**	**Agree**
6	Lack of technological devices maintenance	**3.04**	**Agree**
7	Over-dependence on technology	**2.61**	**Agree**
	Mean of Means	**2.90**	**Agree**

Data in Table 2 reveal that all the items have mean scores above the cut-off mean of 2.50. This indicates that the respondents agree that all the listed items are challenges in synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities. The mean of means of 2.90 indicates that there are many challenges in synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities in Anambra State, Nigeria.

Table 3: Mean Ratings of Respondents on the Potential Benefits of Synthesizing AI-Powered Tools in Curriculum Delivery of Microteaching Course in Public Universities in Anambra State, Nigeria

S/N	Potential benefits of synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public Universities are:	Mean	Remark
1	Provision of interactive learning experiences	**3.10**	**Agree**
2	Ensuring that students' diverse needs are met	**2.86**	**Agree**
3	Facilitation of immediate feedback	**2.52**	**Agree**
4	Enablement of quick access to learning materials	**2.54**	**Agree**
5	Enhancement of personalized learning	**2.69**	**Agree**
6	Promotion of academic discoveries	**3.08**	**Agree**
7	Improvement of teaching effectiveness	**2.91**	**Agree**
	Mean of Means	**2.81**	**Agree**

Data in Table 3 establish that all the items have mean scores above the cut-off mean of 2.50 indicating

that the respondents agree that all the listed items are the potential benefits of synthesizing AI-Powered tools in public universities. The mean of means of 2.81 indicates that there are lots of potential benefits in synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities in Anambra State, Nigeria.

Discussion

Extent AI-powered tools are being synthesized in curriculum delivery of Microteaching course in Public Universities

The findings of the study revealed that AI-Powered tools are being synthesized in curriculum delivery of Microteaching course to a low extent in the public universities despite the interactive nature and professional importance of the course. This could be as a result of the fact that majority of the lecturers teaching microteaching course in the public universities are not technophiles and as such are not enthusiastic in exploring the potentials of synthesizing AI-Powered tools alongside the conventional method, which seems to be their preferred method of teaching in the curriculum delivery of the Microteaching course. Moreover, lack of periodic technological training may also be a contributory factor to the low extent of the synthesis of AI-powered tools in Microteaching curriculum delivery as university lecturers are not exposed to steady periodic ICT training to keep them abreast of the innovative transformation technology has brought into education and the world in general for enhancement of their professional practice and growth. The finding of the current study negates the findings of Abosede (2025) which indicated high extent of AI adoption in the teaching/learning of Office Technology in Southwest Nigeria Higher Institutions. However, the finding is congruent with the findings of Tahir and Abdullah (2023) that lack of students' involvement, motivation, achievement and development point to the failure of universities to integrate AI tools in Technical Vocational Education and Training (TVET) instructional delivery. In support to the above, Magat and Sangalang (2024) and Ruslim and Khalid (2024) disclosed that many educators are unfamiliar with utilization of AI tools in curriculum delivery.

Challenges in Synthesizing AI-Powered tools in Curriculum Delivery of Microteaching Course in Public Universities

The findings of the study established that there are many challenges facing synthesizing of AI-Powered tools in curriculum delivery of Microteaching course in public universities. The reason for this could not be far from the general problems of Nigerian education system, which stems from mediocrity, inadequate funding, dearth of materials, lack of maintenance and negligence of public affairs and utilities among others. Again, professional and academic laxity may be a challenge also because lecturers are not well remunerated and therefore do not have the motivation and zeal to go extra miles in making discoveries. Moreover, many lecturers are not technophiles and as such lack the technical knowledge on synthesizing AI- powered tools in curriculum delivery. The finding of the present study is in consonance with the findings of Roshan (2024) that 70% of teachers lack AI-related professional development and Coursera (2024) that maintenance of facilities pose difficulties in utilizing AI tools in instructional delivery as well as Arirao (2025), which indicated that challenges facing integration of AI-tools in teaching and learning include limited access to the internet, bias towards language and technical issues among others. The study of Lyanda and Owidi (2025) in agreement warned that integrating AI-powered tools in curriculum delivery must be carefully managed to address the accompanying challenges.

Potential Benefits of Synthesizing AI-Powered Tools in Curriculum Delivery of Microteaching Course in Public Universities

The findings of the study indicated that there are a lot of potential benefits of synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities in Anambra state, Nigeria. This may ideally not be unconnected with the practical nature of the course, where students can gain knowledge through transformative classroom of stagnant to interactive engagement by various exposures with AI-powered tools. Equally, it may be associated with 21st century educational requirements, where students construct their own knowledge with authentic problem solution, collaborating with one another in world-building simulations to enhance students, who perform low with only traditional teaching method to vibrant learners. The finding of the current study is in

consonant with the findings of Yunus, Ismail, Yusuf, Razali, Madrin Ghani and Abbas (2025) that AI technologies offer unparalleled opportunities to enhance learning experiences. The finding is also in tandem with the findings of Lyanda and Owidi (2025) that there are potentials of AI-tools to transform Microteaching course in teacher training institutes by providing structured feedback, engaging simulations and innovative teaching support to teachers and students. In fact, Vallejo (2019), Wing (2022) and Investopia (2024) summarized that using AI-Powered tools in curriculum delivery will improve teachers' professional development, digital culture and literacy, increase flexibility and creativity among others, which aligns with the finding of the current study. This suggests that the potentials of synthesizing AI-Powered tool are still very much unexplored.

Conclusion

Based on the findings of the study, it was concluded that AI-Powered tools are being synthesized in curriculum delivery of Microteaching course in public universities in Anambra state, but to a low extent. In addition, there are many challenges facing synthesizing of AI-Powered tools in curriculum delivery of Microteaching course in public universities such as erratic power supply, poor internet connection, cost and dearth of technological devices, lecturers' technological naivety etc. Also, there are lots of potential benefits of synthesizing AI-Powered tools in curriculum delivery of Microteaching course in public universities.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Faculty of Education lecturers should be encouraged to amplify the synthesis/integration of AI-Powered tools in curriculum delivery of Microteaching course in public universities as it has been discovered to be an effective method of improving professional development as well as enhancing learning through students' active engagement to meet up with the world academic demands.
2. The Federal Government should align with education stakeholders to address the challenges and demands of education sector through adequate provisions of technological tools for curriculum delivery in the public universities and proper maintenance of existing ones, ensuring stabilized power supply, organizing steady periodic training, workshops, conferences, symposium as well as re-training programmes for teachers and lecturers on the use and synthesis of AI tools in curriculum delivery at all levels of education particularly in teacher training institutions to reasonably reduce the challenges encountered in synthesizing AI powered tools in curriculum delivery of Microteaching course and possibly other courses in public universities.
3. The Federal Government, all sectors of the economy along with individuals should be encouraged to maximally explore the numerous untapped benefits of AI, which presently seems to be under-applied in the education sector for individual and general development of the society.

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