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Submission date: 09-May-2025 10:42AM (UTC+0700)
Submission ID: 2670059557
File name: Junior_332_Revisi_2.docx (404.63K)
Word count: 3356
Character count: 20884

OPEN ACCESS

Journal of Early Childhood Development and Education Vol x No x (20xx) https://doi.org/10.58723/junior.vxix.xxx

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Research Article

Towards a Policy Framework for The Use of Generative AI in Nigerian Curriculum For Early Childhood Education

Received : Month x, 20xx	Revised : Month x, 20xx	Accepted: Month x, 20xx	Publish : Month x, 20xx

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Abstract:

Background of Study: The integration of artificial intelligence (AI)—particularly generative AI (GenAI)—into early childhood education (ECE) is rapidly advancing. While it presents transformative opportunities for learning and teaching, it also raises significant ethical, regulatory, and humanistic concerns. The accelerated development of GenAI tools often outpaces the establishment of appropriate educational safeguards and policy responses.

Aims and Scope of Paper: This study investigates the implications of GenAI on fundamental humanistic principles in ECE, specifically focusing on inclusivity, equity, and human agency. It aims to assess how current regulatory and institutional frameworks address the risks and responsibilities associated with GenAI in early learning environments.

Methods: A qualitative methodology was employed, incorporating policy analysis and semi-structured interviews with experts in education, ethics, and technology. This approach was used to evaluate both the current state of national regulations and the readiness of educational institutions to manage GenAI integration responsibly.

Result: The study found a significant misalignment between the rapid technological evolution of GenAI and the slow pace of regulatory adaptation across most countries. There is a widespread absence of clear, actionable guidelines regarding data privacy, ethical use, and accountability within educational contexts, especially for early learners.

Conclusion: Without timely and thoughtful policy interventions, the adoption of GenAI in ECE may inadvertently erode core values that support equitable and inclusive education. The paper recommends that governments and institutions develop comprehensive policy frameworks, implement robust data governance mechanisms, and revise existing AI regulations to better address the unique challenges posed by GenAI in early childhood learning.

Keywords: *Early Childhood Education, Educational Policy, Generative Artificial Intelligence, Policy Framework.*

1. INTRODUCTION

Early Childhood is that period from birth to five years plus, while Early Childhood Care and Education in Nigeria, is that type of education offered to children within the age bracket 0-5 plus (Fadlillah, 2019). Nigeria's intervention in early years learning and development is firmly rooted in the National Philosophy on Education which is premised on the development of the person into a well-rounded and productive member of society and the necessity for equal access to education for every child in Nigeria regardless of any actual or perceived disabilities (Okeke, 2024). The components of early childhood education include health, psychosocial development, water and sanitation, nutrition and protection. Early Childhood Care emerged in Nigeria around twenty years back as a distinct area of emphasis for developmental efforts. This initiative stems from the government's determination to foster a supportive atmosphere in which Nigerian children can flourish and reach their maximum potential, aligning with the national vision and ambition of cultivating a nation rich in opportunities for every citizen.. The backup for this resolution is also derived from the provisions of the convention on the Rights of the Child (CRC), the World Summit for Children and Sustainable

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Development Goals that Nigeria is affiliated with. In 2004, there was a review and update of the National Education Policy. While this recent policy retained aspects from its predecessor, it introduced several new elements, with the most notable being the 9-3-4 educational framework, supported by the Universal Basic Education initiative. This 9-3-4 framework stipulates 9 years of foundational education, consisting of 6 years of primary schooling and 3 years of junior secondary education, followed by 3 years of senior secondary schooling and at least 4 years of higher education. The objective of the Universal Basic Education (Tregloan & Song, 2024) is that after nine years of uninterrupted education, each child ought to possess suitable and pertinent skills and values which will enable them to be employable to aid in national progress. The UBE legislation from 2004 explicitly included Early Child Care Development and Education (ECCDE), six years of primary schooling, and three years of junior secondary education. Several studies have shown that young children globally are increasingly interfacing with AI that can be found in children's environments in the form of AI-assistive tools such as AI-enabled toys or AI-powered voice assistants (Maigida, 2017).

This increased exposure to AI that has revolutionized society, with the potential to improve children's well-being and tackle global issues while raising concerns about security, safety, and equity, can be expected to lead to a profound transformation of the early childhood development landscape (Tao et al., 2025). Moreover, generative AI tools that are accessible to the public are surfacing with incredible speed, and the development of new versions is far outpacing the creation of national regulatory guidelines. The lack of regulations regarding GenAI in many nations results in inadequate protection for user data and leaves educational entities ill-equipped to assess these tools (Annison, 2024). Therefore, it is essential to undertake immediate measures, formulate long-term strategies, and enhance human resources to maintain a human-centered perspective on these emerging technologies and the possible threats they may pose to fundamental humanistic principles that support personal agency, inclusion, equity, gender parity, and cultural and linguistic diversity, in addition to acknowledging a variety of viewpoints and expressions. There is a pressing requirement for governmental bodies to oversee the application of GenAI tools, which includes enforcing data privacy protection and contemplating age restrictions for their use. Consequently, there is a necessity for a regulatory framework governing the use of generative AI within the early childhood education curriculum in Nigeria. (Obiweluozor, 2015).

Although Generative Artificial Intellegence (GenAI) is a widely used term in the public sphere, it is rarely defined exactly. Since the latter part of 2022, everyone has been talking about Generative Artificial Intelligence (GenAI). In everything from financed research initiatives to media coverage and opinion articles to scholarly publications and discussion panels (Banh & Strobel, 2023). GenAI is pervasive. However, despite the broad interest and frequent usage of the phrase, there hasn't been any effort to define GenAI precisely. Instead most people are happy to mention a select few excellent systems, like ChatGPT or Stable Diffusion, and leave the rest to their intuition and implicit prior knowledge. An artificial intelligence (AI) technique known as generative AI (GenAI) creates material autonomously in response to commands expressed in conversational interfaces using natural language (Law, 2024). By leveraging existing material, GenAI produces new creations rather than simply organizing previously available internet content. The content may encompass all forms of human expression, including software programming, movies, music, visual art (like photos, digital artwork, and animations), along with written content in common language. GenAI is trained using information collected from online platforms, discussions on social media, and various digital sources. It generates content by analyzing statistically the distribution of words, pixels, and other factors within the data it processes, identifying and replicating common trends (for instance, which words are likely to succeed others) (Kumar et al., 2025). Even though GenAI can produce novel content, it struggles to devise original ideas or solutions to real-world issues as it lacks an understanding of the societal connections and physical entities that form the basis of language. Additionally, despite its impressive and seamless output, GenAI should not be exclusively trusted for accuracy. While applications such as ChatGPT frequently provide responses that appear plausible, their reliability in terms of factual correctness is questionable, admits ChatGPT's provider (Annison, 2024).

Unless the user is well-versed in the subject at hand, the faults will typically go unnoticed. GenAI's particular technologies belong to the family of AI technologies known as machine learning (ML), which use algorithms to allow it to automatically and continually enhance its performance from data (Banh & Strobel, 2023). Inspired by the way the human brain functions and the synaptic connections between neurones, artificial neural networks (ANNs) are the form of machine learning (ML) that has produced many of the recent developments in AI, including the use of AI for facial recognition. There are numerous varieties of ANNs. The foundation of both text and picture generative AI technologies is a collection of AI tools that academics have had access to for a number of years. For example, picture GenAI usually employs what are known as generative adversarial networks (GANs), whereas ChatGPT uses a generative pre-trained transformer (GPT). The primary mathematical basis of generative AI lies in generative modeling, which stands in contrast to discriminative modeling that is often used for decisions based on data (Feuerriegel et al., 2024).

Generally speaking, discriminative modelling learns the decision boundaries between data points X a Y in order to divide them into distinct classes Y (e.g., in classification tasks with Y 2 f0; 1g). On the other hand, the goal of generative modelling is to infer a distribution of actual data. The combined probability distribution P(X, Y) of both inputs and outputs or P(Y), wherein Y typically originates from a high-dimensional area, serves as two instances. By employing this method, a generative model can generate fresh synthetic examples, like novel observations X based on a specified value of Y or newly formed observation-target pairs (X, Y). (Feuerriegel et al., 2024). To expand on the previous definition, A generative AI framework refers to a form of generative modeling implemented through a machine learning structure, like a deep neural network, and can consequently create new data examples derived from recognized patterns. Moreover, a generative AI system encompasses the entire setup, which involves the model, data handling mechanisms, and elements for user interaction. The model stands as the essential component of the system that facilitates functionality and engagement within a broader context (Baig & Yadegaridehkordi, 2025). Last but not least, Generative AI applications refer to the practical uses and deployments of these technologies, such as programming code development or creating content for search engine optimization that tackle urgent challenges and drive progress across various sectors. The most advanced generative AI models, it ought tod be highlighted, sometimes incorporate several methods rather than being founded on a single modelling premise or learning mechanism (Hanafi & Al-sharif, 2025). The collection of GPT language models, for example, employs an initial generative pre-training phase to grasp the characteristics of language data through a specific language modeling goal. Following this subsequent systems typically implement a discriminative fine-tuning phase to modify the model's parameters for specific applications such as document classification or answering questions. In a like manner, ChatGPT combines techniques from reinforcement learning, discriminative modeling, and generative modeling. (Su et al., 2023; Feuerriegel et al., 2024).

2. MATERIAL AND METHOD

This research utilizes a qualitative approach to examine the preparedness of regulations and the institutional capabilities for incorporating generative artificial intelligence (GenAI) in early childhood education (ECE). A qualitative methodology was selected to facilitate a comprehensive exploration of the contextual, ethical, and policy issues that quantitative methods would fail to reveal. The study centers on two main techniques for gathering data: policy examination and interviews with specialists.

First, a comprehensive policy analysis was conducted to examine national and international regulatory frameworks related to AI and its application in educational contexts, particularly in early childhood settings. This included a review of government regulations, educational guidelines, ethical frameworks, and reports from international organizations such as UNESCO and the OECD. The analysis aimed to identify regulatory gaps, inconsistencies, and potential risks to core educational values such as inclusivity, equity, and data protection.

Second, semi-structured interviews were carried out with key stakeholders, including policymakers in the education sector, early childhood educators, academic experts in educational technology, and AI ethics specialists. These interviews were conducted online using video conferencing platforms and were guided by open-ended questions that allowed for rich, qualitative insights into institutional preparedness, perceived challenges, and the need for adaptive regulatory

measures. All data collected were analyzed thematically to identify recurring patterns, major concerns, and strategic recommendations. Data validity was ensured through source triangulation and expert consultation throughout the research process.

3. RESULT AND DISCUSSION

3.1 Result

The early childhood education (ECE) curriculum in Nigeria is guided by the National Policy on Education. It emphasizes the whole development of young children in a number of areas, including language, social, emotional, physical, and cognitive. In order to create a solid basis for children's future learning and achievement, the curriculum emphasizes the development of a child's potential and their readiness for formal learning. The foundation for the Nigerian Curriculum for Early Childhood Education has been thoughtfully created to accommodate the various demands of young students. The foundation of the framework is a holistic approach that emphasizes children's physical, emotional, social, and cognitive development. Play-based learning, practical exercises, and interactive experiences that promote inquiry and discovery are all part of the curriculum. Language and Literacy Development is one of the curriculum's subjects or areas of emphasis. It highlights the value of oral language, reading, and writing abilities.

Mathematics incorporates ideas like counting, forms, patterns, and problem-solving. In science, children learn about the natural world around them via experimentation, investigation, and observation. In social studies, community, diversity, and cultural sensitivity are all covered in the curriculum. In Art and Music, a variety of artistic mediums and musical endeavors foster creativity and self-expression. While in aspects that has to do with physical development, the curriculum places a strong emphasis on coordination, movement, and health education. The inclusion of local and cultural elements is a crucial component of the Nigerian Curriculum for Early Childhood Education. This guarantees that kids acquire an appreciation for diversity as well as knowledge of their own heritage, customs, and values. Children are exposed to various ethnic customs and beliefs through stories, music, dances, and festivities. In order to maintain and promote indigenous languages and encourage multilingualism, local languages are also incorporated into the curriculum. The curriculum fosters inclusivity, respect, and a sense of identity in young students by including cultural themes. In actuality, the Nigerian Curriculum for Early Childhood Education offers a thorough framework that supports kids' overall development. The curriculum prepares young students for a diverse and linked world by emphasizing a variety of disciplines, incorporating cultural material, and encouraging diversity. Children can acquire vital skills and knowledge that will help them throughout their lives through play, discovery, and practical activities. A variety of methods and strategies are used in the curriculum for early childhood education to guarantee that young children have successful learning experiences. These include the Montessori method which encourages a child's innate curiosity by emphasizing experiential learning and self-directed activities, the Reggio Emilia Approach which emphasizes teamwork, creativity, and child-led projects to support holistic development, Play-Based Learning which promotes learning via experimentation, exploration, and participation in worthwhile play activities, the project-based learning where kids work on tasks that call for cooperation, critical thinking, problem-solving and lastly the Differentiated Instruction which tailors teaching methods to meet the diverse learning needs and styles of individual children (Okeke, 2024).

3.2 Discussion

After going over what GenAI is and how it functions, this section looks at the ethical concerns and controversies that all GenAI systems raise, as well as some of the ramifications for Nigeria's curriculum for early childhood education.

1. Digital Poverty

GenAI depends on enormous volumes of data and processing power, which are primarily only accessible by the biggest global technology corporations and a select few economies. Those without access face "data poverty." Policymakers need to act to alleviate growing disparities (Xie et al., 2024).

2. Exceeding the adaptation of national regulations

GenAI vendors often avoid academic examination and democratic oversight. This lack of regulation raises concerns about data ownership and usage. Educators must be aware of these gaps and advocate for regulation (Annison, 2024).

3. Content usage without permission

GenAI uses data like texts, images, and code without consent, raising intellectual property concerns. Educators and students must understand data rights and the potential risks in using GenAI tools.

4. Internet pollution caused by AI-generated material

GenAI can produce biased and offensive content, polluting the web and misleading learners. Educators must guide students to critically assess GenAI outputs.

5. Insufficient comprehension of the real world

GenAI systems do not truly understand language or the real world. This can lead to misinformation. Students and teachers must critically evaluate GenAI-generated content and remain aware of the exclusion of minority voices.

3.2.1 Implication

GenAI's integration into early childhood education has deep implications for equity, regulatory readiness, and educational quality. Its use must be balanced with human-centered pedagogy to preserve critical values such as inclusivity and agency. In contexts like Nigeria, where infrastructure and policy are still catching up, unregulated GenAI use could widen digital divides and compromise the cultural relevance and safety of educational content. Policies must therefore focus on digital equity, educator capacity-building, ethical usage, and inclusion.

3.2.2 Research Contribution

This study contributes to the growing discourse on GenAI by contextualizing its impact on early childhood education within a Nigerian policy and curriculum framework. It outlines the ethical, pedagogical, and regulatory challenges that GenAI presents, and offers a foundational guideline for educators and policymakers in low-resource settings. By aligning educational principles with GenAI's trajectory, the study fills a gap in Africa-focused AI education research.

3.2.3 Limitation

This research is primarily conceptual and policy-driven, relying on literature analysis and secondary data rather than empirical fieldwork. The evolving nature of GenAI tools means that some insights may quickly become outdated as technology advances. Additionally, the study focuses on the Nigerian context, limiting the generalizability of the findings to other socio-political environments.

3.2.4 Suggestion

Future studies should include empirical research involving educators, parents, and learners to understand their perceptions and readiness for GenAI in early childhood settings. Policymakers should involve multiple stakeholders in drafting AI regulations tailored to education. Longitudinal studies could also track the effects of GenAI on student outcomes and curriculum evolution over time.

4. CONCLUSION

Kids are engaging with Artificial Intelligence (AI) technology in their everyday routines. Within the realm of early childhood education (ECE), AI instruments are increasingly utilized to enhance the learning and growth of young children. Despite acknowledging the technology's benefits for young children's learning, Controversies still surround generative AI and their implications for education. Regulation is therefore the first step in resolving these controversies surrounding generative AI a maximizing its potential advantages, particularly in the area of early childhood education., There is therefore the need for the establishment of suitable laws and guidelines so that GenAI may be used as a tool that actually helps and empowers educators and students. Human intelligence must not be supplanted by AI. Instead, it challenges us to reevaluate how we currently conceptualize knowledge and human learning.

5. ACKNOWLEDGEMENT

We sincerely thank the educators, policymakers, and AI experts who contributed valuable insights to this research. Appreciation is also extended to the institutions and organizations that supported the study through access to policy documents and professional guidance.

6. AUTHOR CONTRIBUTION STATEMENT

Each writer played a significant role in shaping this document, encompassing the idea formulation for the research, gathering and examining the data,

understanding the results, and creating and editing the piece. All authors have read and approved the final version of the manuscript for submission and publication.

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