Artificial Intelligence in Education, Bridging Community Gap: A Phenomenological Approach

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ABSTRACT

Integrating Artificial Intelligence (AI) in education holds transformative potential for bridging community gaps, particularly in under-resourced and marginalized communities. This study explores the multifaceted ways AI technologies can enhance educational accessibility, quality, and equity, thereby fostering inclusive community development. The educational disparity between under-resourced and resourced communities in Nigeria is a pressing issue, primarily driven by unequal funding, insecurity, corruption, resource allocation, and teacher shortages. This gap affects academic performance and limits future opportunities for learners in the under-sourced communities. The study delves into AI-driven initiatives to reduce the digital divide, such as deploying AI-powered educational tools in underserved communities with limited access to quality education, which is imminent. By leveraging AI, this research underscores the potential to democratize education, offering tailored learning experiences that can adapt to students' diverse needs across different geographical locations in Nigeria. The study's core objective is to bridge the community gap via AI in education using a phenomenological approach. The qualitative

RESUMEN

La inteligencia artificial en la educación, acortar las distancias entre las comunidades: un enfoque fenomenológico

La integración de la Inteligencia Artificial (IA) en la educación encierra un potencial transformador para colmar las lagunas existentes en la comunidad, especialmente en las comunidades marginadas y con escasos recursos. Este estudio explora las múltiples formas en que las tecnologías de IA pueden mejorar la accesibilidad, la calidad y la equidad de la educación, fomentando así el desarrollo inclusivo de la comunidad. La disparidad educativa entre las comunidades con pocos recursos y las que carecen de ellos en Nigeria es un problema acuciante, motivado principalmente por la desigualdad en la financiación, la inseguridad, la corrupción, la asignación de recursos y la escasez de profesores. Esta brecha afecta al rendimiento académico y limita las oportunidades futuras de los alumnos de las comunidades con escasos recursos. El estudio profundiza en las iniciativas impulsadas por la IA para reducir la brecha digital, como el despliegue de herramientas educativas impulsadas por la IA en comunidades desatendidas con acceso limitado a una educación de calidad. Aprovechando la IA, esta investigación subraya el potencial para democratizar la educación,

study adopted a phenomenological approach. The population comprised all secondary school teachers in Nigeria. Fifteen public school teachers from under-resourced communities constituted the study's sample and drew purposively based on availability. The qualitative data were thematically evaluated, and three themes (i.e., learning assistance, quality education, and infrastructural deficiency) emerged from the research. This study's findings indicate that AI can provide learning assistance and improve quality education. While AI may potentially enhance learning experiences, stakeholders must quickly address the concerns about infrastructural deficiency, insecurity, corruption, and the impediment of social interaction in education. The study concluded that incorporating AI-based technology into under-resourced communities will bridge the community gap and enable all learners to compete favourably, regardless of where they reside.

Key words: AI in education, Learning assistance, Quality education, Data privacy, Phenomenological approach.

ofreciendo experiencias de aprendizaje a medida que puedan adaptarse a las diversas necesidades de los estudiantes en diferentes ubicaciones geográficas de Nigeria. El objetivo principal del estudio es colmar la brecha existente entre las comunidades a través de la IA en la educación utilizando un enfoque fenomenológico. La población estaba formada por todos los profesores de secundaria de Nigeria. Quince profesores de escuelas públicas de comunidades con escasos recursos constituyeron la muestra del estudio y se extrajeron intencionadamente en función de la disponibilidad. Los datos cualitativos se evaluaron temáticamente, y de la investigación surgieron tres temas (es decir, ayuda al aprendizaje, educación de calidad y deficiencia de infraestructuras). Las conclusiones de este estudio indican que la IA puede proporcionar ayuda al aprendizaje y mejorar la calidad de la educación. Aunque la IA puede mejorar potencialmente las experiencias de aprendizaje, las partes interesadas deben abordar rápidamente las preocupaciones sobre la deficiencia de las infraestructuras, la inseguridad, la corrupción y el impedimento de la interacción social en la educación. El estudio concluye que la incorporación de la tecnología basada en la IA en comunidades con escasos recursos reducirá la brecha comunitaria y permitirá a todos los alumnos competir favorablemente, independientemente de dónde residan.

Palabras clave: IA en la educación, Ayuda al aprendizaje, Educación de calidad, Privacidad de los datos, Enfoque fenomenológico.

1. INTRODUCTION

Education is a vital pillar for personal and societal development, yet access to quality education remains disparately distributed across the globe. The right to education is recognized as a fundamental human right (United Nations, 1948), essential for democracy, social progress, and individual freedom (Adipat & Chotikapanich, 2022; Opesemowo & Adekomaya, 2024)The inequalities in accessing quality education persist worldwide, highlighting the need for collaborative and innovative policy initiatives to address these challenges (Sit, 2024). In Nigeria, there has been a significant gap in the quality of education between learners from resourced and

under-resourced communities (Kanu et al., 2024; Okoi et al., 2024). Also, marginalized and underserved communities often face significant barriers, including limited resources, inadequate infrastructure, and socio-economic challenges, which hinder their educational opportunities. The rapid advancement in Artificial Intelligence (AI) presents a transformative potential to address these disparities and bridge the community gap in education. However, AI encompasses a range of technologies, including machine learning, natural language processing, and computer vision, which enable systems to perform tasks that traditionally require human Intelligence. In the context of education, AI can offer personalized learning experiences, intelligent tutoring systems, and adaptive learning platforms that cater to learners' diverse needs (Yılmaz, 2024). These technologies can dynamically adjust content delivery, pace, and difficulty based on individual learning patterns, thereby enhancing student engagement and improving learning outcomes.

Personalized learning systems leverage AI to create customized educational pathways for students to identify their strengths and weaknesses and adapt instruction accordingly. This individualized learning approach helps learners learn independently, ensuring they master foundational concepts before moving on to more complex topics. Intelligent tutoring systems provide learners with prompt feedback and targeted interventions, replicating the benefits of one-on-one tutoring. Adaptive learning platforms utilize data analytics to continuously assess student performance and adjust instructional strategies, offering a tailored educational experience that maximizes learning efficiency (Shafique et al., 2023). Furthermore, to improve the individualized learning experience, AI has the potential to alleviate the burden on teachers by automating routine administrative tasks such as grading, attendance tracking, and lesson planning. This allows teachers to focus more on other vital school activities, including instruction and student interaction, enhancing the overall quality of education. AI-driven analytics can also provide teachers with valuable insights into student performance, enabling data-informed decision-making and early identification of students needing additional support.

One of the major significant opportunities provided by AI in education is its potential to reduce the digital divide. AI-powered educational tools can be deployed in remote or under-resourced communities with limited access to quality education. These tools can offer interactive and engaging learning where access to quality education is limited. These tools can offer interactive and engaging learning experiences, even in under-resourced communities, democratizing education and providing equal opportunities for all learners. Some studies have established the successful implementation of AI in diverse educational settings, highlighting the feasibility and benefits of these technologies in bridging educational gaps (Ayeni et al., 2024; Farahani & Ghasmi, 2024). However, the integration of AI in education is not without challenges. We must carefully address ethical considerations such as data privacy,

algorithm bias, and transparency to ensure the equitable development and implementation of AI technologies without sidelining any communities. There is a need for robust policy frameworks and governance structures to guide the ethical use of AI in education, protecting the rights of learners and teachers while promoting inclusivity and fairness.

This study explores AI's transformative potential in bridging the community gap in education. It examines the successful implementations of AI-driven educational tools, analyzes best practices, and discusses the necessary policy frameworks to support equitable access. By understanding the role of AI in education, this study seeks to contribute to developing more inclusive and effective educational systems that benefit all members of society. The findings will provide valuable insight for teachers, policymakers, and technology developers, highlighting how AI can be harnessed to create a more equitable and accessible educational landscape.

2. RELATED WORKS

2.1. The Role of AI in Education

AI in education is becoming increasingly prominent as technology continues to improve. AI can potentially improve students' learning through personalized learning and administrative efficiency.

2.1.1. Personalized learning

One of the major applications of AI in education is personalized learning (Castro et al., 2024). AI continues to transform how students learn by personalizing education and providing valuable feedback to teachers (Kim, 2024; Yang et al., 2024). AI systems can analyze individual students' learning patterns, strengths, and weaknesses to tailor educational content and pace. This individualized learning ensures students receive the needed support, fostering a more inclusive educational landscape. With AI, students can receive personalized instruction tailored to their needs and abilities, ultimately leading to improved academic outcomes.

2.1.2. Administrative efficiency

AI can streamline administrative tasks such as grading, scheduling, and resource allocation, allowing teachers to focus more on teaching (Srinivasa et al., 2022). By reducing the administrative burden on educators, AI helps create a more efficient educational system that

serves diverse students better (Alwaqdani, 2024; Igbokwe, 2023). For instance, AI-powered technology can automatically grade multiple-choice questions, allowing teachers to provide more personalized feedback on essays and projects. In addition, AI algorithms can analyze data on student performance to identify areas where additional resources or support may be required, helping teachers tailor their lessons to better meet individual students' needs (Alam, 2023). AI technology can potentially reform education delivery by streamlining processes and enhancing students' learning experience (Alqahtani et al., 2023; Opesemowo & Ndlovu, 2024). AI technology in education can also cater to individual learning styles and paces, allowing students to learn quickly and in a way that best suits them. This adaptability can help students overcome challenges and reach their full potential. Also, AI can provide valuable insights into student progress and improvement areas, enabling teachers to tailor their teaching methods accordingly.

2.2. Challenges and Considerations of AI in Under-resourced Communities

2.2.1. Data privacy and security

The use of AI in education involves the collection and analysis of vast amounts of student data. Data privacy and security are paramount to protecting students' sensitive information and maintaining trust in AI systems. Educational institutions must implement strong security measures to safeguard this data and deny unauthorized access. Additionally, transparency in how student data is used and shared within the AI system is essential for ensuring accountability and ethical standards in education (Adams et al., 2023; Nguyen et al., 2023). By prioritizing data privacy and security, educators can harness the benefits of AI technologies (Luan et al., 2020) while still upholding their students' and stakeholders' trust and confidence. For example, a school implementing AI technology to individual online learning experiences for students must ensure that sensitive data such as grades, personal information, and learning habits are encrypted and protected from cyber-attacks. Also, the school should be transparent about how this data is being utilized to tailor educational content, ensuring that students have control over their information and understand the benefits of AI in enhancing their learning experiences.

2.2.2. Bias and Fairness

AI systems can inadvertently perpetuate existing biases if they are not carefully designed and monitored. Ensuring that AI algorithms are transparent, fair, and inclusive is crucial to

avoiding reinforcing social and educational inequalities. This can be achieved by regularly auditing AI systems for bias, using diverse data sets to train algorithms, involving diverse stakeholders in the impact of AI on marginalized communities, and working towards creating a more equitable and just society (Holzmeyer, 2021). Additionally, AI developers must prioritize ethical considerations and the well-being of all individuals their technology may impact (Konidena et al., 2024; Opesemowo, 2024). This means actively seeking feedback from communities most vulnerable to bias and discrimination and incorporating their perspectives into the decision-making process. Lin and Chang (2024) stated that by prioritizing diversity, equity, and inclusion in the development of AI systems, we can ensure that these technologies serve the greater good and contribute to a more just and equitable society for all. For example, when creating facial recognition technology, developers should engage with diverse communities to ensure the algorithm accurately identifies individuals of all races and genders. This approach can help prevent bias and discrimination in law enforcement and other industries that rely on AI technology.

2.2.3. Digital Divide

While AI has the potential to bridge educational gaps in communities, it can also exacerbate the digital divide if not implemented thoughtfully. Ensuring that all students have access to the necessary technology and internet connectivity is essential for the equitable deployment of AI in education. Without proper access to technology and the internet, students from disadvantaged backgrounds may be left behind and further marginalized (Afzal et al., 2023). This could widen the gap between those with access to cutting-edge AI tools and those without, perpetuating educational inequalities. Therefore, policymakers and educators must prioritize addressing the digital divide to ensure all students have equal opportunities to benefit from AI advancements in the classroom. Investing in infrastructure and providing resources for students in underserved communities is crucial to bridging the gap. Creating a more inclusive and equitable learning environment by ensuring all students can access technology and internet connectivity (Njeri & Taym, 2024; Olawale, 2024). Additionally, providing training and support for educators on integrating AI tools into their teaching practices can help maximize the benefits of this technology for all students. Collaboration between policymakers, educators, and technology experts ensures that AI promotes equity and enhances student learning outcomes.

2.3. Bridging the Community Gap

AI in education can aid in bridging the community gap by providing access to quality education, equal learning opportunities, and social integration. By leveraging AI technology, educational institutions can create a more inclusive and dynamic learning environment that meets the diverse needs of students. This can ultimately lead to better academic outcomes and a more engaged and empowered community of learners.

2.3.1. Access to Quality Education

AI-powered platforms can provide high-quality educational resources to students in remote or under-resourced communities. Online courses, virtual classrooms, and interactive learning modules significantly enhance access to quality education for students facing geographical or socio-economic barriers (Joshi et al., 2024); these digital platforms not only facilitate learning but also foster interaction and engagement among learners (Herrera-Granda et al., 2024). These platforms can cater for individual learning styles and allow them to learn at their own pace.(Jimola & Ofodu, 2021; Vetrivel et al., 2024). Also, it offers personalized lessons and feedback to enhance the learning experience. Specifically, AI can analyze student performance data to identify areas of improvement and provide targeted support to help students succeed (Shoaib et al., 2024). By leveraging AI technology, we can bridge the gap in educational inequality and ensure that all students have equal access to quality education regardless of the communities they belong to. In addition, AI is crucial in today's digital age, where technology significantly shapes how we learn and acquire knowledge. With the rapid advancement of AI, the possibilities for enhancing educational opportunities are endless. From virtual tutors to adaptive learning systems, AI can transform how we approach education and empower students to reach their full potential (Bates et al., 2020; Opesemowo et al., 2024). As we continue to embrace AI in education, it is crucial to ensure that these technologies are accessible and inclusive for all students, regardless of the community where the students reside. By harnessing the power of AI, we can create a more equitable and inclusive educational system that fosters lifelong learning and growth for all individuals.

2.3.2. Equal Learning Opportunities

AI can help identify and address learning disparities among students. By continuously monitoring student performance, AI systems can detect when students are struggling and provide additional resources or interventions (Hooda et al., 2022). This ensures that all students have an equal chance to succeed, regardless of their location. While AI may help identify learning

disparities, relying solely on technology to address these issues may overlook the importance of personalized and human-centred interventions considering individual student needs and circumstances. However, access to AI technology itself may not be equitable across all schools and communities, potentially widening the gap in learning opportunities. Educators need to strike a balance between utilizing AI technology and implementing personalized learning to support students effectively. By combining the insights provided by AI with targeted support and resources, educators can create a more inclusive and equitable learning environment (Lin & Chang, 2024). This approach not only addresses the immediate learning needs of students but also promotes a holistic approach to education that considers each student's strengths and challenges. Ultimately, the goal is to ensure all students have the necessary support and resources to thrive academically and reach their full potential.

2.3.3. Social Integration

AI can facilitate social integration by promoting collaborative learning and interaction among students from various backgrounds. Virtual classrooms and online discussion forms allow students to connect and collaborate with peers globally (Mlodzianowska et al., 2024), thus fostering a sense of community and sharing learning. AI's ability to analyze student interactions and learning patterns significantly enhances social integration by providing individualized recommendations for group projects and study sessions (Kaswan et al., 2024). This capability fosters collaborative learning environments, allowing students to engage more effectively with their peers (Zheng et al., 2024). By breaking down barriers to communication and collaboration, AI promotes inclusivity and diversity in educational settings, creating a more enriching and engaging learning environment for all students involved (Hymel & Katz, 2019). Consequently, AI in education can reform how students interact and learn, promoting a more interconnected and globalized community. Furthermore, through AI-powered tools and platforms, learners can engage robustly with peers from different backgrounds and communities, expanding their knowledge frontiers, perspectives and understanding of the world around them. This interconnection fosters a sense of empathy and appreciation for diversity, preparing students to thrive in an increasingly globalized world.

2.4. Research questions

Three research questions guided this study.

- What is the life experience of teachers using AI in education?

- What is the role of AI in reducing educational disparities in communities?

- What problems and opportunities do under-resourced communities encounter when adopting AI-based educational tools?

3. MATERIALS AND METHOD

3.1. Design

In this study, the researcher adopted a phenomenological design to explore how AI in education can be deplored to bridge the community gap. Sims (2024) describes phenomenological design as how people experience and understand a phenomenon. This type of design focuses on the subjective experiences of individuals and seeks to uncover the meaning they attach to a particular event. By capturing the essence of these lived experiences, researchers can gain valuable insights into how individuals interpret and make sense of the world around them. Phenomenological design is instrumental in exploring complex and nuanced topics that require a deep understanding of human perception and consciousness.

3.2. Population and Sample

The study population comprises all government-owned (public) secondary school teachers in Nigeria, while the target population comprises senior secondary school teachers. The research adopted a purposive sampling technique to select fifteen senior secondary school teachers from public schools based on their availability. The teachers were invited to participate in an online interview to gather their perspectives on the challenges and opportunities of using AI technology to bridge the community gap at the senior secondary level. Through these qualitative data collection methods, the study aims to understand better the specific needs and issues teachers face in this setting. By focusing on experienced and knowledgeable educators, the research hopes to uncover valuable insights that can inform future policy and practice initiatives to enhance the quality of education in public secondary schools.

3.3. Data collection

The data were collected from fifteen teachers who had knowledge of AI in education and how it can be used to bridge community gaps. The teachers were selected from various schools and had different experience levels with AI technology. Furthermore, the teachers were grouped into groups: Group One, Two, and Three. The researcher gathered data using an in-depth

semi-structured interview guide (SSIG) to understand how the teachers integrated AI into their teaching. An online interview was used to collect data that lasted for thirteen minutes.

3.4. Data analysis

The researcher conducted in-depth interviews with participants to understand better how AI in education can be used to bridge the community gap. The study applied thematic approaches to analyze data. The teacher's responses were coded, transcribed, and grouped into common themes that emerged from the semi-structured interviews. This qualitative data analysis revealed multifaceted insights into the potential benefits and challenges of using AI technologies in education to connect diverse communities.

3.5. Ethical issues

The teachers were informed that the purpose of the interview was for research and that their identities would not be divulged publicly. This was done to secure the participants' confidence, and they were also briefed about their willingness to opt-out at any point during the interview if they felt uncomfortable or no longer wished to participate. Additionally, they were reminded that their honest feedback and insights were crucial to a better understanding the topic being studied. Overall, the teachers were provided with all necessary information to ensure their comfort and privacy throughout the interview process.

4. RESULTS

4.1. Theme one: Learning assistance

The participants were asked questions about their experience using AI in education, which can bridge the community gap. The participants in Group One responded *that using AI will definitely bridge the gap in education between learners from the under-resourced communities and resourced communities because it provides equal access to quality resources and personalized learning experiences. They also believe that AI can help level the playing field by tailoring instruction to individual abilities and providing additional support to students who may not have access to traditional educational opportunities.* Group Two participants *also concurred, unveiling that AI has the capacity to give an equal level playing field for all students, irrespective of their background or socio-economic status. With AI technology, students in under-resourced areas can receive the same level of education as their resourced counterparts.* Participants in Group

One *see AI as a tool to empower students in underserved communities and help them reach their full potential.* By utilizing AI in the education system, they hope to close the achievement gap and ensure all students have an equal opportunity to succeed. Overall, the group consensus was that AI in education has the power to create a more equitable and inclusive learning environment for all students.

Concerning the types of AI tools adopted by teachers in education, participants in Group Three revealed that they use various tools, such *as virtual tutors, adaptive learning platforms, and automated grading systems, to enhance their teaching practices.* These AI tools have been particularly beneficial in providing individualized learning experiences for students with diverse learning needs, ultimately leading to better academic outcomes. Additionally, participants in Group Two *emphasized the importance of ongoing professional development and support to effectively integrate AI tools into their classrooms and ensure equitable access for all students. By staying up-to-date with the latest trends in educational technology and continuously expanding their skills, educators* in Group One have successfully navigated the challenges of integrating AI tools into their teaching practices. The support and resources provided by their school administration and district have played a crucial role in helping them leverage these tools effectively. However, *the use of AI in education has proven to be a game-changer for educators,* participants in Group Three asserted, allowing them to create engaging and personalized learning environments that cater to the individual needs of all their students.

4.2. Theme Two: Quality education

The question concerning AI's role in reducing educational disparities in underdeveloped communities. Participants in Group Two agreed that "*AI has the potential to revolutionize education in underprivileged areas by providing personalized learning experiences for students*". They emphasized the importance of utilizing AI tools to tailor education to individual needs, ensuring every student has access to quality education regardless of their background. For instance, AI-powered educational platforms can analyze students' strengths and weaknesses to create personalized study plans, helping them improve in areas where they struggle. This targeted approach can level the playing field for students in underprivileged communities who may not have access to traditional educational resources.

By leveraging AI technology in education, schools can provide more equitable opportunities for all students, regardless of their socio-economic status. These personalized learning experiences can help bridge the achievement gap and ensure every student has the support they need to succeed. In addition, AI can also help teachers track student progress more

effectively and provide targeted interventions when necessary. This data-driven approach to education has the potential to revolutionize the way we teach and learn, ultimately leading to better outcomes for all students. Participants in Group Three unraveled *the possibility of AI in education being used to track and analyze student progress, allowing educators to intervene early and provide targeted support to those who are lacking behind.* This innovative use of AI technology can potentially revolutionize how teachers approach student learning and academic success. By harnessing the power of data analysis and predictive algorithms, educators can more effectively tailor their teaching strategies to meet the individual needs of each student.

Additionally, AI in education could streamline administrative tasks, freeing up valuable time for teachers to build strong relationships with their students and foster a supportive learning environment. However, Group One participants concluded that *AI has the power to give an equal level playing field in education and bridge the gap between privileged and disadvantaged students.* Also, they believed that AI could personalize learning experiences for students, catering to their individual needs and learning styles. By utilizing AI technology, educators can better identify areas where students may be struggling and provide targeted interventions to help them succeed. This could ultimately lead to improved academic outcomes for all students, regardless of their background or circumstances.

4.3. Theme Three: Infrastructural deficiency

This theme focuses on under-resourced communities' potential challenges and opportunities in adopting AI-based educational tools. *One significant challenge is the lack of access to high-speed internet in under-resourced communities, which is necessary for utilizing AI technology effectively as it requires a strong and stable internet connection,* participants in Group Two highlighted. Without this access, individuals in under-resourced areas may be unable to take full advantage of AI capabilities, hindering their ability to stay competitive in an increasingly digital world. Addressing this issue will be crucial in ensuring that all populations have equal opportunities to benefit from the advancements in AI technology. Additionally, *the limited funding that may be available for schools in under-resourced communities to invest in these innovative tools* was attributed to participants in Group Three. *Another obstacle associated with adopting AI-based educational tools is the lack of proper training and support for teachers to integrate AI into their curriculum effectively,* participants in Group One indicated. The issue of *insecurity and corruption* was not left out which was attributed to participants in Group Two. Also, participants in Group Three raise *concerns about data privacy when it comes to using AI technology in schools.* Ensuring student data is protected and used ethically will be vital to gaining trust and support for

implementing these tools. A comprehensive approach is needed to address these various challenges and ensure that AI technology is implemented to benefit all students, regardless of their location or background. Furthermore, *AI is capable of impeding social interaction in education among students by reducing the need for face-to-face communication* participants in Group One submitted. As AI advances, students may rely more on digital platforms for learning rather than engaging in traditional classroom discussions or group work, which can improve their critical thinking skills. Again, *AI technology in education will only make students to be lazy thinkers who will want to rely solely on AI technology for most of their academic tasks,* which could hinder their critical thinking and problem-solving skills in the long run, participants in Group Two reported.

Despite these challenges, *the potential benefits of AI in education for under-resourced communities, such as personalized learning and increased student engagement, make overcoming these obstacles worthwhile,* participants in Group Three noted. Participants in Group One stated that *improving infrastructure to provide high-speed internet in under-resourced areas will be essential in bridging this digital divide.* This will require collaboration between government agencies, internet service providers, and community organizations to invest in expanding broadband access to underserved areas. Again, educating students in under-resourced communities about the benefits of AI technology and how to effectively utilize it will be vital in empowering them to leverage these tools to enhance their education and academic performance. For example, in an under-resourced town with limited internet access, a partnership between the local government, an internet service provider, and a community organization could lead to installing fibre-optic cables to improve broadband connectivity. This would enable learners to access AI technology for online learning opportunities, ultimately boosting academic development. Participants in Group Two revealed that *AI-based technology will give equal access to quality education irrespective of learner location or socio-economic status.* They emphasized that this advancement would help bridge the gap in educational opportunities and create a more level playing field for all learners. By addressing these challenges and working towards equitable access to AI technology, we can ensure that all students, regardless of their geographic location, can thrive in the digital age.

5. DISCUSSION

This study focuses on the use of AI in education to bridge the community gap among secondary school students. The study generated three themes. Theme one centred around learning assistance or individualized learning experiences. It was noted that most of the participants demonstrated that AI in education would significantly provide learning assistance to learners

by personalizing their educational experience. This personalized approach was seen to address students' varying needs and learning styles, ultimately leading to improved academic outcomes. Again, with the use of AI in education, learners in underdeveloped communities will be able to compete favourably with their counterparts in developed communities. This result was corroborated by Lokare and Jadhav (2024), whose findings demonstrated that AI models could accurately predict learning styles, allowing customized content delivery that resonates with students' preferences. In addition, the participants expressed enthusiasm about the potential for AI to offer real-time feedback and support, enhancing their overall learning process and motivation. Overall, this study highlights the positive impact that AI can have on education, particularly in fostering inclusivity and academic success among secondary school students. Other studies (Alomair, 2024; Duraes et al., 2024; Opesemowo & Ndlovu, 2024) supporting the result indicate that AI applications can lead to improved academic performance by providing real-time feedback and personalized support, which helps students stay engaged and motivated.

Furthermore, the participants noted that using AI in education helps bridge gaps in access to resources and support for students from diverse backgrounds. By providing personalized learning experiences and adaptive assessments, AI technology has the potential to level the playing field for all learners, regardless of their circumstances. This aligns with the findings of Adeleye et al. (2024); Farahani and Ghasmi (2024) unveiling AI-driven platforms facilitate collaborative learning, allowing students from different backgrounds to engage and learn together, thus breaking geographical barriers. The participants particularly praised this equity-driven approach to education and emphasized the importance of creating an inclusive learning environment where every student can thrive and succeed.

Conversely, theme two unravels that AI-based technology can improve the quality of education in underserved communities. They believed that by providing individualized learning experiences, AI could cater to student's needs and help bridge the gap in access to quality education. Subsequently, Devi et al. (2022) agreed with the findings of this theme, stating that AI can assist in bridging the gap between school and traditional grade levels. Additionally, the study reveals that AI can assist teachers in creating more engaging and interactive lessons, ultimately leading to better learning outcomes for students in these regions. Similarly, the potential of AI to enhance education in less developed communities is promising and could lead to significant improvements in educational equity and accessibility. This is particularly important as access to quality education is often inadequate in underserved communities due to various factors such as lack of resources, infrastructure, and trained educators.

AI can ameliorate these challenges by providing personalized learning experiences that cater to each student's unique needs and learning styles (Castro et al., 2024). This can help level the playing field and ensure that all students have access to the same opportunities for academic success. In addition, AI can also assist teachers in identifying areas where students may be struggling and provide targeted support to help them improve their understanding and performance (Opesemowo & Adekomaya, 2024). Ultimately, integrating AI into education in underserved communities can transform how we approach teaching and learning, leading to more equitable academic outcomes for all students. Yılmaz (2024) alluded that by utilizing AI technologies, teachers can personalize learning experiences for students, catering to their individual needs and abilities. This can help bridge the educational gap in underserved communities, ensuring all students have the support and resources needed to succeed. Moreover, Wang (2021) agreed that AI can provide valuable data and insights to teachers, allowing them to make informed decisions and modifications to their instruction in real-time.

Finally, the infrastructural deficiency was a concern uncovered in theme three. Most participants alluded that the lack of access to high-speed internet needed for AI in education is a significant challenge in under-resourced communities. This limitation hinders the implementation of AI technology in classrooms and restricts students' ability to participate in online learning opportunities. The findings align with Pradana and Josiah (2024) research, which unveils that many under-resourced areas face persistent issues with internet access, characterized by slow speeds and frequent outages, which are critical for AI applications in education. Some studies (Ahmad et al., 2024; Yetişensoy & Karaduman, 2024) have found that AI-powered educational tools may widen the education gap by favouring students who already have access to technology and resources, further disadvantaging those who are already marginalized. To address this issue, policymakers must prioritize improving internet infrastructure in under-resourced areas to ensure that all students have equal access to educational resources. Additionally, collaboration between the government, tech companies, and academic institutions is necessary to find innovative solutions to bridge the digital divide in education. At the same time, others raised the issue of data privacy.

6. CONCLUSION

AI in education can bridge community gaps by providing personalized learning experiences, improving access to sustainable development goal 4 (i.e., quality education), and fostering social integration. While the pitfalls such as data privacy, bias, and digital divide must be

addressed, the benefits of AI in creating a more equitable and inclusive education system are apparent. As AI technology evolves, it offers exciting possibilities for transforming education and bridging the gaps that separate communities. Nevertheless, AI in education can transform how students interact and learn, promoting a more interconnected globalized society. Through AI-powered tools and platforms, students can engage with peers from different communities while expanding their perspectives and understanding of the world. This interconnectivity fosters a sense of empathy and appreciation for diversity, preparing students to thrive in an increasingly globalized society. Also, AI can assist educators in identifying and addressing learning gaps, ensuring that every student receives the support and resources they need to succeed. By leveraging AI technology in education, we can create a more equitable and inclusive learning environment that empowers students to reach their full potential.

7. LIMITATIONS OF THE STUDY

One of the limits of this study is the subjective nature of phenomenological research, which relies solely on the personal experiences and perceptions of the participants. This can introduce bias as the findings are not easily generalized across several communities. Other studies can be conducted using different approaches for a generalized conclusion. Again, the qualitative nature of the study may also hinder the ability to quantify and measure specific outcomes, making it more difficult to compare findings with other studies that use quantitative methods. Lastly, the small sample size typically associated with phenomenological research may constrain the overall generalizability of the findings. Despite these limitations, phenomenological research can provide valuable insights into individual experiences and perspectives, offering a rich and detailed understanding of a particular phenomenon.

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