

# ARTIFICIAL INTELLIGENCE, MATHEMATICS EDUCATION AND ATTAINMENT OF PEACE, JUSTICE AND STRONG INSTITUTIONS (SDG 16)

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## **Abstract**

*This paper explored artificial intelligence, mathematics education, and the attainment of peace, justice, and strong institutions (SDG 16). Vygotsky's (1978) Socio-cultural Theory of Teaching, Learning, and Development was used as the theoretical framework for this survey, two objectives were raised to guide this study. The findings showed that the use of artificial intelligence in mathematics education can support SDG 16 by personalising math education, promoting access, and identifying learning gaps, thereby fostering social integration and reducing inequality. While artificial intelligence can enhance institutional accountability through data-driven insights and fraud detection, challenges remain regarding data security, algorithmic bias, and the need for robust policy frameworks to ensure responsible adoption and equitable implementation in developing regions. It was therefore recommended among others that comprehensive training programs should be developed to equip mathematics teachers with the skills and confidence to effectively use and integrate AI tools, while also enabling them to address ethical concerns that aids in the attainment of SDG 16 (peace, justice and strong institutions); clear, human-rights-based policies should be established for AI in mathematics education, addressing data privacy, security, and algorithmic accountability to build trust and ensure responsible use.*

**Keywords:** Artificial intelligence, Mathematics education and Peace, Justice and Strong Institutions (SDG 16)

## **Introduction**

Sustainable development is based on the concept of development (socio-economic development in line with ecological constraints), the concept of needs (redistribution of resources to ensure the quality of life for all) and the concept of future generations (the possibility of long-term usage of resources to ensure the necessary quality of life for future generations). The essence of the concept of sustainable development derives from the Triple bottom line concept, which implies the balance between three pillars of sustainability – environmental sustainability focused on maintaining the quality of the environment which is necessary for conducting the economic activities and quality of life of people, social sustainability which strives to ensure human rights and equality, preservation of cultural identity, respect for cultural diversity, race and religion, and economic sustainability necessary to maintain the natural, social and human capital required for income and living standards (Klarin, 2018).

Goals, however, are needed to attain sustainable development. The Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all" (United Nations, 2015). One of such goals is Peace, Justice and Strong Institutions (Goal 16). This sustainable development goal focuses on promoting peaceful, inclusive societies and providing access to justice for all by building effective, accountable, and inclusive institutions at all levels. The goal is to reduce all forms of violence, ensure access to justice, uphold the rule of law, protect human rights, and foster public participation in decision-making to create equitable and stable societies where everyone feels safe (Ibietan & Okafor, 2019; Marie-Claire & Olawuyi, 2025).

Various authors have suggested that mathematics education plays a significant role in promoting peace, justice, and strong institutions (SDG 16), as it can provide a framework for social justice, develop critical thinking to address societal problems, enable data analysis for effective governance, and foster global citizenship. For instance, integrating social justice into mathematics curricula can help students to understand and solve real-world issues related to peace and justice, making mathematics education a tool for creating a more equitable and sustainable future (Mawarti & Nurlaelah, 2020; Salmon et al., 2024). Mathematics education can also foster critical thinking and data literacy essential for informed citizenship and accountability, which are vital for building strong institutions and promoting justice. It also provides tools for statistical analysis to monitor progress towards peace and justice indicators, develops complex problem-solving skills for sustainable solutions, and builds the capacity for transparent governance and resource allocation, directly supporting SDG 16's aim of inclusive and accountable societies (Afiya et al., 2025; Yadav, 2024).

In recent times, especially in this era of digitalisation, the use of artificial intelligence in education is becoming crucial. This is because artificial intelligence (AI) enables personalised learning experiences, automates administrative tasks, and enhances teaching efficiency through intelligent tutoring systems and data-driven insights (Zacharis, 2016). AI in mathematics education could therefore support SDG 16 by developing critical thinking and ethical reasoning in students through personalised learning and simulation-based training, which prepares them for conflict resolution and responsible governance, fostering inclusive institutions and access to justice. However, it also presents challenges such as algorithmic bias and privacy risks, requiring careful governance to ensure AI promotes equity rather than exacerbating inequalities in access to knowledge and justice (Shahzad et al., 2024). Therefore, the two specific objectives of this paper were to examine various literature, reports and documents on:

The role of Artificial Intelligence (AI) in Mathematics Education for the Attainment of Peace, Justice and Strong Institutions (Goal 16); and

The challenges towards the use of Artificial Intelligence (AI) in Mathematics Education for the Attainment of Peace, Justice and Strong Institutions (Goal 16).

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## **Literature Review**

### ***Theoretical Foundation***

#### ***Socio-cultural Theory of Teaching, Learning, and Development by Vygotsky (1978)***

The socio-cultural theory of teaching, learning and development was developed by Vygotsky in 1978. This theory assumes that human minds do not develop through predetermined cognitive structures that unfold as one matures. Rather, human minds develop as a result of constant interactions with the social-material world, such as artificial intelligence (AI). According to Vygotsky (1978), the human mind develops through interaction with materials, such as artificial intelligence (AI), in the learning process, where people learn from each other and use their experiences to make sense of the materials they interact with successfully. These experiences are crystallised in 'cultural tools', and learners must master these tools to develop specific knowledge and skills to solve specific problems and ensure sustainable development, such as peace, justice, and strong institutions.

In the mathematics classroom, these tools can include a picture, a model, a pattern for solving a problem, and/or artificial intelligence (AI). Learning by using such tools is not something that simply helps the mind to develop. Rather, this kind of learning leads to new, more elaborated forms of mental functioning. For example, when children master a complex cultural tool like artificial intelligence, they derive personalised learning that fosters new levels of thinking, self-regulation, and a general mentality, which invariably impacts sustainability in society. It is the specific organisation of this tool (e.g. the semantic, pragmatic, and syntactic structures of language) that calls into being and, in effect, shapes and forms new facets of the child's mind. Importantly, cultural tools are not merely static 'things' but embodiments of certain ways of acting in human communities.

In other words, they represent the functions and meanings of things, as discovered in cultural practices: they are "objects-that-can-be-used-for-certain-purposes" in human societies. As such, they can be appropriated by a child only through acting upon and with them, that is, only in the course of actively reconstructing their meaning and function. This theory implies that use of materials such as artificial intelligence in mathematics education lead to cognitive development because they foster personalised learning, mediate learners' thinking through the tools, and such mediation constitutes the very cornerstone of mental development and attainment of sustainable development goals such as peace, justice and strong institutions in the society.

### ***Sustainable Development***

Sustainable development is a process of change in which the utilisation of resources, the direction of investments, the orientation of technological innovation and exchange and institutional change reflect both future and present needs (Bello, 2021). Sustainable development is commonly seen to require a balanced pursuit of three goods such as - ecological health, social equity, and economic welfare. It is grounded in the ethical commitment to enhanced opportunities and well-being for not only the present generation but also the future generation (Emina, 2021). Sustainable development is a process of change in which exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. The sustainable development process must reflect and be dictated by the resource base available to that society and should strive towards optimal utilisation of natural and human resources in its environment (Azuka, 2015).

### ***Sustainable Development Goals***

The Sustainable Development Goals (SDGs) are a framework of 17 goals and 169 targets across the social, economic, and environmental areas of sustainable development, to which United Nations (UN) Member States have committed to making a reality over the next 15 years. They are depicted diagrammatically below:



**Figure 1:** UN Graphical Illustration of the 17 SDGs (Source: United Nations, 2015)

One of such sustainable development goals is “Peace, Justice and Strong Institutions (Goal 16)”. This sustainable development goal focuses on promoting peaceful and inclusive societies for sustainable development, providing access to justice for all and building effective, accountable and inclusive institutions at all levels (Ibietan & Okafor, 2019). The ten "outcome targets" include: reduce violence; protect children from abuse, exploitation, trafficking and violence; promote the rule of law and ensure equal access to justice; combat organised crime and illicit financial and arms

flows, substantially reduce corruption and bribery; develop effective, accountable and transparent institutions; ensure responsive, inclusive and representative decision-making; strengthen the participation in global governance; provide universal legal identity; ensure public access to information and protect fundamental freedoms (Marie-Claire & Olawuyi, 2025).

### ***Mathematics***

Mathematics is one of the branches of knowledge that studies quantity, structure, space, and problem-solving, requiring skills in calculations and critical thinking (Kusmaryono et al., 2020). Mathematics is a branch of science that deals with numbers and their operations, revealing hidden patterns that help us understand the world we live in (Sulai & Sulai, 2020). Aduwa (2021) defined mathematics as a set of precise and logical languages that lead to interesting activities applied to everyday life. Mathematics is the language that uses carefully defined terms and precise symbolic representations which add precision to communication. Mathematics is defined as the scientific study of quantities, including their relationship, operations and measurements expressed by numbers and symbols (Yadav et al., 2021).

Mathematics is defined as the study of number, systems, shapes, symbolic language, sizes, patterns, spaces, relationships, measurement systems, shapes, symbolic language, sizes, patterns, spaces, relationships, the science of measurement, and generalisation. Mathematics is the branch of knowledge that seeks to improve on human perception of himself and his immediate environment by using clear, logical, precise and exact thinking processes (Aduwa, 2021). Mathematics as the science of logical study of numbers, shape, arrangement, quantity, measure and many related concepts. Mathematics is the study of quantity, structure, space. It seeks out patterns and uses them to formulate new conjectures. It is the science of formal systems that draws necessary conclusions (Yadav et al., 2021).

### ***Mathematics Education***

Mathematics education is a branch of scientific education that deals with the science of computation, measurement, and description of shapes and sizes of objects. Mathematics education concerns the development and dissemination of rational reasoning, structure, order, and quantitative calculation in humans. This form of education provides the foundation for advancement in science and technology, which are essential building blocks for a country's industrial and economic development (Sulai & Sulai, 2020). Mathematics education involves the teaching, learning, and assessment of formulae and systems essential for computations and problem-solving (Inah & Agbudu, 2021). Mathematics education is the practice of teaching and learning mathematics, which, over the past 20 centuries, has been part of the core curriculum in all developed countries (Onyeoghani, 2017).

Mathematics education involves imparting logical reasoning, quantitative calculation, and the science of structure, order, and relation to learners (Sulai & Sulai, 2020). Mathematics education involves learning the algorithms and formulas needed for computation and problem-solving. It is also viewed as a system encompassing aspects of teaching, learning, and the assessment of mathematics (Inah & Agbudu, 2021). Mathematics education is the act of imparting and acquiring mathematical skills, knowledge, aptitude, abilities, and attitude that make learners productive and functional towards the national development goals (Liman et al., 2016).

### ***Artificial Intelligence***

Artificial intelligence (AI) is the ability of machines or computer systems to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, perception, and decision-making. Artificial intelligence (AI) systems analyse vast amounts of data, recognise patterns, make predictions, and can even learn and improve over time without being explicitly programmed for every situation. This technology powers applications like virtual assistants, recommendation systems, and self-driving cars, and it's a rapidly evolving field with broad applications across many industries (Glover, 2025; Russell & Norvig, 2021; Stryker&Kavlakoglu, 2025). Key aspects of AI include:

Human-like capabilities: AI aims to simulate human cognitive processes to enable machines to see, understand language, reason, and make decisions.

Problem-solving: AI systems can proactively solve problems and make recommendations based on the information they process (Stryker&Kavlakoglu, 2025);

Learning from data: A core function of AI is its ability to learn from training data, identify patterns, and improve its performance over time;

Automation: AI is used to automate routine and complex tasks, freeing up human time and improving efficiency (Russell & Norvig, 2021);

Wide-ranging applications: From everyday interactions with smart devices to critical functions in healthcare, finance, and transportation, AI's impact is wide-spread (Glover, 2025; Russell & Norvig, 2021; Stryker&Kavlakoglu, 2025).

AI systems work by analysing large datasets to find patterns and relationships, then using these patterns to make informed decisions or predictions. They can learn and adapt as they are exposed to new information, making them a powerful tool for various tasks (Glover, 2025; Stryker&Kavlakoglu, 2025). Examples of AI Applications include:

1. Virtual Assistants: Such as Siri and Google Assistant, which understand and respond to human language;
2. Recommendation Systems: Used by platforms like Netflix and Amazon to suggest content and products based on user history;
3. Autonomous Vehicles: Self-driving cars that can perceive their environment and make independent decisions;
4. Generative AI: Tools like ChatGPT and DALL-E that can create text, images, and other content (Craig et al., 2024; Scott, 2025).

### ***Artificial Intelligence in Education***

Artificial intelligence (AI) in education uses intelligent computer systems to personalise learning, automate administrative tasks for educators, and provide data-driven insights to improve student support and overall learning experiences. Key applications include adaptive learning platforms that tailor content, intelligent tutoring systems offering personalised guidance, and tools that automate grading and feedback (Shan et al., 2024). Artificial intelligence enhances personalised learning by analysing student data to understand individual learning paces, strengths, and weaknesses, allowing educational platforms to customise content and activities for each student (University Canada West, 2025).

In education, AI systems such as intelligent tutoring systems can provide personalised feedback and step-by-step guidance, acting like human tutors to address specific learning gaps and offer tailored practice sessions (Nelson, 2024). Intelligent tutoring systems identify areas where students are having difficulty and offer customised treatments by examining student data and interactions. It provides tailored explanations, examples, and practice sessions to solve specific learning gaps. Intelligent tutoring systems adjust the material and pace of education to meet the student's level of knowledge, ensuring that students are properly involved (Holistic, 2023).

AI can handle repetitive tasks like grading assignments and scheduling, freeing up educators' time to focus more on teaching and interacting with students (University Canada West, 2025). AI tools provide educators and policymakers with valuable data on student performance and progress, helping to identify struggling students early and inform decision-making (Gwo-Jen et al., 2020; University Canada West, 2025). AI can assist in creating and curating educational materials, making the process more efficient and potentially more accessible (Shan et al., 2024; University Canada West, 2025).

***The Role of Artificial Intelligence (AI) in Mathematics Education for the Attainment of Peace, Justice and Strong Institutions (Goal 16)***

A paper argued that better use of machine learning, such as artificial intelligence, can significantly improve students' ability to track progress on SDG-16 and to measure the effects of changes across different SDG-16 indicators on other SDGs (Niheer & Slava, 2019). Artificial Intelligence in mathematics education helps achieve SDG 16 by fostering critical thinking and data analysis skills necessary for informed citizens and effective governance, and by providing tools to detect fraud and improve institutional transparency (Christian et al., 2025; Webb, 2025).

Artificial intelligence (AI) plays a transformative role in advancing peace, justice, and strong institutions by providing innovative solutions to complex societal challenges. In areas like conflict resolution, legal systems, and governance, AI enhances decision-making, improves efficiency, and increases transparency. AI-powered tools assist in monitoring human rights abuses, predicting conflict zones, and ensuring fair and unbiased legal processes through automated analysis of case law. It can help strengthen institutions by improving public service delivery, combating corruption, and fostering greater civic participation. As nations strive to meet the United Nations' Sustainable Development Goal (SDG) 16, further research into AI's ability becomes key to building just, peaceful, and inclusive societies (Christian et al., 2025).

AI use in mathematics education supports SDG 16 by developing critical thinking and data analysis skills. AI-powered educational tools can enhance students' ability to analyse data, solve complex problems, and think critically, fostering a more informed and engaged citizenry capable of contributing to peace and justice (Fawehinmi et al., 2025; Salisu & Samuel, 2025). AI use in mathematics education strengthens institutions through skilled workforces by developing digital literacy and workforce readiness in mathematics. AI in mathematics education contributes to building a stronger, more skilled workforce. This workforce is better equipped to manage and govern institutions effectively, and to implement responsible AI solutions (Ibomoie et al., 2024; Salisu & Samuel, 2025; Vinuesa et al., 2020).

AI use in mathematics education strengthens institutions through skilled workforces. By developing digital literacy and workforce readiness in mathematics, AI use in mathematics education contributes to building a stronger, more skilled workforce. This workforce is better equipped to manage and govern institutions effectively, and to implement responsible AI solutions (Bongs, 2024; Fawehinmi et al., 2025; Ibomoie et al., 2024; Vinuesa et al., 2020; Webb, 2025). AI use in mathematics education improves transparency and accountability. AI can be used in administrative systems to analyse data and detect patterns that indicate fraud or corruption, thereby strengthening institutional transparency and accountability. This leads to more robust and just institutions (Bongs, 2024; Vinuesa et al., 2020).

AI use in mathematics education facilitates conflict prediction and prevention. Hence, by fostering advanced analytical skills in mathematics education, AI can help develop individuals capable of analysing complex data and identifying early signs of potential conflict, enabling proactive interventions (Christian et al., 2025; Salisu & Samuel, 2025). AI usage in mathematics education can strengthen institutions in a society through the use of AI algorithms to improve the detection of fraud and using AI technology to assess the potential effects of AI on regulations (Vinuesa et al., 2020).

AI in mathematics education can promote peaceful, inclusive societies for sustainable development by personalising learning to improve equity, providing data-driven insights for effective institutions, and building digital skills for future economies. By tailoring education and providing administrative support, AI allows educators to focus on individual needs and socio-emotional support, enhancing access for diverse learners. This fosters critical thinking and workforce readiness, crucial for building strong, accountable institutions and achieving sustainable development goals (Fawehinmi et al., 2025; Kim, 2025; Singh et al., 2024).

AI offers tailored learning experiences in the mathematics classroom which allow students from diverse backgrounds to receive support aligned with their individual needs, thus addressing educational inequalities and foster a more inclusive environment (Singh et al., 2024). AI can automate administrative tasks of mathematics teachers, freeing up teachers to focus on student wellbeing and provide more individual attention in mathematics education, which is vital for fostering a supportive and peaceful educational setting needed for the attainment of peace, and strong institutions (SDG 16) (Kim, 2025; Salisu & Samuel, 2025; Singh et al., 2024).

In mathematics education, AI can help to build effective, accountable, and inclusive institutions (SDG 16) through Data-Driven Decision-Making. AI's data analysis capabilities provide valuable insights that can help institutions make more informed decisions, leading to more effective and accountable governance (Kim, 2025; Salisu & Samuel, 2025; Singh et al., 2024; Okoye & Mante, 2024; Wolniak & Stecuła, 2024). Artificial intelligence (AI) and mathematics can significantly contribute to Sustainable Development Goal (SDG) 16 by enhancing transparency, reducing violence, and combating corruption through tools such as fraud-detection algorithms and predictive analytics for crime, as well as by promoting access to justice and fostering effective, accountable institutions. Mathematics provides the foundational models for these AI applications, while AI offers the computational power to process large datasets and identify patterns that support the goal's aims of peace, justice, and strong institutions (Stoykova, 2025; Webb, 2025).

Mathematical models, such as the Beneish M-Score, can detect financial fraud, and AI algorithms can analyse vast datasets to identify patterns indicative of corruption and illicit financial flows, thus strengthening institutional transparency (Stoykova, 2025). AI can analyse crime data and other metrics to identify trends, predict high-risk areas, and develop strategies to reduce violence, contributing to Target 16.1 which aims to significantly reduce all forms of violence (Webb, 2025). By analysing institutional performance data and identifying areas of inefficiency or weakness, AI can help in developing more effective, accountable, and transparent institutions at all levels (Ozili, 2025; Webb, 2025). AI can be used to develop tools and platforms that improve access to justice for all, including by analysing legal data, providing automated legal assistance, and making legal information more accessible to marginalised communities (Webb, 2025).

AI and advanced mathematical techniques can be applied to combat organised crime by analysing financial transactions, identifying networks, and supporting investigations into illicit flows of money and arms. Mathematics and AI can help in systems that provide legal identity for all, such as birth registration, which is a target under SDG 16 (Ozili, 2025; Stoykova, 2025; Webb, 2025). AI in mathematics education can indirectly reduce societal violence by fostering critical thinking, problem-solving, and digital literacy in students, which are essential for economic growth and workforce readiness. These skills are foundational for addressing complex societal challenges and fostering innovation (Fawehinmi et al., 2025; Lara et al., 2025; Thiago, 2025; Wen, 2025). These skills are also vital for understanding complex legal frameworks and for participating in a democratic society under the rule of law to promote peace, justice, and strong institutions (SDG 16) (Aballa et al., 2024; Ogu & Okechukwu, 2024).

By providing personalised learning and improving teacher strategies, AI can reduce learning anxiety and make abstract concepts more accessible, potentially fostering a more equitable and skilled workforce (Fawehinmi et al., 2025; Lara et al., 2025; Thiago, 2025; Wen, 2025). A more skilled and economically empowered population is often linked to greater social stability (Fawehinmi et al., 2025; Galdames, 2025). Furthermore, reduced anxiety in students will lead to improved overall academic achievement, which can positively impact a student's self-esteem and social development (SDG 16) (Lara et al., 2025; Polydoros et al., 2025). AI has the potential to support differentiated instruction and provide personalised support for students with diverse backgrounds and learning needs, potentially narrowing achievement gaps and promoting equity in education (Lara et al., 2025; Wen, 2025).

By making advanced mathematical concepts more accessible, AI can equip a broader segment of the population with the cognitive tools needed to foster civic engagement by engaging with complex societal issues, including those related to justice and rights (Connor, 2025; Vázquez-Parra et al.,

2024). AI platforms can provide personalised learning experiences, adaptive feedback, and targeted support, addressing diverse learning needs and helping to close achievement gaps. This promotes equitable access to quality mathematics education for all students, regardless of their background. AI tools can provide access to virtual tutors, instant feedback, and comprehensive learning resources, which can be particularly beneficial for students in underserved or remote areas (Aballa et al., 2024).

For many, math provides a foundational understanding of data, patterns, and logical structures that are also relevant to understanding legal information and the justice system. Improved math education through AI can therefore indirectly enhance access to justice by preparing individuals for roles and processes within the legal system (Emejuo et al., 2025; Thorat, 2024). A strong mathematical education, enhanced by AI, creates individuals who can create and manage the AI tools necessary to detect and prevent organised crime, thereby combating illicit activities effectively. AI-driven mathematics education can foster the skills for AI to analyse vast financial datasets, detect financial fraud and money laundering patterns, track illicit arms flows by identifying unusual transactional patterns, and predict emerging criminal threats by analysing historical data (Folajimi, 2024; Pavlidis, 2022).

### ***The Challenges towards the Use of Artificial Intelligence (AI) in Mathematics Education for the Attainment of Peace, Justice and Strong Institutions (Goal 16)***

While beneficial, the use of AI in mathematics education and the attainment of SDG 16 also raises concerns about bias in AI systems, the potential for misuse in surveillance, and the need for responsible governance to ensure these technologies are used ethically and do not exacerbate existing inequalities. It is therefore crucial to ensure that AI tools themselves are free from biases to avoid perpetuating or exacerbating existing societal disparities (Ametepey et al., 2024). Furthermore, the absence of comprehensive national policies, clear regulations, and ethical frameworks to guide the responsible integration of AI in education creates uncertainty (Eden et al., 2024; Salisu & Samuel, 2025).

As Vinuesa et al. (2020) discussed, however, there are concerns about privacy and security regarding the incorporation of AI technology into institutions, making adoption unlikely any time soon. AI implementation in mathematics education thus raises ethical questions regarding data privacy, ownership, and the potential for misuse. The development and deployment of AI in education must be guided by strong ethical considerations to protect privacy and ensure equitable outcomes (Gabriel et al., 2025).

Potential risks, such as increased dependence on technology and the potential for increased inequality, require balanced approaches and thoughtful policy to ensure AI integration supports, rather than hinders, holistic development and social good (Fawehinmi et al., 2025; Lara et al., 2025; Thiago, 2025; Wen, 2025). An over-reliance on AI tools in the mathematics classroom can lead to a decrease in students' self-confidence, critical thinking, and creative abilities which can hinder the attainment of SDG 16 such as strong institutions (Fawehinmi et al., 2025; Wen, 2025).

Also, the benefits of AI in education may not reach all students equally, potentially widening educational inequalities if access and oversight are not carefully managed. Limited access to AI technologies in many low-resource settings exacerbates the digital divide, preventing equitable participation in AI-enhanced education (Salisu & Samuel, 2025; Thiago, 2025). Furthermore, educators need adequate training to use AI tools in the classroom effectively. Inadequate training and professional development for teachers to effectively use and integrate AI tools limit their potential for positive impact and can hinder institutional capacity-building (Eden et al., 2024; Wahab & Oduola, 2024).

A lack of necessary technical infrastructure, including reliable power supply, hinders the effective use of AI systems in classrooms (Eden et al., 2024). Biases in AI algorithms can perpetuate existing social inequalities, directly contradicting the goals of justice and fairness in education. There is also the issue of data inequity, where a lack of diverse, fair data used to train AI systems can lead to biased outcomes and disproportionately affect certain student groups (Salisu & Samuel, 2025;

University Canada West, 2025). A lack of quality data on marginalised groups makes it difficult to identify and address specific barriers, hindering efforts to promote inclusivity and equity (Bulathwela et al., 2024). AI systems still struggle to handle complex, proof-based, or creative mathematical problems, limiting their comprehensive role in higher-level mathematics education (Vishan, 2025).

## **Conclusion**

This paper has shown that artificial intelligence can support SDG 16 by personalizing math education, promoting access, and identifying learning gaps, but this requires addressing ethical issues like algorithmic bias, data privacy, and the digital divide to ensure equitable access and to prevent reinforcing math education, promoting access, and identifying learning gaps, but this requires addressing ethical issues such as algorithmic bias, data privacy, and the digital divide to ensure equitable access and prevent the reinforcement of existing inequalities. Achieving strong institutions and peace requires responsibly deploying AI in education through infrastructure development, teacher preparedness, and ethical policies to foster equitable, resilient, and inclusive educational systems.

## **Recommendations**

The following recommendations were therefore proffered:

1. Comprehensive training programs should be developed to equip mathematics teachers with the skills and confidence to effectively use and integrate AI tools, while also enabling them to address ethical concerns that aids in the attainment of SDG 16 (peace, justice and strong institutions);
2. Clear, human-rights-based policies should be established for AI in mathematics education, addressing data privacy, security, and algorithmic accountability to build trust and ensure responsible use;
3. Improved digital infrastructure should be advocated, including reliable internet access and necessary hardware, and sufficient funding to support the sustainable adoption of AI in mathematics education;
4. The need for AI tools to complement, not replace, human interaction and pedagogical expertise, should be emphasised ensuring that traditional teaching methods remain valuable and accessible.

## **Implications**

Artificial intelligence in mathematics education has implications for Goal 16 (Peace, Justice, and Strong Institutions) by increasing educational equity and access through personalised learning and automated tools, which fosters social integration and reduces inequality. While artificial intelligence can enhance institutional accountability through data-driven insights and fraud detection, challenges remain regarding data security, algorithmic bias, and the need for robust policy frameworks to ensure responsible adoption and equitable implementation in developing regions.

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