International Research Journal of Business and Social Science

Volume: 11 Issue: 3
July-September, 2025
ISSN:2411-3646

International Research Journal of Business and Social Science
Volume: 11, Issue: 3, 2025

KMF Publishers http://irjbss.net/

DOI: https://doi.org/10.5281/zenodo.16894762

Research Article

KMF Publishers
http://irjbss.net/

OPEN ACCESS

Role of Artificial Intelligence in Sustainable Development Goal on Health & Education

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ABSTRACT

The United Nations' Sustainable Development Goals (SDGs) emphasise the importance of good health and well-being (SDG 3) and quality education (SDG 4) for achieving sustainable development. Artificial Intelligence (AI) has emerged as a key enabler of these SDGs, offering innovative solutions to improve access, quality, and outcomes in education and healthcare. In education, AI can enhance personalised learning, automate grading, and provide real-time feedback, leading to improved student outcomes and increased access to quality education. AI-powered adaptive learning systems can also help address learning disparities and promote inclusive education. In healthcare, AI can improve disease diagnosis, predict patient outcomes, and optimise treatment plans, leading to better health outcomes and improved quality of life. AI-powered chatbots and virtual assistants can also enhance patient engagement, improve health literacy, and support preventive care. However, the integration of AI in education and healthcare also poses challenges, including ensuring equity, addressing bias, and protecting sensitive data. To harness the potential of AI in achieving SDGs-3 and SDGs-4, it is essential to develop and deploy AI solutions that prioritise human well-being, equity, and sustainability.

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ARTICLE HISTORY

Received 15 April 2025
Revised 20 May 2025
Accepted 27 June 2025

KEYWORDS

Sustainable Development Goals, Artificial Intelligence, Education, Healthcare, Personalised Learning, Disease Diagnosis, Patient Outcomes, Equity, Bias, Data Protection

INTRODUCTION

Sustainable Development Goals (SDGs) given by the UN provide indicators and guidelines for countries to promote sustainable development (UN, 2015). There are 17 goals, which include all 169 targets and 249 measurable key indicators. The United Nations' Sustainable Development Goals (SDGs) emphasise the importance of good health and well-being (SDG 3) and quality education (SDG 4). Artificial Intelligence (AI) has emerged as a key enabler of these SDGs, offering innovative solutions to improve access, quality, and outcomes in education and healthcare. In education, AI can enhance personalised learning, automate grading, and provide real-time feedback, leading to improved student outcomes and increased access to quality education. In healthcare, AI can improve disease diagnosis, predict patient outcomes, and optimise treatment plans, leading to better health outcomes and improved quality of life.

OBJECTIVE

- To harness the potential of AI in achieving SDGs-3 and SDGs-4.
- To develop and deploy AI solutions that prioritise human well-being, equity, and sustainability for these goals.

METHODOLOGY

For this study, secondary information has been collected through several research papers and analysed thoroughly. Keywords like sustainable development, Artificial intelligence, Education, and Health issues and challenges were used to find research articles.

DISCUSSION

Sustainable Development Goals of good health and well-being (SDGs-3) and Quality education (SDGs-4), use of artificial intelligence, challenges and opportunities are discussed in detail in this article. In the present scenario, with the advancement of technology, artificial intelligence is emerging as a tool in all fields. The main emphasis is on the sustainable development targets to be achieved by 2030, and how Artificial intelligence can assist in attaining these targets.

In healthcare, AI can improve disease diagnosis, predict patient outcomes, and optimise treatment plans, leading to better health outcomes and improved quality of life. AI-powered chatbots and virtual assistants can also enhance patient engagement, improve health literacy, and support preventive care. AI algorithms can assist in the early detection of diseases such as malaria and tuberculosis, leading to timely interventions and better health outcomes (Mubangizi, 2023). In education, AI can enhance personalised learning, automate grading, and provide real-time feedback, leading to improved student outcomes and increased access to quality education. AI-powered adaptive learning systems help in addressing learning disparities and promote inclusive education. AI-driven personalised learning systems meet the individual student needs, improve learning outcomes and increase accessibility to maximum (Ekirapa, 2023). It has

been observed that virtually no research has been undertaken, no guidelines, no policies, and no regulations have been enacted to address the specific ethical issues raised by the use of Artificial Intelligence in Education (Holmes et al., 2018). In case of healthcare AI policy strategies, consider ethical issues such as privacy, informed consent, black-box algorithms, and influence of AI in physician–patient interaction (Char et al., 2018).

Good Health and Well-being (SDGs-3)Targets:
SDGs-3 is to ensure healthy lives and promote well-being for all at all Ages. SDGs Goal-3 are given below as:

- Target 3.1: Reduce maternal mortality
- Target 3.2: End preventable deaths of newborns and children
- Target 3.3: Combat communicable diseases
- Target 3.4: Reduce non-communicable diseases (NCDs)
- Target 3.5: Strengthen prevention and treatment of substance abuse
- Target 3.6: Reduce road traffic accidents
- Target 3.7: Ensure universal access to sexual and reproductive healthcare services
- Target 3.8: Achieve universal health coverage (UHC)
- Target 3.9: Reduce the impact of environmental pollution
- Target 3. a: Increase research and development (R&D) for health
- Target 3.b: Support healthcare workforce in developing countries
- Target 3.c: Improve access to essential medicines and vaccines

Artificial Intelligence (AI) assists in meeting all these 12 targets of SDG-3. Machine learning algorithms can analyse vast datasets, identify patterns, and give more accurate diagnoses and timely interventions. AI-powered predictive analytics has improved public health by forecasting disease outbreaks. Machine learning algorithms decode diverse medical data, reveal patterns, predict disease severity, and inform decision-making. NLP facilitates language comprehension, supports voice recognition, chatbots, and assists in medical science. Computer vision enhances image interpretation, and AI, along with robotics, aids in healthcare. With the help of AI, we can predict drug interactions and disease outbreaks. AI helps in diagnostics, identifying diseases accurately, and advancing personalised medicine through thorough genomic analysis.

Quality Education (SDG-4)Targets:
SDG 4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. SDGs Goal 4 is given below:

- Target 4.1: Ensure Free, Equitable Quality Primary/Secondary Ed
- Target 4.2: Quality Early Childhood Development:

- Target 4.3: Equal Access/Affordable/Quality Education:
- Target 4.4: Increase Relevant Skills for Employment:
- Target 4.5: Eliminate Gender Disparities:
- Target 4.6: Achieve Literacy & Numeracy:
- Target 4.7: Education For Sustainable Development:

By 2030, there should be an increase in the number of youth and adults with technical and vocational skills for employment, individual startups, and entrepreneurship. All youth adults, both men and women, should achieve literacy and numeracy, and all learners should acquire the knowledge and skills needed to promote sustainable development. Gender disparities in education have to be eradicated. The goal of equal access to all levels of education and vocational training for vulnerable, disabled persons, and indigenous peoples is also included. Ensure that we adopt sustainable lifestyles, work for human rights, and gender equality. Along with these targets, the promotion of a culture of peace and non-violence, global citizenship, and cultural diversity. AI-driven MOOCs offer scalable, interactive learning experiences, and AI-driven simulations enable students to engage in immersive, interactive learning. With AI-driven technology such as natural language processing (NLP) and machine learning (ML), organisations can quickly assess job candidates' qualifications and skills. Natural Language Processing (NLP facilitate language learning, language assessment, and language support services. AI can be leveraged to identify patterns in data that indicate gender disparities in educational opportunities, enabling steps to be taken to address these issues. NLP and ML can help facilitate literacy and numeracy. The commonly used model of GPT-3 is ChatGPT, which is an optimised interface for interactive discussion with humans or other chatbots. It can store the previous interactions and previous inputs and provide context-specific responses. OpenAI has four models within the GPT-3 model family. These AI tools are transforming the education sector, enhancing teaching, learning, and research. Many research tools are assisting in paraphrasing, plagiarism checking, grammar checking, content writing, and citing references. Meta AI, Quillbot, Turnitin, Zotero, Mendeley, LaTex, EndNote, etc., are commonly in use. AI-facilitated collaboration platforms enable researchers to connect with colleagues, share resources, and work together more effectively.

CHALLENGES

Artificial intelligence has several benefits in various sectors, including education and healthcare, in all developed and developing countries. It has increased the efficiency of tasks and saved time and labour; however, this technology is in its budding stage and is facing many challenges. AI in education and healthcare also poses challenges, including ensuring equity, addressing bias, and protecting sensitive data. AI must be fair and transparent; otherwise, biased

and discriminatory AI adoption models cannot protect the Sustainable Development Goals.

Challenges in the health sector

- Despite these advancements, the successful deployment of AI in healthcare faces challenges in maintaining data quality and privacy concerns, poor infrastructure, ethical issues and AI-driven decision making (Kiguli, 2023).
- Sometimes technology may not work with enough accuracy or may create biases that can lead to wrong diagnoses and unequal access to healthcare services.
- There may be a risk of data privacy violation due to the collection and storage of patient information in these systems.

There is a need to ensure AI is well-regulated, fair, accessible and ethical. There is a need for equal access to AI tools, applications, and infrastructure, including good data and computing resources, capacity building and technological change. AI's presence in healthcare raises ethical and societal worries (Murphy, K., Di Ruggiero, E., Upshur, R., et al.,2021).

Challenges in the Education sector:

- There will be a rise in the percentage of students attaining basic reading skills from 51 per cent in 2015 to 67 per cent by 2030, as targets set by the National Education Goals. By 2030, about 300 million children and young people will still lack basic numeracy and literacy skills.
- Information and communications technology (ICT) skills are poor. Lack of education and training focused on artificial intelligence and other technologies. Lack of infrastructure and skill.
- Diverse population with different economic and social status, languages and cultures. Disparities in access to digital tools and internet connectivity pose significant barriers to the widespread adoption of AI in education (Deep Learning Indaba, 2023).

AI in education (AIED) should be used with wisdom and ethics as it impacts the diversity of the population with different languages, economic status and culture. In AI policy, issues related to cultural sensitivity and awareness are not given much priority (Schiff et al., 2021). India's AI policy strategy is focusing on how to fill the gap in culturally-sensitive AIED, such as the plurality of languages and the variance in citizens' digital literacy. The main objective of ongoing research is now to identify and mitigate biases through best practices (Chatila & Havens, 2019).

SUGGESTIONS

- AI can be utilised to achieve sustainable development goals without any damage

(Marjan et al, 2023). Ethical and equitable use of AI should be adopted (United Nations, 2023; Deep Learning Indaba, 2023).

- There should be a collaborative approach with responsible development and culturally respectful solutions while supporting locally produced data (Walugembe & Onyango, 2024). Government, private sector, and international partners should work in collaboration to build and enhance infrastructure, invest in education and training, and develop robust governance.
- AI-focused workshops and training programs should be implemented to build local capacity and ensure equitable access to AI technologies. Specialised training programs and workshops should be conducted to train teachers and students. The power, speed, and impact of AI are real in the world, and accountability should be fixed.
- The benefits and opportunities of AI must be for the benefit of the general public, and the digital divide should be avoided (Walugembe & Onyango, 2024). Set up institutes that can provide job training and internship opportunities without any discrimination to all.
- There should be a provision to equip students and job seekers with the skills needed to work. They can switch jobs that require skills for AI-focused industries. Development of curricula and certifications that meet the needs of business and professionals with the necessary skills to develop and manage AI technologies (Ekirapa, 2023; Deep Learning Indaba, 2023).

CONCLUSION

In healthcare, AI can help in early diagnosis of disease, predict patient outcomes, and optimise treatment plans, leading to better health outcomes and hence help in improving quality of life. AI reduces the rate of maternal mortality by using predictive analytics and detecting diseases in infants, helping to prevent deaths in newborns. AI provides improved accuracy in diagnosing infectious diseases such as AIDS, tuberculosis, and identifies individuals who are at higher risk of developing non-communicable diseases (NCDs) such as diabetes, cancer and cardiovascular diseases. The Sustainable Development Goal aims to provide free, equitable and quality education to boys and girls by 2030, ensuring that they acquire the knowledge and skills they need for sustainable development, and eliminating all gender discrimination in education. Workshops and training programs on the use of AI in education should be conducted. The benefits and opportunities of AI must be open to ordinary people, and steps should be taken to reduce or remove the digital divide. There is a need for continued global commitment to ensuring inclusive and equitable education for all. Measures such as making education free and compulsory, increasing the number of teachers,

improving basic school infrastructure and embracing digital transformation and application of AI tools are essential.

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