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The Ethical Application of Generative Artificial Intelligence in Supporting Education for Sustainable Development Globally

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Abstract

There is an urgent need to accelerate progress towards the achievement of the United Nations Sustainable Development Goals and while a majority of these are currently severely off-track, it is critical that the transformational power of education is harnessed to support their advancement. It is essential that people are empowered through education which will in turn advance sustainable development worldwide. Digital technologies including artificial intelligence (AI) and generative-AI are evolving rapidly and are having a profound impact on education including on teachers, learners and researchers. There is an urgent need to responsibly leverage these technologies to positively support Education for Sustainable Development while there is also extremely important to understand the limitations and risks of such technologies. Strong multi-stakeholder partnerships will be essential to ensure that new and innovative AI-based technologies can be harnessed to their full potential in an ethical and human rights-based manner. This will both broaden the accessibility and enhance the delivery of quality education for sustainable development globally.

Education, Human Rights & Sustainable Development

A number of decades ago, Nelson Mandela said that "Education is the most important weapon which you can use to change the world". These words have endured to this day and have become even more relevant in light of the immense challenges posed by sustainable development globally. The United Nations Sustainable Development Goals (SDGs), also referred to as the Global Goals, are "a call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity" by the year 2030 (UNDP, 2023). However, recent reports have indicated that only 15% of the SDG targets are on track to be achieved by their proposed deadline of 2030, while the remainder are either off track or have stagnated or regressed below the 2015 benchmark (United Nations, 2023a; Nyhan & Cryan, 2023).

In light of this, it is critical that the transformational power of education is harnessed for achieving the SDGs and it is essential that populations are empowered through education to advance sustainable development worldwide. Education for Sustainable Development recognizes the need for education to address growing sustainability challenges and further acknowledges that education and sustainable development are intrinsically linked. Accordingly, education must include sustainable development and indeed sustainable development must comprise education (UNESCO, 2020; Dollin et al., 2022).

Education is a fundamental human right as set out in Article 26 of the United Nations Declaration on Human Rights (United Nations, 2023b). Furthermore, within the United Nations SDGs, SDG 4 strives "to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by the year 2030" (UNDESA, 2023). Targets set out under SDG 4 include ensuring equitable access to quality education for boys and girls; ensuring equal access to quality technical, vocational, and tertiary education including universities for women and men; increasing the acquisition of skills for employment, decent jobs, and entrepreneurship; and, ensuring that people acquire the knowledge and skills required to promote sustainable development (UNDESA, 2023).

New & Emerging Technologies to Support Education for Sustainable Development

New technologies have become central to the delivery of education, and this has been driven largely by the emergence of the digital revolution, information and communication technologies (ICTs), internet connectivity, online learning environments, and artificial intelligence (AI) (McKinsey, 2022). Digital technologies have, in many instances, greatly improved the accessibility of educational resources and have supported sustainable development (Haleem et al., 2022; Souza et al., 2022). According to UNESCO (2023a), "digital technology has become a social necessity to ensure education as a basic human right, especially in a world experiencing more frequent crises and conflicts" while Nyhan & Marshall (2023) go further to suggest that "new and emerging technologies offer significant potential for rapidly accelerating the delivery of education for sustainability that is scalable, global, inclusive, ethical and equitable".

Breaking Through the Next Frontier: Applying Artificial Intelligence in Education

AI and generative-AI technologies are evolving rapidly and are having a profound impact on the education system including on teachers, learners and researchers (UNESCOb, 2023; Abulibdeh et al., 2024). Generative-AI "is an artificial intelligence (AI) technology that automatically generates content in response to prompts written in natural-language conversational interfaces" (UNESCO, 2023b). Generative-AI has the potential to support educational experiences and opportunities in terms of personalized learning, intelligent tutoring systems and assessment automation (Abulibdeh et al., 2024). According to Kamalov et al., (2023), it can enhance learning outcomes, improve time and cost efficiencies, and it can support global access to high-quality education. AI, data analytics and machine learning, when used optimally can support educators in delivering engaging and immersive educational and assessment experiences. Generative-AI can increase the effectiveness of teaching and provide conditions within which learners can thrive. Instead of being displaced by these new technologies, the educator's role has been redefined and enhanced (UNESCO IITE, 2020). For example, by using generative-AI to analyze sources of information including existing curricula, emerging topics and new learning opportunities, newly developed insights can be used to prepare new curriculums, syllabuses, and personalized programs of learning. It can save educators considerable amounts of time in researching and synthesizing such information. Generative-AI can also support effective collaboration between program directors, teachers, and other educational staff in the design and delivery of personalized programs of learning based on shared sets of learning outcomes (UNESCO IITE, 2020).

In terms of the adoption of AI in education, online education providers are increasingly incorporating generative-AI into existing online educational technology platforms and interactive virtual learning environments. For example, AI-based adaptive and intelligent tutors have been integrated into platforms for learning languages and these can generate conversations and provide immediate individualized feedback and recommendations to learners. Other online learning platforms have incorporated AI-based virtual chatbot tutors into virtual learning environments and these can offer personalised challenges for learners, responses to questions, instantaneous feedback, and encouragement (Kamalov et al., 2023; Singer, 2024). Such technologies will likely be incorporated into many other educational platforms, bringing challenges for teachers in terms of integrating these with learning outcomes and pedagogical approaches. As such, the training of educators in new innovative pedagogical approaches is important.

The OECD has highlighted the importance of equipping students with the skills and knowledge they require to succeed in an increasingly complex and fast-changing world of work. This includes developing critical thinking, problem-solving, creativity and digital literacy skills (OECD, 2023). Some educational systems have seen a reluctance to move away from traditional methods of teaching, learning and assessment. However, given the accelerated adoption of AI throughout society, traditional teaching and learning methods may not prepare learners for a modern technologically driven world and as such, there is a need to embrace technologies in the educational sphere.

Ethics, Artificial Intelligence & Education for Sustainable Development Globally

The responsible and ethical use of AI-based technologies including generative-AI in education is of paramount importance, however, the long-term impacts of these technologies are not well understood. Ethical issues and uncertainties include those related to access and equity, human connection, human intellectual development, psychological impacts, data privacy, transparency, hidden bias, and discrimination (UNESCO, 2023b; Mhlanga, 2023; Abulibdeh et al., 2024). As such, there is an urgent need for more research in these areas. Policymakers and educators should investigate further any potential risks and ensure that AI-based educational technologies are designed in an ethical and human rights-centered way and that they do not impact adversely on people and especially the most vulnerable in society.

There is no doubt that AI is one of the defining technologies of our time and is having a substantive impact on education. However, a major challenge includes how best to extend the benefits to all educators, learners and researchers while also ensuring the technologies are applied in an ethical and responsible manner (Mhlanga, 2023). Although more people than ever are connected to the internet, the digital divide is still pervasive globally and a third of humanity, or 2.6 billion people, remain offline (ITU, 2023). Internet connectivity has proven essential for fostering inclusive societies, for boosting economic development and for broadening access to education. As such, digital infrastructure needs to be in place and services need to be affordable and accessible so that populations wishing to avail of them can do so. It is also

important to consider frameworks and governance structures which can support equitable and fair access to digital technology infrastructure, services and capabilities (O'Sullivan et al. 2021; Clark et al., 2022).

Strong multi-stakeholder partnerships will be essential to ensure that the necessary infrastructure and services are in place and that innovative AI-based technologies can be harnessed to their full potential in an ethical and human rights-based manner. This will both broaden the accessibility and enhance the delivery of quality education. These partnerships will include governments, international organizations, non-governmental organizations, technology companies, educational institutions, and civil society. Along with partnerships, robust regulatory frameworks will be necessary to ensure the ethical application of AI-based technologies in education. These will in turn ensure that AI-based technologies are responsibly leveraged to support Education for Sustainable Development and more accelerated sustainable development worldwide.

Key Policy Recommendations

- It is critical that the transformational power of education is harnessed for achieving the United Nations Sustainable Development Goals. It is essential that people are empowered through education which will in turn advance sustainable development worldwide.
- Digital technologies including AI and indeed generative-AI technologies are evolving rapidly and are having a profound impact on education. There is an urgent need to harness these technologies to positively support education for sustainable development while there is also an urgent need to understand the limitations and risks of such technologies.
- Strong multi-stakeholder partnerships will be essential to ensure that new and innovative AI-based technologies will be harnessed to their full potential and in an ethical and human rights-based manner to both broaden accessibility and enhance the delivery of quality education for sustainable development globally.

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