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How Artificial Intelligence (AI) impacts inclusive education

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Since artificial intelligence (AI) is extensively used in the field of education, it presents various opportunities in teaching and learning. In education, AI is chiefly used to impart knowledge, stimulate comprehension, heighten intelligence, and is treasured as support in learning. It is also instrumental in empowering and inspiring students. The emergence of AI also has a positive impact on inclusive education. Because these technologies can potentially transform teaching and learning, it is important to understand how they can be used to further support inclusive education. This non-empirical research analyzed some advantages and challenges of incorporating AI in teaching and learning and highlighted how it influences inclusion. Based on the literature, some of the advantages of AI are improved performance of students, motivation, and encouragement of students. This review also identified some challenges associated with the use of AI for inclusive education, such as technological difficulties, poor connectivity, pedagogical issues, and limitations of the database. Some recommendations are proposed to address these challenges. This research can assist educators, parents, students, government officials, and policymakers in making proper decisions on the effective use of AI and inclusion.

Key words: Artificial intelligence, new technologies, inclusive education, inclusion, diversity, equity, equality.

INTRODUCTION

The emergence of artificial intelligence (AI) influences almost every facet of education and is also accepted and valued by educators (Chen et al., 2020; Hwang et al., 2020). The regular use of AI in education can be considered one of the most decisive developments of the century (Becker et al., 2018; Seldon and Abidoye, 2018). In general, AI is widely utilized and considered a powerful tool to facilitate and enhance teaching and learning. Holmes et al. (2023) and Hwang et al. (2020) suggested that it is also instrumental for instructional design, technological development, and educational research. It

is an undeniable fact that the integration of AI in education transforms teaching and learning. In addition to making learning more personal, AI offers proper feedback, and this impels a more inclusive and effective learning environment. Inclusive education is significant but also demanding because the inclusion of all students in the mainstream system requires adequate care, attention, and possible modifications to the curriculum. Some of these changes concern technological, organizational, methodological, moral, psychological, and other parameters. Holmes et al. (2019) cautioned that

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although AI is expedient and can transform education, desirable educational outcomes do not occur by merely using AI computing technologies. According to Castañeda and Selwyn (2018), the inclusion of AI in education alters teaching and learning, and it is necessary to have a comprehensive understanding of the effects on the current education system to ascertain and arrive at a sustainable development and deployment of the use of AI technologies in schools. Thus, this research tries to investigate the impact of AI on inclusive education through a review and analysis of the existing literature. Mention must be made that when this research was conducted, a review of the literature revealed that very few studies explicitly examined the impact that AI has on inclusive education and the different benefits and functions of AI in inclusion. To address the gap, this non-empirical research presented a critical overview of how AI impacts inclusive education. The main objective was to summarize the major paradigms with descriptions of relevant theoretical foundations, conceptual research, and practical implementations. It also offered a reference framework for future research. The following research questions guided this research: Is there a relationship between AI and inclusion? What precisely is inclusion? Is there value and merit in inclusive education? What exactly is inclusive education? Is there value and merit in inclusive education? There is very little information about inclusive education, and inclusion does not only mean that students study in the same classroom. A proper inclusive environment ensures that teaching and learning maximize the abilities of students. This is a daunting task, and many educators fail to meet the various needs of students. It is against this background the research questions were designed.

LITERATURE REVIEW

Inclusive education

The United Nations (2017) affirmed that the fundamentals of inclusive education consist of upholding morals, both religious and non-religious, norms, perspectives, and practices that facilitate all students with relevant and worthwhile education. They further emphasized that one of the objectives of inclusion is to afford all students with equal educational opportunities. The United Nations (2017) also resolutely asserted the tenets and principles of inclusion and held them in high esteem. Inclusion permits different communities to live together for the benefit and well-being of all. Inclusive education does not discriminate and cast aspersions. The fundamental principle of inclusion is to embrace all students regardless of color, race, ethnicity, geographic location, or disability. Dalton (2017) declared that a holistic approach to education must incorporate all students for effective and meaningful inclusion. Thus, inclusion welcomes all students even those with grave disabilities,

those with hearing and visual impairment, those with physical and mental learning disabilities, as well as the gifted and talented. This is convoluted but not impossible since inclusion could probably frequently increase motivation and morale among students. Some strategies can assist all students to learn, but some specific strategies are useful in teaching a group that includes students with a mental health condition. Inclusive education is a process contributing to the achievement of the goal of social inclusion. Mag et al. (2017) resolutely suggested that inclusion should try at all costs to incorporate children of various ethnicities and cultural backgrounds.

Therefore, an inclusive environment should be nurturing and, above all, safeguard children from harm and strive to educate all. Educators must do their best to ensure students receive adequate education. Hence, the curriculum should be revised to cater to the needs of all students. Mag et al. (2017) also affirmed that suitable opportunities must be afforded so that all students are free to optimize their aptitude. Inclusive education resolutely affirms the following principles: acceptance, accessibility, and assessment reform. Inclusion is firm in its resolve that students must feel comfortable and relaxed and experience a great sense of belonging and satisfaction. To achieve these goals and objectives, educational institutions are obligated to acknowledge, recognize, and make the necessary modifications to address the needs of all students. This means that educators must know their students very well and be willing to adapt the delivery of the curriculum if necessary.

Nurdyansyah et al. (2022) indicated that numerous barriers still prohibit educators from successfully using modern technology in the classroom to promote inclusion. Some educators are not even competent in using technology, while others lack basic teaching strategies and skills. They further believed that some digital materials, such as those designed for assistive technologies, may be neither compatible nor accessible. Bartz (2020) and Fitchen et al. (2009) stated that there are times when content is not well organized when it is presented, and this can greatly hamper inclusion. This, in turn, can inhibit academic progress for students who rely on assistive technology or those who have disabilities and issues with learning attention.

There is also an urgent need to eradicate impediments to learning because some schools are still unwilling to accept students with special needs. Many educators are also unaware of students with disabilities and may not have the most suitable attitude to address their needs. Some educators are not properly trained to address issues with disabilities.

Because classes are overcrowded, many students cannot secure the attention they deserve. Thus, the entire education process is gravely hindered, and teaching and learning are not student-centered. A great

number of educational institutions have inadequate infrastructure, thereby prohibiting students from accessing the relevant tools needed to cater to their learning needs. Insufficient resources also pose major hurdles, along with a lack of parental and community involvement. Similarly, poor communication and minimal support among peers, parents, educators, schools, stakeholders, and even the Ministry of Education are repeatedly at the forefront. Makwana (2022) stated that labeling is also a form of discrimination because it classifies students based on their disability, and this works contrary to inclusion. It is not uncommon that many children with special needs do not like to be set apart because they feel rejected. This issue of branding students is an urgent matter that needs to be addressed immediately.

AI and inclusive education

Kelly et al. (2023) believed that it is very contentious and complex to define AI in the academic sphere, and Vincent-Lancrin and van der Vlies (2020) postulated that AI is still nascent. Nonetheless, Wang (2020) defined AI as the science and skills of problem-solving with the use of technologies that incorporate the use of science, technology, engineering, and mathematics (STEM). Yang (2022) also firmly believed that AI is expedient in education because it integrates knowledge of different disciplines and multiple technologies simultaneously. Similarly, Nemorin et al. (2023) believed that AI is a necessary component of education. Further, Kamalov et al. (2023) and Ouyang and Jiao (2021) decisively claimed that AI in education is increasing rapidly. Salas-Pilco and Oshima (2022) conjectured that inclusion is a necessary component of education because it improves educational equity and quality for all students, enhances intelligence, and sustains a more equitable society. Inclusive education is fundamental to developing a more equitable society (Hardy and Woodcock, 2023). It forms an integral part of the education system that seeks to affirm equity, diversity, and equality for all students. Kielblock and Woodcock (2023) surmised that because inclusion addresses the needs of students, proper policy and practice should be implemented to accommodate and affirm this position. UNICEF (2014) defined inclusive education as a sustained and uninterrupted process that upholds diversity and diminishes barriers to teaching and learning. UNESCO (2023) conjectured that inclusion is significant because it values and appreciates every student. Jury et al. (2023) claimed that implementing inclusive education is challenging because educators must continuously address their prejudices and remove barriers. Sadikovna and Azimjon (2023) affirmed that inclusion is highly possible, but it needs the involvement and input of parents, educators, and specialists. Salas-Pilco et al. (2022) asserted that inclusive education

incorporates all students from all spheres of life. De Bruin (2019), Latorre-Cosculluela et al. (2022), Slowík et al. (2021), Cucio and Roldan (2020) also affirmed that as far as possible, all students should study in the same classroom. Engelbrecht (2020) further noted that there is still a common perception that inclusive education is synonymous with special education, and this is not accurate. Because of this conception, there is a gradual movement to comprehend the situations of the marginalized.

Dreamson (2021) opined that although diversity exists in all cultures, it is not negative because it provides opportunities for intercultural dialogue and thus enhances inclusion. Hopcan et al. (2022) and Salas-Pilco (2020) strongly conjecture that diversity and inclusion must form an integral component of the curriculum and incorporate technology among all students, especially those from underrepresented groups. Abidova (2023) also hypothesized this view and further suggested that a genuinely inclusive educational environment frequently stimulates growth and heightens development among students. Chauhan (2017) inferred that AI technologies are very resourceful in society and education, and the advent of these technologies can significantly transform education and have a purposeful intervention in the overall well-being of students. According to Salas-Pilco (2020), the use of these technologies in education supports innovation and improves teaching and learning. Grimus (2020) surmised that these emerging technologies have the potential to support the multisensory aspect of students. This is accomplished by engaging all students, providing suitable environments, and affirming the learning of students (Hite et al., 2020). Further, McMahon et al. (2020) affirmed that authentic environments support collaborative learning and reinforce positive social behavior. Collins (2018) and Shore et al. (2018) concluded that inclusive education is chiefly concerned with providing equal opportunities for all students.

Similarly, Halverson (2018) conjectured that these technologies afford more equitable options in education and allow inclusion. Bransford et al. (2000) also claimed that the significant effects of technology are not automatic occurrences.

They largely depend on how they are inculcated in the teaching and learning process. The effective use of technology relies on various aspects: the openness of students and teachers to adequately accept digital resources, the design of the technology to suit a particular culture, and proper consideration and appreciation for the background and cultural context of all learners (Petko et al., 2018). Furthermore, Xu and Ouyang (2021), Ouyang et al. (2022) affirmed that AI is used in almost all areas of education. Nguyen et al. (2023) opined that the use of AI in education also positively influences the non-teaching aspects: curriculum, timetable, allocation of resources, and the monitoring

of performance of students' apps that affirm learning.

Importance of AI

Many educators are already making full use of AI in teaching and learning, and this also includes the curriculum for students with learning needs (Chen et al., 2020; Hwang et al., 2020). Some of the features of AI represent enhancements to assistive technology: writing tools, spelling and grammar checkers, word prediction, text-to-speech, and speech-to-text.

According to the literature, AI can be employed to raise awareness about issues that pertain to diversity, equity, and inclusion. Chatbots, virtual assistants, and educational platforms powered by AI can also provide pertinent information, valuable resources, and adequate training on unconscious bias, cultural sensitivity, and inclusive practices. Becker et al. (2018) and Seldon and Abidoye (2018) conjectured that by having a wide and varied knowledge of the AI tools that are available, educators can efficiently identify and cater to the various learning needs of students. Educators must keep abreast with these tools and be aware of how they can be applied to ensure inclusivity and accessibility of students.

According to Holmes et al. (2023) and Hwang et al. (2020), AI technology incites human intelligence and invigorates comprehension using computer systems powered by advanced machine learning algorithms, which are guided instructions that describe how to perform various tasks. These steps are used to identify problems and arrive at possible solutions and results. Castañeda and Selwyn (2018) opined that the use of AI in education often causes a paradigm shift where the emphasis is on guiding students through the learning process rather than only focusing on imparting or sharing information. Vincent-Lancrin and van der Vlies (2020) postulated that this shift accelerates learning since students learn how to access information, process it, evaluate it, and apply it effectively.

Students are also empowered and motivated and classes become dynamic, meaningful, and interesting (Nemorin et al. 2023). It is incumbent that educators concentrate on guiding students through the correct and ethical use of AI tools.

Since AI offers personalized learning, it frequently enhances cognition. In addition, it guides educators to use more interactive approaches in teaching, and this can accentuate motivation in the classrooms.

Becker et al. (2018) and Seldon and Abidoye (2018) stated that meaningful feedback is provided quickly so that students can improve their performance. Feedback also allows students to identify areas for development and permits educators to modify the course contents as deemed appropriate. Students can ameliorate their areas of weakness and optimize and improve their standard of knowledge. The application offers individualized lessons, vocabulary drills, and interactive tests to affirm language learners as they advance their proficiency. Hence, educators can improve the outcomes of students by identifying areas of weakness and targeting instruction to specifically address those needs.

According to Holmes et al. (2023) and Hwang et al. (2020), AI can also lead to better student engagement and adaptive learning, which can increase motivation and deepen interest in learning. Moreover, it encourages self-directed learning and can help students to take ownership of their academic journeys. AI promotes and underscores high-quality educational resources, notwithstanding their economic status or geographic location. Because AI facilitates innovative ways of interaction, communication between students and teachers is more effective. They can utilize gestures and sketches to accentuate conversations and make them more worthwhile. Above all, AI can generate responses like that of humans. These novel forms of action frequently provide the necessary support for students with disabilities. Thus, AI can help educators address the various ways in which students acquire knowledge. With AI, educators can anticipate and address how students can successfully learn. AI is quickly transforming teaching and learning and enabling students to adapt to this learning process as it gradually develops (Baidoo-Anu and Owusu Ansah, 2023). This shows students where they can improve their weaknesses and ameliorate their abilities. In this way, AI can accentuate and offer purposeful and worthwhile feedback to students and teachers and also suggest resources to further enhance teaching and learning. Hence, educators can be involved in designing AI-enabled tools to enhance their delivery and better engage and support their students. Using AI in education can be cost-effective. It can also automate several tasks assigned to administration, educators, and IT personnel. It can be instrumental in grading, scheduling, data management, and even tutoring. One of the outstanding advantages of AI is that it facilitates continuous evaluation of students. AI-powered EdTech tools can easily collect, analyze, and prepare reports so that educators can monitor the status of students. This useful information can enable educators to have a more in-depth evaluation in understanding the abilities of students' strengths and weaknesses in the classroom.

METHODOLOGY

Although this non-empirical research collected apposite and germane information using various and current studies, methodical review, and meta-analysis; it also recognizes the great significance of scientific principles. They certainly make an input on AI by way of their scientific theories. A thorough review of the literature was conducted to source accurate and pertinent information about AI technologies and inclusive education from September 2023 to March 2024. This author followed the renowned guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) outlined by Moher et al. (2015). In addition, three leading scholarly databases were searched: Web of Science, Science Direct, and Institute of Electrical and Electronics

Engineers (IEEE) Xplore. Guided by insights from Creswell and Poth (2018), the various searches used words and phrases like AI technologies, inclusive education, diversity, equity, and equality. This was further complemented by carefully identifying certain titles, authors, and year of publication.

RESULTS

Benefits of AI

In the early stages, AI offered limited support for students with disabilities and English learners, but AI must cater to the needs of all students. Educators must prioritize informing to ensure that AI is beneficial in teaching and learning and meets the needs of all students. Educators should be involved in the various stages of designing, developing, testing, improving, adopting, and managing AI-enabled educational technology. This includes examining current AI tools and the use of data and designing new applications of AI based on teacher input (Ouyang et al., 2022). In addition, they need to conduct pilot studies, evaluate tools, and collaborate with developers to optimize the trustworthiness of the system.

Further, they must interact with those involved in education and those who make technology decisions. These include teachers, educational leaders, students, parents, technologists, researchers, and policymakers. Listening to input, and ideas, and engaging in conversations will also assist in integrating AI in teaching and learning. AI can be a valuable tool for educators in supporting, fostering, and enhancing students' learning but it cannot replace human educators. Because AI offers automated routine tasks and quality data analysis, it enables educators to concentrate on other areas such as providing sound guidance, emotional support, and encouragement, and upholding creativity and critical thinking among students (Wang, 2020). According to the literature, AI cannot replace educators because it is unable to fully reproduce human intelligence and creativity. Because it is deficient in consciousness and emotions, it also has a limited ability to comprehend complex human experiences and produce creative tasks. However, it is quite possible that in certain instances, hybrid human-AI work will be acceptable. Human staff will be supported by AI across the core tasks involved in curriculum delivery, student guidance, pastoral support, and assessment.

Limitations of AI

AI models can only learn from data input, and if the data contain biased information, the output can also be prejudiced and devastating. It is incumbent on companies to always ensure that data are diverse and inclusive to address this issue. As AI continues to automate more aspects of education, there seems to be less demand for human educators, which could lead to potential job loss. One of the greatest limitations of AI is that it takes away the human aspect of the learning experience. For example, an AI algorithm is a program that informs the computer how to learn to operate on its own. AI algorithms also provide various instructions for AI technology to think and react to data in ways that are intuitive to how we process information. Because AI algorithms can generate course content and decide how the lessons can be delivered, students may inadvertently miss out on the nuanced approach that only human educators can offer. In addition, AI algorithms can perpetuate bias in the curriculum, which works contrary to inclusion. Another disadvantage is that it is expensive to implement, and not all educational institutions may have a budget for investing in AI tools and technologies. Further, the cost of implementing AI in schools may be overwhelming. As schools become more dependent on AI, there is a risk that educators and students may become too reliant on technology. This dependence could considerably undermine the important traditional teaching methods and the development of critical thinking and problem-solving skills. While AI can foster and personalize the learning experience for each student, it cannot fully appreciate and understand the individual needs and idiosyncrasies of students. When there is too much emphasis on personalization study, it can diminish the need for the emotional, social, and cultural aspects of teaching and learning. In addition, educators could be overly concerned with only collecting data on students and monitoring their personal growth and performance, and this could be a serious concern about the privacy and security of data. There needs to be a balance because the inclusion of AI in education can lead to over-reliance on technology, and this could have negative consequences if the technology fails or if students do not develop basic critical thinking and problem-solving skills due to over-reliance on AI systems. Roberts-Yates and Silvera-Tawil, (2019), Collins and Halverson (2018) and Leshchenko et al. (2020) cautioned that there are some limitations to these technologies. First, they are expensive to purchase and maintain. Second, the constant use of these technologies can cause negative physical harm such as headaches, fatigue caused by virtual reality headsets, and resistance from some educators. In addition, there is a need for pre-training of educators and students who are not versed in technology.

DISCUSSION

Inclusive syllabus: The way forward

Moore et al. (2017) considered that to meet the diverse needs of students and to overcome the inconvenient barriers to accessibility, an inclusive syllabus should be

designed with screen-reader capabilities and a myriad of display formats.

Apart from that, an inclusive syllabus should reiterate the exigence of office hours where greater support and guidance can be provided by educators (Fuentes et al., 2021). This is necessary to create a welcoming school environment in which students can interact, dialogue, ask relevant questions, and gain mentorship from faculty members outside of regular class sessions. Chambers (2020) noted that technology is a strategic element of inclusive education and suggested that the use of assistive technology (AT) can stimulate students with disabilities. McNicholl et al. (2021) defined AT as tools designed to improve the overall well-being of persons. In a study, McNicholl et al. (2021) found that AT bolstered academic performance and participation among students. McNicholl et al. (2021) also noted that students who used ATs mastered academic tasks. This, in turn, allowed them to willingly partake in course material, thereby improving their learning and performance. Assistive technologies such as Calendly can be employed to overcome the time-consuming back-and-forth email challenges of scheduling office hour meetings. Moreover, the convenience of using Calendly expeditiously to initiate a meeting with a faculty member could encourage those students who may be shy or more likely to avoid interacting with a faculty member to take advantage of the mentoring opportunities. In so doing, this will positively contribute to their future professional endeavors. Students can choose to meet with faculty members via videoconferencing, teleconferencing, face-to-face, or any other preferred medium. Whether the office of the teachers is located on the first floor or on the seventh floor, which is only accessible via a staircase, all students are provided with a gamut of options for guidance and mentorship from their professor outside of regular class sessions.

Corbett et al. (2021) stated that over the last decade, there has been a growing trend in fostering inclusive education. This has reshaped the traditional student placement approach whereby separate classes were held for students with special needs or learning disabilities. Gregory (2018) affirmed that over the years, this same traditional placement of students only promoted exclusion, superiority, and harbored the formation of stereotypes. Gregory (2018) also postulated that the inclusion of students with disabilities goes beyond physical involvement in educational settings towards ensuring that teaching methods and assessment practices provide infinite pathways to success. This may be achieved by cultivating a Universal Design for Learning (UDL) approach to accommodate a broader range of learning abilities and preferences. Kelly (2014) recommended the following technologies for encouraging UDL in the inclusive syllabus: Assorted options of representation, Text-to-Speech Software, Talking Calculator, Audio Books, Visual Dictionaries, Mind-

mapping software, Multiple options of action and expression, Speech-to-Text Software, Video Animation, Podcast, Multiple options of engagement, Wikis, Blogs, Shared Google Docs, Calendly and, last but not least, Self-paced Interactive and Quizzes. Mention must be made that the suggestions offered by Kelly (2014) are still continuous and developmental because the use of UDL in the inclusive syllabus may not be available to everyone worldwide. Educators should make a concerted effort to identify appropriate technologies that would facilitate the components of an inclusive classroom. They must remember that inclusive classrooms ought to ensure that all students experience a deep sense of belonging. Hence inclusive classrooms appreciate and support each member of the class.

Another important component of inclusive education is determining the expectations of students and teachers. Educators can develop a Google Doc and spur students to establish the rules and guidelines of the activity with which they wish to comply. Ismailov and Chiu (2022) accepted that it is important to guarantee that diversity is maintained in the delivery of the syllabus and designed to meet the needs of all students. Hooijer et al. (2021) noted that educators ought to be involved in regular and consistent reflection; both being prerequisites to challenging educators to reconsider, rethink, and reevaluate their attitude toward improving an inclusive environment. Educators are within their right to schedule lessons in such a way that they can be accessed asynchronously. They can record the synchronous sessions and provide interactive learning resources for students. All goals and objectives would be clearly outlined, and students would be able to access the learning materials in their own time. Educators can also make learning materials available offline in the form of e-books, digital audiobooks, and digital braille books. This is essential because lack of connectivity and poor internet service could be a serious problem.

Limitations and further research

While this non-empirical study contributed to the understanding of how AI impacts inclusive education, there were some limitations that further research could address. The methods highlighted only personal observations, integrative literature, reflection on current events, and the authority and experience of various authors but it was not grounded on practical observation and first-hand experimentation. Although the arguments presented were not supported by empirical data and may be susceptible to criticism, they do not diminish the quality of this research.

This review only incorporated literature that addressed AI as it directly relates to inclusive education in a general manner. It did not concentrate on minority students and marginalized groups, nor did it include their socio-cultural

background. Additional research could be conducted in greater detail among other minority groups. In addition, this research may have excluded some relevant studies because it was impossible to capture all the information that was available in online databases. Because of limited resources that include a confined database, this study did not represent a comprehensive review of the literature but emphasized in general the impact that AI has on inclusion.

Therefore, further studies could review other emerging technologies and their contribution to education. This non-empirical research did not include fieldwork and the actual voices, experiences, thoughts, and opinions of those involved in the study of inclusion. In this regard, further studies could incorporate both non-empirical and empirical methods. These methods could embrace both the field of science and the research outcome being analyzed.

Conclusion

Although AI technologies unquestionably enhance education, particular considerations must be afforded to inclusivity to further incorporate all students and provide quality education. AI technologies can unquestionably play a more significant role in supporting inclusion. Because technology does not function in isolation and is integrated into society, they both complement each other. This paper presented a general overview of AI technologies and how they impinge on inclusive education. Even though various types of AI and new emerging technologies used for inclusive education were not specifically identified, AI supports and encourages inclusion. Thus, their principal benefits such as improving the overall competencies of students and energizing and motivating their abilities must not be undervalued because AI continues to affirm inclusive education, brings out the best in teaching and learning, and promotes inclusive education.

RECOMMENDATIONS

From the discussion, the following recommendations are offered for educators, stakeholders, non-governmental organizations, and policymakers.

1) Teaching and learning should incorporate AI technologies.
2) Teaching and learning should be child-centered.
3) Educators must promote and encourage AI technologies.
4) Educators must encourage active participation among students.
5) Educators and policymakers should inculcate inclusive education in the curriculum.
6) Policymakers should make classrooms inclusive of

special needs.
7) Continuous professional development on inclusion should be available for educators.
8) Educators should be provided with an overview of inclusive teaching practices.
9) There should be a safe environment apt for learning.
10) Society and policymakers must promote an awareness of inclusion.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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