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The Power of Artificial Intelligence in Education: A World of Possibilities and Potential Concerns under the Lens of Human Capital Theory

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Abstract

With the advent of industrialization and technological advances, the world could no longer be understood within country boundaries. The interconnectivity of ideals, cultures and religion that has emerged through the exchange of trade, commerce, communication and Enlightened ideals gave birth to globalization.[1] The impact of globalization is multidimensional that can be felt over every domain and aspect of life ranging from socio-culture to economy, religion to ideologies etc. Individual lives and society is being reshaped or recreated by this wave of change.[2] In order to comprehend the concept of globalization, scholars have contributed in developing theories and approaches that may enable society towards a global culture.[3] Among myriads of these approaches, 'globalization as competition' garnered much research and debate. The current study is focused on the theoretical approach of Human Capital Theory (HCT); and its global trend 'Artificial Intelligence' (AI). The aim of this paper is to re-conceptualize globalization responsibly by emphasizing on the question whether AI is a hope for a benevolent future or is it a threat to education on global level. After critically analyzing the significance and impact of HCT on education, the next section of this paper will briefly introduce AI within educational context. Furthermore, it will explore the unlimited new possibilities for global education. The third section will relate AI to competitive global theory, drawing implications from HCT within the context of education. Based on the implications of previous two sections, the fourth section will examine the potential dangers of AI-driven-education in the near future. Lastly, we will conclude the study by speculating the multifaceted role of AI, its challenges and implications in education respectively.

Keywords: Human Capital Theory, Globalization as Competition, Artificial Intelligence, education, digitalization

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[1] Anthony Giddens, *Sociology* (Blackwell Publishers, 2006), 30–71.

[2] Robin Shields, *Globalization and International Education* (New York: Bloomsbury Academic, 2013), 12-25; 38-45; 53-58.

[3] Shields, *Globalization and International Education*, 12-25; 38-45; 53-58.

Globalization as Competition: Human Capital Theory

It is noteworthy that both neoliberalism and Human capital theory perceives globalization as competition. Both these theories shared similarity in terms of individualism and market-driven approaches. Human capital theory (HCT) gained popularity during 1960'sthrough the popular works of thinkers like Gary S. Becker and Theodore W. Schultz.[4] It refers to the study of utilizing and allocating resources and capitals (such as human capitals, money, material resources, production and distribution etc.) within economic systems on a global level.[5] The primordial scope of this theory lies within economical institutions across the world, wherein 'competition' and 'individual skills' are served as key factors.[6] Its chief traits are to plan and analyze finances, infrastructures, production processes, distribution and investments within capitalistic or mainstream economics globally.

The goal of this theory is to explore ways to maximize profit, growth and outputs, work-efficiency and wealth accumulation within capitalist system. Furthermore, it explores the role of education, health and training in terms of return on investment. This entails that investing in quality education to attain higher degree will ensure good career, remarkable wages and secured future or vice versa.[7] This also laid the foundation of 'education-skill premium' within labor economics that analyzes the relationship between education, skills and wages.[8] Human Capital Theory evaluates further as to how global economic structures and dynamics can reshape the world through International organizations.

1.1. Impact of Human Capital Theory on Education

Despite immense criticism, the impact of human capital theory on educational policies and discourses is relatively high. Education, in the current era, is seen as an investment for financial security in the future.[9] Students and parents acquire it as means to an end instead of acquiring it for its innate quality and non-monetary value. Although this may have increased the overall literacy rate worldwide, but also resulted into a decrease in the quality of education. In addition, due to lack of government intervention, educational institutes are commercialized and used as a commodity.[10]

Unfortunately, introducing the competitive factor within educational and health facilities led to privatization where the capitalist owners are more concerned with making huge profits rather than providing quality services.[11] To aggravate the situation, globalization as competition has

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[4]Gary Stanley Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education* (University of Chicago Press, 1964).

[5]Donna C Tonini, "Human Capital Theory in Comparative and International Education: Development, Application and Problematics," in Tavis D Jules, Robin Shields, and Mathew A. M. Thomas, eds., *The Bloomsbury Handbook of Theory in Comparative and International Education*. London: Bloomsbury, 2021), 37–49.

[6]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 37- 49.

[7]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 70; Becker, *Human Capital.*

[8]"Case of the Day: The Education Premium in Wages." *Economics Department: Reed College* https://www.reed.edu/economics/parker/201/cases/wages.html [Accessed 24 Apr. 2024].

[9]Theodore W. Schultz, "Reflections on Investment in Man," *Journal of Political Economy* 70 (5, Part 2), (1962): 1–8, https://doi.org/10.1086/258723

[10]"The Rise of Private Education in Pakistan," *Imarat Institute of Policy Studies – IIPS* (2021), https://iips.com.pk/the-rise-of-private-education-in-pakistan/ [Accessed 24 Apr. 2024].

[11]Donald Gillies, "State Education as High-Yield Investment: Human Capital Theory in European Policy Discourse," *Journal of Pedagogy/Pedagogický casopis* 2 (2), (2011): 224–245, https://doi.org/10.2478/v10159-011-0011-3

theorized the world again in terms of dichotomy between affluent and poor class. Various international organizations like OECD (The Organization for Economic Co-operation and Development) and EU (European Union) uses HCT to develop their knowledge-based economy.[12] While, human capital theory may visualize education and on-going learning as a cure to economic problems of a country; it is morbidly applied by capitalist owners or elite class to suit their own interests instead of global progress.[13] Overall, studies have shown that 'globalization as competition' fails to fulfill its own claims and so-called promises.[14] This entails that visualizing globalization in terms of competitive market is based on a misplaced notion that competition will increase work-efficiency, productivity and output.[15] Consequently, this has reduced globalization to economy alone. In addition, this also indicates how powerful regimes play with people's fear of instable future to enhance economic progress. Human Capital theory is often criticized on Marxist stance that it promotes unequal distribution of resources focusing more on profit margins than people and their needs.[16] In addition, it also disregards social and ecological factors and may over-ride human wellbeing for self-centered industrial and profit-making pursuits.

'Globalization as Competition' perceives the concept of globalization merely in terms of economic integration.[17] Broadly speaking, Human Capitalist Theory originates from colonial mindset to marginalize people and perceives individual pursuits of education in terms of investment only.[18] It is worth pondering that competitive theories of globalization indicates that cultural imperialism (particularly Western) is deeply embedded within the concept of 'globalization'. It is one thing to understand globalization as a result of intermingling of cultures, religion, ideas and philosophies; but entirely another thing to develop a certain global approach and trying to impose it universally. Globalization in the first sense is natural; however, in the latter sense it becomes fallible and attracts criticism. In my opinion, no single theory or ideology can become a lens to see the entire world through it.[19] The world is filled with diversity; therefore, a single perspective to mold every sphere of life accordingly will doom to fail on multiple levels. As an educated person, I am not against the ideals of modernity and globalization. But I believe those ideals needs to be conceptualized on equal grounds, or at least on a pluralistic stance, respecting and catering multitude of cultures, traditions, religions and languages.

> This multilevel and crosscutting global religious pluralism refutes the theories of secularization that dominated social science theory and international relations praxis for most of the twentieth century. It also poses new foreign policy challenges, as national leaders seek to combine the pursuit of material interests in wealth and security with attention to questions of cultural difference, religious freedom, and human rights in an era of globalization.[20]

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[12]D. Gillies, "Human Capital Theory in Education," *Encyclopedia of Educational Philosophy and Theory* (2015): 1–5, https://doi.org/10.1007/978-981-287-532-7_254-1.

[13]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 82.

[14]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 70.

[15]Gillies, "State Education as High-Yield Investment."; Theodore W. Schultz, *Education and Productivity* (Washington, D.C., 1972).

[16]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 70.

[17]John J. Clarke, *Oriental Enlightenment: The Encounter between Asian and Western Thought* (New York: Routledge, 1997), 16–28.

[18]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 37–49.

[19]Vanessa Andreotti, *Actionable Postcolonial Theory in Education* (Basingstoke: Palgrave Macmillan, 2011), 16.

[20]Elizabeth H. Prodromou, "U.S. Foreign Policy and Global Religious Pluralism," in T. Banchoff, ed., *Religious Pluralism, Globalization and World Politics* (New York: Oxford University Press, 2008), 297.

Western supremacy (or cultural and economic domination) under the guise of any perspective be it modernism, Enlightenment or the contemporary global trends is simply unacceptable. According to Robin Shield, globalization is a controversial and confusing concept that invites disagreements on variety of issues.[21] Hence, efforts should be made to responsibly re-conceptualize the perspectives of globalization and education that transcends Eurocentric approach.[22]

2. Introducing Artificial Intelligence as the Global Trend

The advent of industrialization paved a way for technological advancements and globalization. The interconnectivity of the world through international communication, trade and ecommerce gave birth to digitalization.[23] It would be safe to say that the digital world is indeed shaping or at least transforming the future of the entire world.[24] These advancements have their perks but also invoke potential global concerns. Among myriads of these technological advances, Artificial Intelligence (AI) is a contemporary global trend that is perceived to be at the highest level of advancement. By integrating mathematics, computer science and cognitive psychology, AI is miraculously transforming the world and the very idea of human existence.[25]

One cannot ignore the fact that AI has revolutionized the concept of global education through enhanced learning outcomes, adaptive learning tools and personalized experience for teachers, students and educational institutions.[26] Indeed, AI has transformed the module of teaching and learning specifically post COVID pandemic.[27]

2.1. AI in Education_ as a World of Possibilities

The term Artificial Intelligence was coined by John McCarthy in 1960's. The technology of AI revolves around the concept of machines replicating human intelligence, i.e., perception, learning, problem-solving skills, cognition and language.[28] There are two ways to understand AI: 1) Symbolic approach analyzes cognition without referring to brain; whereas, 2) Connectionist approach artificial neural network similar to the structure of brain.[29] Although both approaches are pursued, however, connectionists fail to recreate neuron networks of even simple living things.[30]

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[21]Shields, *Globalization and International Education*, 44.

[22]Sharon Stein, Vanessa Andreotti, Cash Ahenakew, Dallas Hunt, "The Complexities and Paradoxes of Decolonization in Education," in Fazal Rizvi, Bob Lingard, and Risto Rinne, eds., *Reimagining Globalization and Education* (New York: Routledge, 2022), 212.

[23]Anthony Giddens, *Sociology*, 30–71.

[24]Shields, *Globalization and International Education*, 44.

[25]B. J. Copeland, "Artificial intelligence - Methods and goals in AI," *Encyclopædia Britannica* 2019, Available at: https://www.britannica.com/technology/artificial-intelligence/Methods-and-goals-in-AI.

[26]Kalervo N Gulson, "Artificial Intelligence and a New Global Policy Problem in Education," in Fazal Rizvi, Bob Lingard, and Risto Rinne, eds., *Reimagining Globalization and Education* (New York: Routledge 2022), 79–91, https://doi.org/10.4324/9781003207528

[27]Michael Kerres, Josef Buchner, "Education after the Pandemic: What We Have (Not) Learned about Learning," *Education Sciences* 12 (5), (2022): 315, https://doi.org/10.3390/educsci12050315

[28]Matt Carter, *Minds and Computers: An Introduction to the Philosophy of Artificial Intelligence* (Edinburgh: Edinburgh University Press, 2007).

[29]B. J. Copeland, "Artificial intelligence - Methods and goals in AI," *Encyclopædia Britannica.*

[30]B. J. Copeland, "Artificial intelligence - Methods and goals in AI," *Encyclopædia Britannica.*

AI has surpassed every sphere of life from promising industrial growth; and reshaping societies in human capitalist terms of efficiency and productivity. As a result, a whole new world of exceptional possibilities has been created by introducing AI in education revolutionizing the traditional paradigms of education.[31] The most common method to integrate Educational policies with AI is to utilize AI-algorithm systems in the work flow of educational institutes.[32]

In the domain of education, AI holds immense promise in several key areas that are discussed below.

AI induced educational systems creates an intelligent tutoring system by integrating machine learning, cognitive modeling and National Language Processing (NLP) to facilitate students and speed-up learning process in an entertaining way.[33] Chabot like Chat GPT (Generative Pre-trained Transformer) is an openAI that have revolutionized learning experience.[34] Learners and educators can use it for effective and time-saving information. Similarly, LISP, Python, Java, C++ are all AI-apps to make listings easily.

Virtual Reality (VR) is a 3D-generated AI simulation that gives the illusion of being immersed in the surroundings.[35] VR is applied in AI-educational apps for immersive learning experiences and enhancing STEM education. Frame VR, agora.io and CyArk are all examples of VR apps. Kahoot, Khan Academy, edX, and Coursera are few of the many AI apps that uses VR simulations to provide free courses enabling e-learning possible worldwide.

AI uses algorithmic data to provide a data driven decision-making pathway for student to learn, devise content and bite-size courses, feedbacks and assessment based on those metrics. This enables student to perform better according to their needs and capabilities to absorb the course. PROLOG is a logical programming language that helps with problem solving and logical reasoning.[36] So, AI credits itself for informed decision making on behalf of the student.

Moreover, every student's need and ability to comprehend and process concepts are different. In a traditional classroom environment, it was rather difficult for an educator to meet the demand for every student individually. After the introduction of AI in education, this issue has been resolve. AI provides personalized learning by using adaptive assessment tools to customize courses according to student's preference and performance. AI combines machine learning algorithms to devise a customized learning plan by generating quizzes, tests and adjustable

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[31]Xieling Chen, Haoran Xie, Di Zou, Gwo-Jen Hwang, "Application and Theory Gaps During the Rise of Artificial Intelligence in Education."

[32]N Gulson, "Artificial Intelligence and a New Global Policy Problem in Education," 79–91.

[33]Felipe Rodrigues Bomfim, Marta Carolina Gimenez Pereira, "Human Capital Theory in the context of Artificial Intelligence," *Academic Star Publishing Company* 12 (03), (2021): 272–277, https://doi.org/10.15341/jbe(2155-7950)/03.12.2021/005

[34]Muhammad Hakiki, Radinal Fadli, Agariadne Dwinggo Samala, Ade Fricticarani, Popi Dayurni, Kurniati Rahmadani, Ayu Dewi Astiti, Arisman Sabir, "Exploring the Impact of using Chat-GPT on Student Learning Outcomes in Technology Learning: The Comprehensive Experiment," *Advances in Mobile Learning Educational Research* 3 (2), (2023): 859–872, https://doi.org/10.25082/AMLER.2023.02.013

[35]Henry E. Lowood, "Virtual Reality: Computer Science." *Encyclopedia Britannica*, 2018, Available at: https://www.britannica.com/technology/virtual-reality

[36]B. J. Copeland, "Artificial intelligence - Methods and goals in AI," *Encyclopædia Britannica*; Mohammed Abdullah Ammer, Zeyad A. T. Ahmed, Saleh Nagi Alsubari, Theyazn H. H. Aldhyani, and Shahab Ahmad Almaaytah, "Application of Artificial Intelligence for Better Investment in Human Capital," *Mathematics* 11, no. 3 (2023): 612. https://doi.org/10.3390/math11030612

difficulty levels so that it can properly assess student's ability and their strengths and weaknesses to grasp knowledge. In addition AI assesses the performance, engagement metrics, and learning outcomes of a learner through educational data analytics. This makes it easier to give timely feedback as well which would takes weeks or more in traditional classroom environment.

In addition, students who are unable to pay humongous fees for courses can avail wide range of free courses from AI devised apps like Khan Academy, Coursera, and Duolingo etc. Hence, AI is cost-efficient, productive and leads to better understanding of concepts. According to OECD, AI serves as a viable solution for 'right to education for all' (EFA) as now every student can acquire knowledge regardless of their region, race, gender or financial status.[37]

AI combined with machine learning algorithms; computer vision, Augmented Reality (AR) and Virtual Reality (VR) have contributed greatly in e-learning.[38] Students are able to learn difficult concepts through gamification. Pupils in remote areas can be educated remotely without any hassle. All the efforts by AI like free courses have enhanced learning outcomes for everyone across the globe. Educators with high command in AI-skills can demand higher salaries in data science, machine learning and other AI related industrial fields.

AI in education credits itself for providing access to its courses at global level. In addition, it provides multiple language options, courses that use diverse range of teaching techniques adopted from all over the world. Hence, AI claims inclusivity by not discriminating students on the basis of language, gender, disability and religion etc.

Before proceeding to challenges of AI in education, let's see how AI intersects with Human Capital Theory in the context of education.

3. AI in Relation to Human Capital Theory within Educational Context

HCT encourages investing in AI within educational context to meet the rapid demands of increased technology and digitalization.[39] Moreover, it provides knowledge-driven opportunities to enhance digital literacy, computer-based and AI related skills for optimized economic progress at global level.[40]

HCT perceives education and training as a means to attain productivity and career development.[41] AI in education will ensure to provide equal access to education and training for everyone at global level regardless of their areas, disability, gender or financial barriers.[42] Thus, AI in education serves HCT purpose to enhance productivity at a global level.[43] On the contrary, despite ensuring the right of education for all,[44] the rapid usage of AI in other sectors is

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[37]N Gulson, "Artificial Intelligence and a New Global Policy Problem in Education," 79.

[38]N Gulson, "Artificial Intelligence and a New Global Policy Problem in Education," 80; Carter, *Minds and Computers,* 132-153.

[39]Bomfim, Pereira, "Human Capital Theory in the context of Artificial Intelligence," 272–277.

[40]Marco Iansiti, and Karim R. Lakhani, *Competing in the Age of AI: Strategy and Leadership when Algorithms and Networks Run the World* (Boston, MA: Harvard Business Review Press, 2022).

[41]Bomfim, Pereira, "Human Capital Theory in the context of Artificial Intelligence," 272–277.

[42]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 37–49.

[43]Chia-Hui Lu, "The Impact of Artificial Intelligence on Economic Growth and Welfare," *Journal of Macroeconomics* 69, (2021): 103342, https://doi.org/10.1016/j.jmacro.2021.103342

[44]Shields, *Globalization and International Education*, 19.

undermining job prospects. Hence, in near future world will be facing job polarizations and job displacements globally.

HCT emphasized greatly on education for increased productivity and innovation.[45] Although AI serves its purpose within educational context, yet it fails to invoke creativity among individuals. We shall see this among potential concerns as to how AI makes student extremely dependent and suppresses critical thinking and creative abilities.

Competition lies at the core of HCT.[46] Accordingly, humans are urged to participate in life-long learning and acquiring skills in parallel to advances in technology.[47] So, AI in education provides innumerable courses and vocational training to polish and upgrade their skills to keep going in the competitive market.[48] While this may be productive for capitalist point of view, the constant pressure of job insecurity and never-ending competition will eventually leads stress, anxiety and depression: factors that undermine performance rather than increasing it.[49]

HCT theorized that the more one is equipped with educational programs and skilled training will have better incentives and career opportunities, and vice versa.[50] It is worth pondering to note that individual's mind and capacity is no match for AI. AI is replacing humans in various sectors for e.g. AI software's for algorithmic data are preferred over accountants; AI-tech humanoids are replacing common labor and domestic chores. Contrary to competitive beliefs of HCT, this will cause job displacements, unemployment and wage disparities. Uncertain future with AI is the biggest challenge while channelizing AI in education. Gulson put forth, in this regard, that "The philosophy of technology can provide us with possible options, that both explore why understanding of uncertainty is crucial to looking at AI and education policy, and why trying to manage AI may be fruitless."[51]

To conclude, AI in educational context correlates with HCT motives. Efforts have been made to introduce multiple intelligence (spatial-visual, musical, logical-mathematical, naturalist, synthetic therapy, intra-personal, interpersonal and verb-linguistics) into policies of education.[52] Nonetheless, it leads to unintended and unforeseeable consequences and risks that may supersede their merits.

4. AI in Education_ Potential Risks

Although the benefits of AI in education are undeniable; however, it leads to several inter-related concerns that need to be addressed before adopting it indefinitely. According to Harvard Business

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[45]Chia-Hui Lu, "The Impact of Artificial Intelligence on Economic Growth and Welfare," 103342.

[46]Donna C Tonini, "Human Capital Theory in Comparative and International Education," 37–49.

[47]Sharon L. Burton, "Grasping the Cyber-world: Artificial Intelligence and Human Capital Meet to Inform Leadership," *International Journal of Economics, Commerce and Management United Kingdom* VII (12), (2019): 707–758, https://ijecm.co.uk/wp-content/uploads/2019/12/71247.pdf

[48]"AI Won't Replace Humans — But Humans with AI Will Replace Humans Without AI," *Harvard Business Review* (August 04, 2023), https://hbr.org/2023/08/ai-wont-replace-humans-but-humans-with-ai-will-replace-humans-without-ai?

[49]Antoine Bruel, "Future of Work: Disrupting Human Capital with AI," *Braincities,* 2019, https://braincities.medium.com/future-of-work-disrupting-human-capital-with-ai-24dc216e9e83 [Accessed 12 Mar. 2024].

[50]Iansiti, and Lakhani, *Competing in the Age of AI.*

[51]N Gulson, "Artificial Intelligence and a New Global Policy Problem in Education," 85.

[52]Xieling Chen, Haoran Xie, Di Zou, Gwo-Jen Hwang, "Application and Theory Gaps During the Rise of Artificial Intelligence in Education," 100002; Bomfim, Pereira, "Human Capital Theory in the context of Artificial Intelligence," 272–277.

Review many AI-researchers opined that "AI is not replacing humans; rather AI is replacing with 'human with AI' verses 'human without AI'"[53] Unfortunately, much of the replacement will be made by automated-AI-driven machines and robots instead of humans.[54] As already discussed in HCT as to how in near future AI will leads to job displacements and inequalities. People who are well-equipped with AI will get higher salary packages than those who are not attuned to AI.

AI determines a road map and content for a student. This standardized approach towards knowledge would ignore individual's interest, curiosity and intrinsic motivation. AI may provide enhanced efficiency in learning but probably at superficial level by ignoring the importance of autonomy and agency.[55] It disregards intrinsic purpose of education that entails the education of mind and developing a character. In addition, learners may become over-reliant on AI that could diminish their decision-making and critical thinking capacities. Moreover, the so-called informed decision-making on behalf of students is too controlling and seems like parental version of saying 'we know what's best for the child.' Various critics are pessimist towards AI that it may be making humans slaves to technology by taking away their autonomy.[56] This area requires rigorous research and empirical data to support the aforementioned claim.

AI-tutoring apps like 'Chat GPT' also gave rise to concerns of plagiarism and unauthorized content. While plagiarized and AI content can be checked with software's like turnitin etc. The practice to check content is only common in Higher education and among research scholars; whereas, primary school teachers rarely test student's content. This could undermine student's creativity.

AI uses algorithm data that contains personal data, login credentials, and behavior patterns and learning progress in order to assess student's ability and to provide feedback. There are certain concerns of violating privacy by misusing sensitive personal information, unauthorized data access and data theft. For instance, fake voice-over app leads to numerous scams worldwide.[57]

Moreover, an educational system with AI will be difficult to adopt by adult learners as they have no prior knowledge, skill and comfort to use AI apps.[58] They would always be marginalized and under-perform as compared to the young learners who are well-accustomed to AI.

Although AI argues for inclusivity in education, critics point out that data produced by AI algorithm could be biased towards certain groups, ideologies, ethnicities, concepts or religions.[59] According to Copeland, "Humans are inherently biased; algorithms are bound to reflect human biases."[60] This sort of biased data can increase inequality among students by reinforcing

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[53]"AI Won't Replace Humans — But Humans with AI Will Replace Humans Without AI."

[54]Antoine Bruel, "Future of Work: Disrupting Human Capital with AI," *Braincities* 2019.

[55]M. Adams, "Empowering Children: the Importance of Autonomy and Agency," *Linkedin*, 2023, https://www.linkedin.com/pulse/empowering-children-importance-autonomy-agency-marcus-dyke/ [Accessed 26 Mar. 2024].

[56]"AI Won't Replace Humans — But Humans with AI Will Replace Humans Without AI," *Harvard Business Review* (August 04, 2023), https://hbr.org/2023/08/ai-wont-replace-humans-but-humans-with-ai-will-replace-humans-without-ai?

[57]L. Cohen, "AI Advances Risk Facilitating Cyber-crime, Top US Officials Say," *Reuters*, 2024, https://www.reuters.com/technology/cybersecurity/ai-advances-risk-facilitating-cyber-crime-top-us-officials-say-2024-01-09/. [Accessed 24 Apr. 2024].

[58]Antoine Bruel, "Future of Work: Disrupting Human Capital with AI," *Braincities,* 2019.

[59]Robert W McGee, "Is Chat Gpt Biased Against Conservatives? An Empirical Study," *SSRN Electronic Journal* (February 2023), https://dx.doi.org/10.2139/ssrn.4359405, https://doi.org/10.2139/ssrn.4359405

[60]B. J. Copeland, "Artificial intelligence - Methods and goals in AI," *Encyclopædia Britannica.*

stereotypes. Consequentially, this would not only treat marginalized students unfairly, but also creates a negative image based on stereotypes and prejudices against them.

Another possible concern for future is that AI is making learners entirely dependent on technology. This in turn is making them vulnerable to loss of human interaction between teacher and student.[61] For holistic educational experience, critical thinking, problem-solving skills, creativity and social-emotional learning are very essential elements. By relying only on AI, all those elements are undermined and ignored. This leads to drastic consequences and potential concerns. However more empirical research is required in the future to explore it further.

One of the major challenges for AI is to eradicate 'Digital Divide' caused by the barriers to technological resources.[62] Any app of AI requires high speed internet connection and devices (like mobiles, tablets or computers). Despite efforts of UNESCO, USAID and DFID, these resources are distributed unequally around the world;[63] and governments need to invest in these sources and infrastructures to regulate these facilities. Until then this digital divide would prove to be a thorn in attaining progressive learning outcomes and reaching the full potential of AI in education.

As mentioned earlier, AI in education leads to privacy risks, breach of data security, and unauthorized content with significant plagiarism issues etc. Moreover, many critics believe that AI may increase cybercrimes in future.[64] Henceforth, AI exposes society to serious ethical concerns (including accountability, transparency and consent) that are swept under the rug in favor of advancing in technology.

5. Future of AI in Education: Conclusive Remarks

AI has both positive and negative impact on education. On one hand, it fulfils goals of globalized education, i.e. a single objectified educational system for all.[65] While, on the other hand, it undermines individual's creativity and logical reasoning skills that are very essential elements for developing an educated mind.

To conclude, we can say based on above discussion that AI opens up door to numerous possibilities that are transforming education at global level; however, research shows that AI also invoke potential risks whose consequences will be far greater than their benefits.[66] There is a persisting existential risk that AI may surpass human intelligence and control giving rise to dangerous and unintended consequences.[67] In similar vein, Gulson asserted that "Such threats include that AI can draw on data and use algorithms that reinforce existing inequities, and that it is differentially applied to already marginalized, racialized, populations."[68] Hence, AI is both the savior and threat.

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[61]Khawlah M. Al-Tkhayneh, Emad M. Alghazo, and Dina Tahat, "The Advantages and Disadvantages of Using Artificial Intelligence in Education," *Journal of Educational and Social Research* 13 (4), (2023): 105–105, https://doi.org/10.36941/jesr-2023-0094

[62]Shields, *Globalization and International Education*, 53-58.

[63]Shields, *Globalization and International Education*, 54.

[64]L. Cohen, "AI Advances Risk Facilitating Cyber-crime, Top US Officials Say."

[65]Shields, *Globalization and International Education*.

[66]Al-Tkhayneh, Alghazo, and Tahat, "The Advantages and Disadvantages of Using Artificial Intelligence in Education," 105.

[67]B. J. Copeland, "Artificial intelligence - Methods and goals in AI," *Encyclopædia Britannica.*

[68]N Gulson, "Artificial Intelligence and a New Global Policy Problem in Education," 88.

Therefore, educationists need to tread very carefully while implementing AI in educational policies. Moreover, it would be best if AI is used moderately in education in order to neutralize some of the risks involved. Also, if AI is combined with others methods of teaching and learning then the importance of student-teacher interaction may not be ignored. Only by maintaining traditional classroom environment combined with AI technology can ensure that the concerns of AI in education wont outbalances it futuristic potentials.

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