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The Transformation of Education in AI Era

Outline

1) Introduction

Artificial intelligence has an enormous tendency to bring about a revolutionary transformation in education sector. At the same time the problems artificial intelligence may bring with it cannot be ignored. The most plausible, solution in this scenario, is devising such an approach towards the employment of artificial intelligence in education sector; which maximizes the benefits, while reducing the harmful effect.

2) An overview of artificial intelligence, and the transformation of education sector.

3) AI's contribution in the transformation towards better education.

   i) Role of artificial intelligence in combating school drop-outs.

   ii) AI's contribution in automation of administrative tasks in schools.

   iii) AI's role in reducing the disconnect between industry and academia.

   iv) Provision of personal support to teachers by artificial intelligence.

a) AI providing up to date data and information to teachers.

b) Skill enhancement and training using feed-back from artificial intelligence.

c) AI providing better learning experience for students by personalization.

4) Artificial intelligence, transformation of education, and the emerging challenges

i) Expensive hardware and subscription fee to use AI in education sector.

ii) Authenticity of knowledge, information as data provided by AI is questionable.

iii) Advent of artificial intelligence has resulted in increased plagiarism.

iv) Artificial intelligence has challenged a teacher's role in education.

v) AI's lack of sentiments and emotions resulting in neglect of emotional development of students.

5) Way-forward for the optimal use of artificial intelligence in transformation of education

i) Spreading awareness about basics of AI among teachers and students.

ii) Seeking cooperation from the global community.

iii) Enacting laws for the optimal use of AI in education system.

iv) Public-private partnership to use AI in order to increase enrollment.

6) Conclusion.

Essay

The Transformation of education has always been a hot topic. The debate regarding reforms and transformation in education sector, is going on for a very long time. The factors which make people discuss education reforms can be various. However, two of them are of greater importance. in this regard shortcomings of existing education system and emergence of few new knowledge or technologies. To foster and spread any technology, education serves as the most appropriate medium; at the same time that technology can be very hanful in improving education standards. When one looks back in the past, one such example that comes in one's mind is of information technology. Education has played most crucial role in the success of information technology, and information technolog has paid back by bringing innovation in education; distant learning, online learning are few of the examples. These days, another such technology has emerged, and it is titled as artificial intelligence. Education sector, again, has played its role in development of this science. Now, is the time, to explore the impacts of integration of artificial intelligence

in education sector. AI can bring about many reforms in education; thus, improving overall standard of education; at the same time, it brings many challenges with it, but one cannot ignore the fact that artificial intelligence has an enormous tedency to bring about a revolutionary transformation in education sector. At the same time, the problems that artificial intelligence may bring with it, cannot be ignored. The most plausible solution, in this scenario, is devising such an approach towards the employment of artificial intelligence in education sector, which maximizes the benefits, while controlling the harmful effects.

In order to develop a suitable approach, for an effective use of artificial intelligence in education sector, one must be aware of the term "artificial intelligence." The history of artificial intelligence dates back to 1950s. So, experts have been working on this technology for many decades. The Oxford Dictionary has defined AI as, "The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision making, and transformation (translation) between languages." These days artificial intelligence

is being used in different walks of like such as, automated systems; self driven cars; auto-correction in search engines; etc.. The advent of generative artificial intelligence – having ability to learn and adopt – has further expedited the transformation, being brought about by the era of AI. The education sector, at all levels is exposed to the changes that artificial intelligence has brought. On one hand this AI-driven transformations has many opportunities and benefits on offer, on the other hand this transformation has potential to undermine the values, which an education system is supposed to impart in student. The main point of focus, here, is to find such a balancing approach through which optimal transformation in education is achieved.

As, it is an established fact, that artificial intelligence has the potential to transform education; consideration of positive outcomes that AI can achieve is noteworthy. AI can help in improving education in many ways. One such situation that, instantly, comes in one's mind is to combat the school dropout issue. A survey, conducted by United Nations Education, Science and culture Organization (UNESCO) has shown that as of now 244 million youth and children are out of school globally. To address

this issue, the school dropout issue needs to be addressed first. AI, to some extent, has managed to find a solution to this problem. The government in Argentina has employ an artificial-intelligence based algorithm, which basically detects the students who are likely to drop-out from school. This algorithm – using four variables – forecasts to chances of a student to drop-out. The professionals in Argentina have managed to solve the issues of those student, who were thinking of leaving educations, by their accurate, and timely detection. So; artificial intelligence is a vital tool to tackle this issue.

Moreover, many teachers have to divide their working hours in different slots, some of them reserved for student interaction, while others to be dedicated to administrative task. A survey conducted by mckinsey and company suggests that, "Teachers work about 50 hours a week, spending less than half of the time in direct interaction with the students." This results in adverse effects on learning. AI can play its part in enhancing the interaction time of teachers with students. Owing

to its abilities like data analysis, sorting, learning and decision making, it can take charge of administrative tasks such as, maintainance of attendance; routine based report writing; checking mcq based assignments; assigning homework. Thus, using artificial intelligence, teachers can focus on their interaction with children, while leaving administrative tasks, to be performed by artificial intelligence.

Another issue that education system is faced with, is the disconnect between industry and academia. Pakistan's education system, especially, for is finding it very hard to find a solution of this problem. Incorporation of AI, in academia has offered different mechanisms to ameliorate the problem. Different artificial intelligence based tools can be used to analyze market trends, job descriptions and skills in demand. Based on this analysis, AI can further constitute a curriculum that focuses on development of those skills, which are demanded by industry. By doing so, the graduates, passing out, will be trained according to the standards which are set by industry. As a result, the disconnect between industry and academia will cease to exist with the passage of time.

Another problem is absence of a support mechanism which helps teacher in adapting according to rapid scientific advancements. As it is not possible to hold physical training session very often, owing to financial and time constraints, an artificial intelligence based support system can help out teachers in this regard. One such help is to keep teachers informed about the latest developments and researches. This will help teachers, to include in their lessons upto date knowledge and facts. This activity is very beneficial as books are not able to incorporate latest developments as they are mostly published one or twice a year. Similarly, this mechanism keeps teacher aware of new trends in education, new teaching methods; new researches on students' behaviour. So, artificial intelligence has ability to keep teachers abreast with of latest educational developments.

Another factor that helps teachers in improving their teaching methodologies is feed back mechanism. As, experts are already in fewer numbers, and students

are very reluctant to give a feedback on the method used by a teacher. Teachers are unable to improve upon their shortcoming due to lack of feedback. AI, fortunately, has also managed to cater this issue. AI can give suggestion on curriculum development, test pattern and mode of assessment. The more interesting way to evaluate a teacher is, when an artificial intelligence bot act as a student and completely emmitates students. After, recording lecture or lesson, it raises questions and also pinpoints the engagement of content teacher in class. So, using this methods teachers can re-identify the problems in their lesson delivery and teaching methodolog, and correct these problems. So, artificial intelligence, with its feedback, helps teachers to improve and work on their shortcomings.

Moreover, the fruits and benefits of artificial are not only limited to teachers and professionals, but are equally helpful to students. As all the students in a class do not have same intelligence quotient, neither they have same aptitude, nor they come from same educational

background. It is impossible to achieve similar level understanding within the class room. Artificial intelligence, however, is equipped with the tools which focus on personalized education. AI based chatbot are able assess a student's & student's behaviour, his thinking pattern and interest. Based on these observations, these bots recommend such techniques and contents which are exclusively designed for optimal learning of students. Keeping this in mind, Khan Academy, a non profit business organization has employed "khanmigo", an AI based virtual teacher. According to Sal khan, founder of khan academy, introduction of virtual teachers has resulted in more interactive classes. Hence, artificial intelligence can provide better learning experience for students.

Although artificial intelligence can transform the existing education system in to a more optimum and superior education system, one cannot ignore the challenges that are serving as hurdles in the way of such transformation. One such challenge is the cost related issue. The artificial intelligence.

tools in education sector are working on subscription based model. Which means that, one has to pay a certain amount of money to use these tools. So, to incorporate such tools in education will require hefty amount of money. Additionally, it will also require installation of hardware and equipments in schools and universities, which too is very expensive. So, in order to integrate artificial intelligence with education system huge sum of money is required, which is a scarce entity in developing countries. Thus, the expensive nature of artificial intelligence makes it unaccessable for many countries.

      Another problem that arises, even if one manages to procure AI based infrastructure, is authenticity of knowledge and data provided by artificial intell-gence based chat-bots. For instance, the famous chat-GPT answers the question on the basis of data base which was last updated in 2021. Many new developments have taken place in last two years, so but chat GPT does not use those new developments. Similarly, even if the data base of

such chatbot is updated, it is nearly impossible to verify the authenticity of data that is available in such huge volumes. So teachers, researchers and students must be careful while citing any information from artificial intelligence based resources. These resources not accurate enough to be used in research as of now.

Additionally, advent of the era AI, to some extent, tantamounts to advent of the era of rampant plagiarism. Plagiarism is presenting someone else's work as one's own creation or effort. As, Bard and chat-Gpt can solve variety of academi academic assignments, papers and texts from literature to mathematics, they are also being used in plagiarism and cheating. It has been observed, that student are blatantly using artificial intelligence to write project report; to write assignments; to develop programming language code; to solve complex numerical problems. This has resulted in overall de-gr-adation of education system. Teacher are finding it very hard to assess

that neither the assignment submitted by the students is solved by them or any artificial intelligence based the resource or tool, so, artificial intelligence has facilitated cheating and plagiarism.

Furthermore, excessive use of artificial intelligence in education sector can cause teachers to feel insecure. Man Ed-tech related companies are working on virtual teachers which may replace the humans in classrooms. Although many AI experts of are of the opinion that the job of AI is to help aid teachers and not to replace teachers. Despite, all these assurances, no one has challenged the potential of an artificial intelligence to override authority of the teachers. Since, Ed-Tech expect artificial intelligence to design curriculum; to decide the time frame required for course completion; dictate the methodology to be used in teaching; all these action, if performed by artificial intelligence will result in, teacher becoming a mere follower of commands, being issued by artificial intelligence. So, artificial intelligence has the potential to threaten and challenge a teacher's place in an education system.

Another factor that is totally ignored, while considering incorporation of artificial intelligence in education is humans as emotional beings. Education develops emotional traits in humans along with mental development. Traits like sympathy, empathy and magnanimity. Most of the times, the responsibility of fostering these traits in students rests with the teachers. Teachers are able to inculcate morality in their students by interactions which may or may not be the part of curriculum. So it can be said, that the teachers play very important role in imparting both knowledge and morality to their students. When artificial intelligence is used to design curriculum, guide teachers about teaching, tutoring student; the efficiency in transferring knowledge, and polishing of critical thinking is achieved, but at the cost of morality getting ignored. Hence, leading to complete ignorance of emotional developments of students.

As one can observe, that using artificial intelligence provides humans with many benefits along with some challanges. So, inorder to incorporate artificial intelligence in education, optimal strategy

and policy making is required. The first step should be to equip both teachers and students with the basic knowledge about the usage of artificial intelligence. In this regard a public-private partnership can be very beneficial. The focus should be conducting workshops, seminars and interactive sessions on artificial intelligence. Teams of experts should visit educational institutes and spread awareness among the teachers and students about the basic use of artificial intelligence. So, spreading awareness among the teachers and students must be the first goal

Furthermore, cooperation with global community can be helpful in inculcating artificial intelligence in education. Pakistan can seek help in from countries which have already made some progress in this domain. Additionally, Pakistan can become a part of global conventions related to artificial intelligence in education. United Nations Educational, Scientific and Cultural organization (UNESCO) has already taken up this agenda; it is working on smooth and safe integration of artificial intelligence in to educational transformation. UNESCO is not only,

spending resources on theoretical studies of this issue but also striving towards collective well-fare through artificial intelligence in education. Seeking cooperation from UNESCO and developed countries will be very beneficial for Pakistan, as these entities also provide financial support along with technical support. Thus, cooperation with international community will help Pakistan in adopting artificial education to transform its education system.

Moreover, it is imperative it is necessary to define extent and scope upto which artificial intelligence is to be used in education sector. In order to achieve this goal legislation is the way to go. Government and law makers are required to come up with an act of parliament which grants permission of using artificial intelligence in education. The law should also address issues like plagiarism, extent of using AI, checks and balances in application of artificial intelligence in the education sector. In order to make legislation more effective the opinions of technology experts,

education experts and, representatives of public must be kept in consideration. So, it is very important to frame such laws which can regulate role of artificial intelligence in education sector.

les Additionally, the large number of out of school students is a matter of great concern for Pakistan. The high costs of artificial intelligence base infrastructure, is acting as a hurdle in the way of using artificial intelligence to improve enrollment. However, public private partnership can resolve this issue. The Governments and big private companies can make co-ordinated and collaborated efforts to provide schools with the basic infrastructure and training required to adopt artificial intelligence to improve school enrollment. Thus, public-privat partnership can work wonders in this regard.

As the era of artificial intelligence, has potential to transform the world, that we live in. It is impossible to ignore the type of transformation, it has brought. Transformation of positive type, is the need of the hour in case of

the existing system of education. Pakistan's education system, in particular, has been requiring a major overhaul for quiet some time; however, financial and technical limitations have hindered Pakistan from performing such overhaul.

Artificial intelligence has emerged as a source of providing such overhaul. Although it has its limitation; it is too expensive to adopt; it brings with it the issue of plagiarism; it lacks authenticity; the teacher's role gets compromised, and it does lack human empathy. Inspite of all these issues one cannot ignore the advantages it may provide, when it comes to transformation of education. It can help in combating school dropout, automation of administrative tasks, curriculum designing and skill development, improving teaching methodologies, and making the process of learning easier. Now is the time to take some key steps—such as legislation to incorporate AI in education system, public and private partnership to procure infrastructure and training— which can transform education system and pave the way towards a prosperous Pakistan.