Exploring Artificial Intelligence in Higher Education: A Multifaceted Revolution

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Abstract

The artificial intelligence assures a wide spread enhancement with astonishing expansion in the field of education. Artificial Intelligence is defined as the ability of a machine to imitate the effort which otherwise needs human interference.AI has influenced almost every aspect of education starting from creating content as per the needs of students to make personalization possible, to instant feedback to act instantly on the problematic area and makes them more open to learning. The present epoch of technology emphasizes in designing high-tech environment ingrained with the digital competence for the development of proficient teachers and skilled students. Impact of AI can be seen in almost every sphere of life starting from business sector to healthcare, besides it has fixed its roots in the education sector as well. Automated system on the one hand is contributing a lot in enhancing human capabilities but is always associated with potential threat to replace human completely. So it would be safe to say that by creating a balance between the hard and soft skills the state of uncertainty can be avoided. This chapter seeks to provide an overview and analyses the impact of artificial intelligence on higher education. This chapter aims to investigate the applications, benefits, and possible challenges in introducing AI in education. This chapter will also analyse the impact of AI in academic research and associated ethical issues. Finally, this chapter reflects on future directions for AI in higher education.

Keywords: Artificial Intelligence, Automation, Digitization, Higher education, Personalized learning.

INTRODUCTION

Abrupt rise in the digitalization over the last couple of years has remarkably affected the process of teaching and learning in a positive manner(Tijani et al., 2020).Considerable use of AI tools has been seen right from primary education and initiatives are being taken to make it central in the higher education for the amazing results in the near future. AI automated pedagogies revolutionized the way students learn and teachers teach in and outside the classroom and continues to gain importance worldwide (Chen et al., 2008).AI generated tools capable of transforming the system of education should embrace the changes made through human interaction in the classroom situation.(Mitchell, 2017).

Artificial intelligence (AI) is defined as the ability of machines to accomplish the tasks that generally require human power. AI has become a buzz word due to its dynamic nature and has influenced almost every sphere of life right from commerce sector to healthcare, besides it has fixed its roots in the teaching-learning as a whole. In context to Higher Education massive contribution of AI accelerated the process by providing customized content, pace maintaining strategies, automation of administrative tasks and personalized assessment and evaluation. Furthermore AI in higher education exhibits precision in results, unprecedented retention and huge accomplishments in less time (Bhatnagar et al., 2021). Teacher in the field of higher education has been influenced by the potential pedagogical opportunities of AI where his role has been shifted from a conventional instructor to a facilitator. However, Unawareness among some teachers regarding its extensive scope becomes an obstacle in realizing highest possible achievements (Hinojo-Lucena et al., 2019). To ensure consistency of quality teaching, proficient and flexible teachers will be an asset in the field of education. Higher education is profoundly dependent on human effort which widens the scope of self-sufficiency of both instructor and learner in achieving significant knowledge in the realm of education(Aznar, 2022).

Artificial intelligence in higher education exhibits a comprehensive scope in the field of research with an emphasis on acquaintance of upgraded skills on the part of researcher. AI-generated tools helps as an effective research assistant. While subsiding the risk of human error huge amounts of data can now be collected and processed in a short span of time. In addition, customized services are being provided in writing academic papers and chapters which significantly saves time and enhances the quality of research journey.

Many ethical considerations and risks came along the rapid development of AI applications in the field of education.AI as a powerful tool warrants a potential endeavour to address certain challenges yet it poses a threat which may have long-term deleterious effects on the society as a whole. Firstly, it may target human interaction which plays a vital role in building rapport between the teacher and student. Face to face interaction creates a practical setting which helps in developing social and emotional skills among students. Secondly, manipulation of data sets which may include personal information raises the concern about the security and privacy of students. Among different ethical issues the concern about privacy and security has been perceived more serious in terms of its negative impact on ones wellbeing. Lastly, excessive use of AI may diminish the role of human teacher, the vital pillar of education system to a great extent.

It will be thrilling to see further expansion of AI in the near future but that will definitely be associated with the chaos and confusion, may leave the system of education with no choice but to adopt AI either fully which may have serious consequences or it is to be excluded from the scenario to make complete human dominance possible. However, both the situations may exhibit some lacunae in the teaching- learning experience. To make this process smooth and captivating balance between the hard and soft skills ought to be ensured.

APPLICATIONS OF AI

Artificial Intelligence can make large contribution in improving various facets of our education system. Certain Promising applications of AI in academic functions and practices are elucidated as follows.

Standard Upgradation of Instruction: AI is a powerful tool which enhances the quality of teaching by providing the personalized teaching experiences. Quality teaching relies on proficient teachers which can be achieved via machine learning tools.AI helps in creating quality content and tempting methods keeping in view diverse needs of students. By analysing different data sets weak areas of students can be recognized and worked upon for further development. Besides AI powered tools applied in the assessment and feedback enables teacher to improve their practices which acts as are medial measure to the student. Moreover content created through AI can be made more appealing by making illustrations all through. Hence, teachers can reallocate their time in developing some creative engagements and can focus on those areas which needs further improvement.

Personalized Learning: Artificial intelligence takes into account the abilities and interests of every student to make personalized learning possible.AI helps in creating the content and pace maintaining strategies which furnishes the learning capabilities of a student. Moreover instant personalized feedback given to students helps them act instantly on the problem areas for subsequent development.

Remote Learning: AI is a significant tool that worked nothing less than a miracle in making education possible to those students who cannot be present physically in the institution but have the accessibility to this system. Rural and disadvantaged section of society fall into the category of people who can get tremendously benefited by remote learning. MOOCS (e-content) as an instructional material is being provided online which covers almost every sphere of education. Moreover remote learning has the same scope as institutionalized one where data is analysed to make personalized learning possible.

Upgradation in Curriculum: Course of study is the map for the students to reach to the set goals. AI enabled system works upon different components of curriculum and suggests suitable content and strategies as per the needs and interests of students. AI not only helps in creating interesting curriculum but can also upgrade it frequently for continued development.

Recognizing Student's Problem: AI is playing a leading role in understanding the problems of students and making timely provisions for those problems. Students may experience different problems in different areas. They may have problems in understanding the content or strategy adopted by the teacher may not be suitable to every student. To ensure solutions to those problems data is analysed with the help of which weak areas of students can be identified. Hence teachers can utilize their time in those activities that support student learning.

Dropout and Retention: Dropout is one of the most complex phenomena which impacts the system of education negatively. There can be different reasons for the dropout of students but the most prominent problem lies with the competency of teachers and quality of teaching. Automated AI system can capture the real problems by analysing the results and assessing students' performance which once rectified can help in student's retention.

Timely Feedback: Teaching and learning is an ongoing and ever evolving process which helps an individual to grow in a systematic manner. Artificial intelligence multiplied the same process with indefinite progressive approaches and instant feedback is one among them.

Timely feedback makes it possible for the students to act instantly on the problematic area and makes them more open to learning.

Research work: AI-powered tools can help as an effective research assistant in the academic field. Its applicability in research became more prominent over the last few years. AI can aid the researcher right from finding an area of interest, to find research gap, collecting relevant data, analysis and interpretation to writing research papers. Chabot is an AI tool which is being used frequently by the researchers to complete their research work even before the stipulated time.

Support to Specially Abled learners: AI works wonderfully for specially abled as it does for the normal classroom students. Specially abled students often needs an extra care and attention to learn effectively.AI system recognizes different needs of such students and provide them with the suitable learning material and conducive environment. Besides, comprehensive assessment is being used for identifying learning patterns. AI has come up with different assistive technologies which are being used for students with impairments. Moreover AI can create inclusive learning condition where every student will be ensured to have equal opportunities to learn under the same roof.

Mechanization of Managerial tasks: In traditional setting teachers spend most of the time in managing administrative tasks which terribly affects the teaching learning process. With the advent of AI this burden no more lies with teachers. Manual enrolment of students where students are filtered as per the set criteria, grades provided to students, maintaining attendance and securing other student related documents can now be handled by the automated AI without much effort.

CHALLENGES OF AI

This section presents the main challenges regarding the incorporation of AI in education as a way to improve and promote the quality of learning. Despite abundance of benefits Ai has in the field of education, yet there are different challenges which if not handled appropriately can have detrimental effects in the long run.

Protecting Equity and Inclusion: Equity and Inclusion are the core concepts where it is ensured that everybody will get the same opportunity to achieve same education under same settings. Among different sections of society marginalized section is still lagging behind in the field of education. At the time of policy designing for AI in education, this section of

society who don't have ample opportunities to receive education through AI has to be taken into cognizance. This strata already living in inequalities if excluded from the area of AI would further hamper their capabilities to compete in the future. To make AI education possible some fundamental provisions include internet access to one and all and international associations working together to develop set-up for the marginalized sections of the world (Mutoni, 2017).The educational void between the upper class and the marginalized section of society can be filled by offering digital education to all which is still a challenge.

Professional Growth and Support: Be it traditional classroom situation or AI enabled classes nothing can replace a teacher in personalized learning environments. In traditional settings teachers had their unique way of teaching but the century's long trend has now been changed to AI where we need to switch to training and ongoing support to effectively implement this approach to manage diverse student needs. For the extensive use of AI – enabled technologies in the classroom, the skill development training and support of teachers is a dire need. (Luckin & Holmes, 2016).

Upgraded Content and Course of study: One of the most significant uses of AI in education is curriculum development. AI can offer different methods and flexible content for the Upgradation of curriculum as per the unique needs of students. However, extended use of AI in curriculum development can replace teachers sooner or later. Moreover, developing such flexible curriculum which will suit all is tedious and challenging.

Ethical Concern and Safety: AI-enabled system requires student's personal information which is analysed to make Personalized learning possible. The data once collected should be analysed properly misuse of which can have deleterious effects on ones wellbeing. To safeguard personal data prior consent from the students should be taken to interpret the data in an educational setting. Manipulation of any kind becomes an ethical issue which is thought-provoking.

Technical Constraints: Technical issues like interruptions in connectivity, inaccurate interpretation of information, system errors, faults in software and lack in high-performance digital assetsmay pose challenges in utilizing the benefits of AI completely.

Research Activities: AI plays a vital role in the field of research. Its applicability in research became more notable over the last couple of years. AI can aid the researcher right from literature review to find research gap, collecting related data, analysis and interpretation to

writing research papers, in spite of all these benefits, it still experience certain challenges. To preserve the identity of a researcher it is mandatory to take AI only as a support system. Moreover AI as a system works on the given data which if incorrect will be processed inadequately leads to unfair results. Besides, substantial use of AI can impede critical skills of a researcher as well.

Assessment and Evaluation: Deeper understanding of progress and capabilities of a student can be attained through the process of assessment and evaluation. Different assessment tools have been used from time to time which only focussed on term end outcome on the basis of which students were being classified to different categories. However, so far as personalized assessment is concerned standardized assessment (formative and summative), paves the way to understand students in almost every aspect yet its application in the educational setting can rather be challenging.

Higher order dexterity: Reasoning, creativity, problem solving and critical thinking are some of the skills which cannot be assessed effectively by AI tools. Incomplete evaluation of such skills can impact the overall learning process.

Dearth of human communication: AI tools have tremendous applicability over humans but human involvement is irreplaceable. The interaction between the teacher and student has been there since education came into existence. Face to face interaction develops a realistic environment and sense of belongingness which is not possible through the use of AI. Excessive reliance on AI tools may impact the two-way interaction which in turn impacts.

ARTIFICIAL INTELLIGENCE IN RESEARCH

AI is a powerful tool which influenced the field of research incredibly. It helps the researcher by providing efficient assistance in their studies. Artificial intelligence has an applicability right from providing help in identifying research gap which assists a researcher in selecting a delineated research problem. Data collection is being considered hefty and stretched period where researcher needs a lot of time and patience as well, but AI has changed the way it has been done before. While subsiding the risk of human error huge amounts of data can now be collected and processed with the help of Chabot's. Moreover availability of these automated tools can make it easy for a researcher to collect accurate data regardless of time and location.

Research is a comprehensive process where human research assistants are being hired to complete the process in a stipulated time, but the way AI is emerging can take over these

human assistants and may facilitate the process far better than human's do. It offers personalized services in writing academic papers and articles. Moreover, enhancement in group effort among researchers can be seen where they can get benefitted by disseminating related and relevant information.

AI enables the researcher to work with large amounts of data more efficiently than humans can which intern accelerates the process of analysis and interpretation of the same. Besides repetitiveness can also be prevented by using AI efficiently.

AI generative tools have a wide range of applicability not only in content creation but it works equally for detecting the plagiarism in AI created content. Copy leaks, GPT Zero, Winston are some of the AI powered tools which are being used in detecting plagiarism. Eventually, AI can have striking results in the field of research but its use should be confined to certain limits only. AI should be used as an aid and should not replace the human researcher. Both automated system and human researcher have certain limitations on their part, collaboration of both can bring astonishing results in the field of research.

LIMITATIONS OF ARTIFICIAL INTELLIGENCE

Automated systems if trained on inaccurate data can result in erroneous outcomes which can be detrimental to certain sections of society besides the validity of results can also be compromised. Higher order skills like creativity and critical thinking cannot be assessed efficiently by AI tools, incomplete evaluation of such skills can lead to misinterpreted results. Data security cannot be promised while using AI as a data collection tool. Personal data of participants can be manipulated which have deleterious effects on one's mental health. AI can create potential content and can help in writing research papers and articles as well which can hamper the capabilities of a researcher to think critically.

AI cannot work on affective domain which includes emotions and empathy. Some research areas needs understanding of emotions as a research problem these problems can be taken by humans only, hence it limits the scope of AI in the field of research. Excessive use of AI in the field of research can deteriorate the potential of human researchers in developing body of knowledge. Automated systems should always be taken as a complimentary aid but not a substitute to human researchers.

AI can be trained in the areas of public opinion surveys to manipulate certain information in the form of public opinion leading to erroneous results. These are mainly used to gain

popularity in the political scenario where certain viewpoints are strengthened over others; dissemination of such fabricated information can be devastating.

Good Research needs a good amount of time and perseverance. Researcher should never make haste in completing the given assignments rather critical and creative aspects which are the basic skills should be put into use. The present era of technology emphasizes in creating technological environment embedded with the digital skills which makes ample opportunities for researchers to use these technologies for completing their research in a stipulated period of time. To prevent vagueness and susceptibility frequent workshops and group discussions should be organized in universities to give students and researchers knowhow of mechanism and power of automated systems. Hence, responsible and ethical use of Artificial intelligence can have incredible results in the field of education.

THE FUTURE POSITION OF AI

"AI will be the best or worst thing ever for humanity, so let's get it right."— Elon Musk

We have already discussed in the previous section about the potential benefits of AI in the field of education. These benefits will always be seen even with more precision in the near future. We can't deny the utilization of AI tools as it has become an integral part in the human lives. But the question is when to Implement AI.

Educational Institutions should embrace AI technology keeping in view the scope of AI application's and its effect on already existing scenario. To ensure better implementation of these tools incorporation of AI literacy into curricula will equip the students with the knowledge and skills required to recognize the implications and accountabilities associated with automated tools. Implementation of AI in higher education cannot be limited to the benefits only, but certain severe repercussions may also be associated with it.

Firstly, the automation of jobs will have substantial bearing on workforce where educational robots and other AI technologies will take over the teachers by making the instructions more efficient. It has become an irrational conviction that AI will replace teachers in the near future but the fact is that irreplaceable capabilities of a human teacher extend far beyond the scope of AI. AI generated tools are devoid of higher order skills like creativity, critical thinking and problem solving essential for all round development of students exhibits the enduring importance of teachers in the process of teaching and learning. To safeguard the position and value of human teacher educational policies should be put into place for

reconsidering teacher's role and pedagogical models in realm of education. Furthermore universities have wide scope in organizing the refresher courses to enhance the digitalization on the part of teachers.

Secondly, AI condenses the development of social skills in students by minimizing the interaction in the classroom setting which can negatively affect the teaching –learning process. Finally AI poses potential menace regarding privacy and security of datasets, illegitimate manipulation and dissemination of data including personal identification details and AI hacking can have detrimental effect on one's well-being.

The role of artificial intelligence in higher education should not be confined to diminish it to a set of procedures for enhancing teaching and learning rather it should have a bearing in enhancing higher order skills of human teachers and students to decode digital technologies and to boost the educational process as a whole. Consequently, in addition to demand for exclusive set of proactive solutions to the potential threats educational institutes need to stay extra cautious to avoid the unjustified control of AI in the future of education.

CONCLUSION

Artificial Intelligence is not the only solution, but it paves the way for the implementation of innovative standards in the process of teaching and learning (Provost et al., 2018).Emergence of Artificial intelligence has shifted the entire system of education from conventional classroom setting to AI powered flexible system.AI has worked magnificently so far in upgrading the quality of teaching and in bringing flexibility in academics(Michel-Villarreal et al., 2023)**.** Artificial intelligence takes into account the abilities and interests of every student to make personalized learning possible. It can contribute in creating the content and pace maintaining approaches which furnishes the learning capabilities of a student. Moreover instant personalized feedback given to students helps them act instantly on the problem areas for further development. Endless contribution of AI needs to get tracked to certain important things which includes educational set-up, proficient teachers, and trained students. Introduction of AI powered education can fill the breach in the process of teaching and learning. These upgraded practices will not only boost the quality but also serve as long-term developmental aid.

AI loaded with benefits has also a chain of evident consequences which may include ethical issues like the privacy and security of data sets, and the replacement of human teachers. Certain robust initiatives ought to be taken to make the process smooth. Training courses for

teachers should be organised to make them skilful enough for using AI applications in a suitable manner. Extensive research needs to be done on the emerging ethical issues which if not taken may decline the human involvement in the process of teaching and learning. To control dominance of machines over human's curriculum should be upgraded in such away which will inculcate higher order skills such as reasoning, and critical thinking among students. To ensure AI based education to all, availability of infrastructure should be provided even to the most far-flung areas of the country.

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