Artificial Intelligence & Higher Education: A Comprehensive Overview

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Abstract

In recent years Artificial Intelligence (AI) is developing day by day. Higher education is also not untouched from it. Therefore, it is important to change the field and applications according to the need of current trends. AI is developing so many innovative strategies in various related area such as teaching, learning, administration, assessment, evaluation, budgeting and career advancement. Students also wants to learn according to their pace and demands, in this context AI supports them. Easy operation and variety of information provided by AI is also its important features which makes AI familiar for everyone. Although some security measures such as data privacy, unbiased results, input based subjective outcomes and data analytics are challenging for managing it with transparency and accuracy. In this research study researcher explored all possible dimensions of AI in higher education including all possible opportunities and challenges in recent years. Researcher included all recent in this study to understand the concept precisely. Also, this research study will be helpful for educators and policy makers for developing insights related to features of AI in higher education.

Keywords

Artificial Intelligence, Higher Education, Data Management, Automation

Introduction

In last few years AI has evolved in all areas where human resources are involved. The concept of automated work and machine learning is becoming advanced with AI. In various areas where thinking and logical skills included AI is working in magical ways with no time delays. Advance features of AI affecting various sectors, higher education is also equally affected from it. Siau, 2018 mentioned in his research study that thinking and reasoning ability of human brain can be operated by AI without any error and editing requirements. But this is also concerning concept for future dimensions. For example, there is a factory which is based on robotic machines for doing all manufacturing tasks. This is surety that this work will be completed without any error and without affecting the issues such as human fatigue and holiday concerns. But there are certain chances that employment concerns related to labour work, technical expert and freight work etc will be affected. There are chances that 6 people will be replaced by AI in companies (Gray,2017). Also, similar facts revealed in another research work which is conducted by scholars of Oxford University (Grace, Salvatier, Dafoe, Zhang, & Evans, 2017) mentioned that due to introducing AI in job skills and employment it is rising job risk of 47% for human resources in Unites States. Also, at global level in future there are the chances that 54% of the job and working sectors will be affected due to introducing AI in various job areas.

In this research paper researcher wants to highlight all possible inputs of AI in terms of its uses and drawbacks. This research study will be helpful for all administrator and curriculum developer for future directions and further recommendations.

Review of Related Literature

In this section researcher divided literature review in three segments which are : 1.Artificial Intelligence 2.Impacts of AI 3.AI affecting Higher Education. Here are some of the recent and related reviews mentioned here.
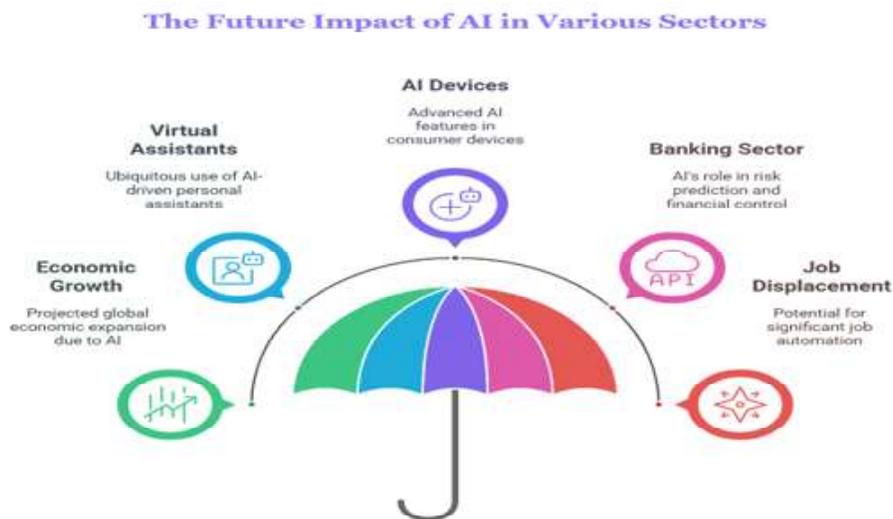
Reviews Related to Artificial Intelligence

In terms of work and application nature AI can be divided in two types: One can be called narrow AI, which is related to limited work and restricted for some specific tasks such as auto drive mode cars and bikes. Robotic machinery for specialized work such as cleaning, washing etc. Other category of AI has wider scope and having unlimited access of work. Also, it has the capacity beyond human brains and thinking

capability for doing many complex tasks and cognition-based work. This AI can be defined as general AI, which is also called AGI (Artificial General Intelligence). It also has the capacity to doing so many tasks at one time (Kurzweil, 2010; Voss, 2017). There are many famous scientists and industrialists mention in their speech that AGI can be threatening for development of human brain in future perspectives. In higher education AI generally using as a narrow AI, therefore in this research study researcher mentioned all research reports related to narrow AI.

Impacts of AI

In a council sponsored under Forbes Technology predict a certain assumption that by the year 2030 AI will not be limited only for some marketing and utility companies such as Youtube and Amazon like a chatbot services. Also, it is going to change the economic level at global level. There are the chances that in future economy at global level will be reached up to $15.7 trillion. There are many virtual assistance services such as Siri, Google Assistance and Cortana used by almost every person. Now in current days there are AI enabled devices such as mobile phones, laptops launched which are having advanced features like auto response, auto call answering and auto text replying. Also, in banking and finance sectors AI predicts accurately about market risks and finance control. Thus, somehow it is true that AI is making our lives simpler and reducing time for various tasks.

The Future Impact of AI in Various Sectors

AI Devices — Advanced AI features in consumer devices

Virtual Assistants — Ubiquitous use of AI-driven personal assistants

Banking Sector — AI's role in risk prediction and financial control

Economic Growth — Projected global economic expansion due to AI

Job Displacement — Potential for significant job automation

<u>Impacts of AI in Various Sectors in Future Contexts</u>

AI highlights some major issues related to human resource utility and cognition challenges (Siau and Wang, 2018; Siau and Yang, 2017). A research study from MIT highlighted that there are the chances that around 2.2 to 3.1 million jobs can be replaced by AI enabled machines (Rotman, 2017). Gray, 2017 mentioned in study that in next 120 years there are 50% chances all jobs will be replaced by automated and robotic machines.

In this research study he also surveyed around 350 scientists, on the basis of their predictions there are chances that around 70% jobs will be replaced by AI based applications in coming 50 years.

AI affecting Higher Education

Various job sectors which are based on AI are developing new jobs and new work scope which may arise challenging situation at worldwide level (Siau, 2017, 2018; Rainie & Anderson, 2017). There are so many reasons for which AI is being introduces in various job areas such as automation work, completion of work with no time, more accuracy, multiple tasks in single time etc. However, AI still need some advancement in some tasks which are complex and related to handling man power at multiple places. In higher education nature of work is depending on handling manpower in multiple ways with no time error. Therefore, AI need to be compatible and continuous in higher education.

AI can be very helpful in higher education in multiple ways. Major task in higher education are registration and curriculum development.AI can have broad effect on curriculum development. Some features of AI such as accuracy, speed, minimum time can be helpful for developing curriculum according to higher education. But there is also drawback that AI is still not have capacity for dealing with soft skills such has creativity, complex problem solving, innovation, legal rights awareness, community work, team building, dominance etc. But some hard skills which used in maths, engineering, calculation are doing better with collaboration with AI. Thus, it is important that students should be proficient in maths and science but at the same time students should get proper training for transferable skills. There are some new programs and courses which are included with machine learning and AI. These courses are not only related with computer courses. Other courses also including AI based machine learning. So, in terms of various courses machine learning and AI should be understand in terms of limitations, drawbacks and capacities.

In terms of student registration humanities and arts is discipline which is less affected area by AI. Finance and accounting affected by AI in terms of data formation and accounting details related to various problems. Therefore, this discipline having less registration. Countries which are developed and economically sounded have better opportunities for AI equipped courses. But such countries which are developing may face financial issues with as these courses may have higher cost for these countries. Therefore, at global level AI can create a financial gap. Other applications of AI can be as below:

AI Applications in Higher Education

Smart Education
Innovative learning solutions using AI

Virtual AI
AI technology for virtual assistance

Intelligent Tutoring
Personalized learning systems powered by AI

Teaching Assistant
AI tools for educational support

General Features of AI useful for Various Applications in Higher Education

Teaching, Learning & AI

In teaching learning system there are creative changes observed in recent years. Also, by introducing AI it is providing exploring experiences in education system. In the field of higher education where students are having developed cognitive brains and some of them also took interest in research area, it becomes more informative with inclusion of AI applications. Learning systems equipped with adaptive and AI powered features helps students for individual experience by every learner (Holmes et al., 2022). Many applications which are based on AI assistance, tools like automated AI assistance section, IMbots etc. help students according to their flexible time and able to get the solution of their problems accordingly (Luckin et al., 2021). In same context many advance features of AI with features like Virtual reality (VR) and Augmented Reality (AR) also helps students in learning in virtual mode with more live experiences (Popenici & Kerr, 2023).

Administrative Functioning & AI

Administrative tasks in educational institutions such as admission, examination, evaluation, correspondence etc. need to be managed on time without leaving any chances of error. AI in these tasks can be helpful due to its automated

functioning. AI also helps reducing chances of error and pressure of work (Zawacki-Richter et al., 2019). AI is having features such as data prediction, judgement related to upcoming risk such as chances of late admission, early withdrawal of admission, poor progress report etc. help institutions for preparing their strategy and plan of action for future perspective (Baker & Inventado, 2020). In terms of finance and accounting management with available resources AI helps in managing budget and finance control (Selwyn, 2022).

Challenges and Ethical Considerations

Despite its potential, AI in higher education raises significant challenges and ethical concerns. Bias in AI algorithms can perpetuate inequalities and discrimination, particularly for marginalized groups (Williamson, 2023). Data privacy and security are critical issues, as AI systems often rely on large datasets containing sensitive student information (Holmes et al., 2022). Additionally, over-reliance on AI may devalue human expertise and critical thinking skills, raising questions about the role of educators in an AI-driven world (Luckin et al., 2021).

Future Perspective with AI

AI in higher education is favourable for managing various functions with more efficiency and accuracy. Advanced features such as AI based Distributed Ledger Technology, AI based sustainable learning systems are supporting higher education in terms of managing complex administrative tasks (Popenici & Kerr, 2023). Data accuracy and transparency measures of AI should be included with legal inclusions and data privacy for managing various AI dependant tasks with assurance of quality work (Selwyn, 2022).
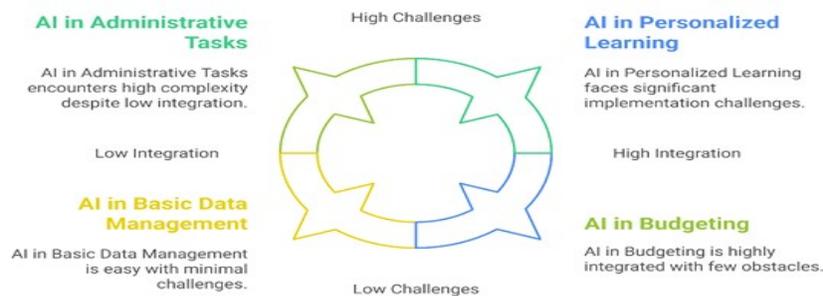
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Thus, AI is helping higher education in terms of providing better educational experience, managing complex data, administrative tasks of various levels. But alliance of educationist, policymakers and techno experts can provide better platform for extending features of AI incorporating measures of possible risks.

Conclusion

AI is having notable contribution in higher education. In terms of teaching, learning, administration, curriculum development, policy development and planning, financial management and many more small automated tasks AI is enhancing higher education in various ways. Although, it is also essential that students should understand the value of creative thinking and complex problem-solving strategy of human brain. Some technical and predictive challenges of AI should also be kept in mind so that data security and privacy related challenges being managed accordingly. Some social and judicial challenges should be kept in mind while using AI based application in sensitive fields such as finance management and budgeting. It is not possible in present world with technical era that AI should not be used but for better learning environment it is important to consider AI in various practices as supporting tool only, not to depend on it completely.

Thus, in this research study, researcher highlighted all major considerations of AI through which its collaborative advancement and features can evolve higher education at next level. Some restrictive measures and legal constraints should also keep in mind for preventive measures.

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