Innovative yet ethical: integrating AI and Technology in Higher Education

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Abstract

There have been numerous technological advances that all industries have witnessed in recent years, the education sector has also been impacted by the development of cutting-edge technology like Artificial Intelligence models, online and hybrid learning systems, automated, interactive learning solutions, and others. These advances have been embraced by institutions and learners with much enthusiasm, however the challenges posed by these innovative technologies are still creating roadblocks for implementing the systems. When any technological change is undertaken by educational institutions, the questions of Integrity and Ethics arise and the need to uphold these values in universities have a big impact on the experience that instructors and students have with technology.

Introduction

In recent years, the education sector, especially the higher education system has been revolutionized with multitude of technological advances that have also impacted the other industries. Educational institutions have been enthusiastic to accommodate and adopt the technologies such as intelligent tutoring systems, learning managements systems, virtual and online classrooms, adaptive platforms for real time projects and assessments, automated grading systems and chatbots for tutoring assistance (Negm, 2023). As institutions implemented technology at a fast pace, the trickle-down effects of innovation supported by ethics are yet to catch up to the advancements. As a result of multiple environmental factors like international policies governing student visas, Covid-19 restrictions, increased cost of in-person education, work and study models, many universities have adopted technology in the education system to assist students and instructors to increase efficiency and knowledge sharing (Rodríguez, García, Marín, & García, 2020). The need for ethical interventions in these technology-based systems have increased recently with many off-the-shelf solutions that assist students in writing like ChatGPT, and other Artificial Intelligence (AI) powered writing tools that are becoming popular; these ethical concerns have raised the question of innovation with ethics in the education system.

Artificial Intelligence and Technology in Education

There are various technology-based solutions that higher education institutions have implemented in the recent years. Universities have re-engineered their courses and curriculum to accommodate a varied range of students who have the option to be in-person, hybrid or remote based on multiple factors (Khan, 2023). Intelligent Tutoring Systems (ITS) is a computer based intelligent solution that can be used to imitate a human teacher to teach students on the platform, providing them with all the necessary course materials, customized learning modules based on the knowledge level and pace of the student, real time assistance and coaching. Learning Management Systems have also gained popularity during the pandemic years, as government restrictions and social distancing led to schools and universities being converted to online models of education. These systems provide a virtual learning and collaboration environment for both students and teachers to interact in, create and track tasks and submissions, provide learning materials and hyperlinks to students, and even make assessments online (Sirvent, Félix, & Darós, 2023). Adaptive Learning Platforms have also become sought after globally, as they are solutions that tailor their course content to individual student needs, and continue to evolve based on student interactions with the system and student level increase periodically. AI powered writing assistants are many in number, and offer assistance to students for writing, for reading, grammar and facts check, and many more. These solutions provide guidance and help to students in working on homework, writing style improvements, grammar,

and clarity suggestions. Automated grading systems are powered by Artificial intelligence to assist instructors in grading the students' work, tests and submissions; these systems are paired with online test modules and they evolve as the student answers the questions, by incremental questions in terms of complexity and course levels (Bibi, Yamin, Natividad, Rafique, Akhter, Fernandez, & Samad, 2024). Speech recognition and Text to speech systems provide assistance to learners of new language by transalting, support disabled students to communicate with hands free education and support systems. Predictive Analytics Tools have also been developed to analyze data sets or students and help them to analyze and forecast trends and possible future outcomes.

Literature Review

Impact on Policy and Future Integration of AI

The impact of AI on Higher Education (HE) is significant, leading to the need to develop comprehensive AI policies. Nevertheless, academic perceptions about AI's future integration vary globally. Some academics perceive threats to education from AI and form alliances as a survival mechanism in American universities; however, others are uncertain and anxious about the role of AI in teaching and learning (D'Agostino, 2023). D'Agostino argued that this uncertainty might lead to oppositional, values-based social groups. In Europe, attitudes toward AI applications are diverse and influenced by various factors, including the need for guidelines, policy implications, and a better understanding of the implications of AI implementation in academia (Irfan & Murray, 2023). On a different note, Knox (2023) stated that education in China is currently experiencing the impact of AI development in two main ways. First, central and regional governments actively guide educational institutions toward strategic AI research and training. Second, the corporate sector, which is increasingly influential, is developing AI applications that have the potential to standardize further and intensify the already competitive education system—a strong interest in private enterprise drives this development. AI is transforming HE differently worldwide and emerging as one of academia's most potent agents of change.

The educational potential of AI is widely acknowledged, but it is also widely recognized that AI should not replace human teachers. The role of educators remains crucial in guiding and mentoring students, fostering critical thinking skills, and providing emotional support (Cohen, 2023). While AI can deliver standardized content and assessments tirelessly, it lacks the empathy and emotional intelligence necessary for effective teaching and learning (Chan & Tsi, 2023). Yang et al. (2023) argued that the combination of AI and teachers' "human touch" holds the most promise for the future of education, as AI can assist with tasks like grading and personalizing learning materials. Most educators agree that the social and interpersonal nature of education and teachers' irreplaceable role emphasizes that AI should not replace human teachers but rather complement and enhance their roles in the educational process (Chan & Tsi, 2023). The current trend shows that the faculty role is becoming more like facilitators, guides, and mentors, leveraging AI tools to enhance instruction (AlDhaen, 2022).

To strike a balance when integrating AI into HE, institutions must adopt a strategic and cautious approach that enhances the quality of education, improves student learning, fosters innovation, and guarantees data privacy and security. Some considerations are essential, such as faculty training and support, responsible use of AI, adapting to technology, enhancing learning environments, and holistic approach by fostering collaboration and partnership between faculty from different disciplines (Hié & Thouary, 2023). Slagg (2023) also stressed the need for guardrails to keep AI technologies mission-centered, the importance of equity, transparency, and effectiveness as goals when using AI in education, and the recommendation to keep a human in the loop in the building, deployment, and governance of all education-focused automated systems.

Additionally, universities and colleges must teach students the skills they will need to thrive when AI is widely adopted in professional settings and identify ways to equip students with durable skills that are in high demand from employers and that enable graduates to perform tasks and adopt responsibilities that cannot be left in the hands of AI systems (Genone & Hughes, 2023). Ultimately, to effectively incorporate AI-related skills into university programs, institutions should embrace an interdisciplinary approach, integrate foundational AI courses into core computer science programs, consider specialized AI concentrations, explore integration across diverse disciplines, include courses on the ethical implications of

AI, emphasize hands-on projects and labs for practical experience, and foster industry collaboration for alignment with market demands.

Methodology

The study encompasses multiple perspectives to comprehend the ethical factor of implementing Artificial Intelligence technology in Education. A mixed methods approach was utilized to conducted qualitative and open-ended survey with instructors, students, policy makers in educational institutions and technological experts from the software service industry to understand their perception of ethical guidelines present and what is needed to ensure integrity of the technology-based education system. Responses that were diverse and form varied perspectives were collected and analyzed using thematic analysis, emerging patterns and themes were identified, and insights documented accordingly. Additionally, a thorough literature review was also conducted to gather and analyze academic journals, research articles, publications in renowned conferences and policies reviewed in the recent years to support the study and identify the need for this study. The below figure is an illustration of the increasing trends in analysis of keyword citation intensity on educational data ethics.

Figure 1 - Analysis of keyword citation intensity on educational data ethics.

Keywords	Year	Strength	Begin	End	2018 - 2023
information	2019	2.12	2019	2020	
big data analytics	2019	0.81	2019	2020	
architecture	2019	0.6	2019	2020	
academic library	2019	0.6	2019	2020	
privacy principle	2020	1.9	2020	2021	
university	2020	0.75	2020	2021	
systematic review	2021	0.71	2021	2023	
user acceptance	2021	0.47	2021	2023	
educational data mining	2021	0.47	2021	2023	
teacher	2021	0.47	2021	2023	
decision making	2021	0.47	2021	2023	

Source: Guan, X., Feng, X. & Islam, A.A. The dilemma and countermeasures of educational data ethics in the age of intelligence. Humanit Soc Sci Commun 10, 138 (2023). https://doi.org/10.1057/s41599-023-01633-x

Responsible Innovation with Ethical Considerations

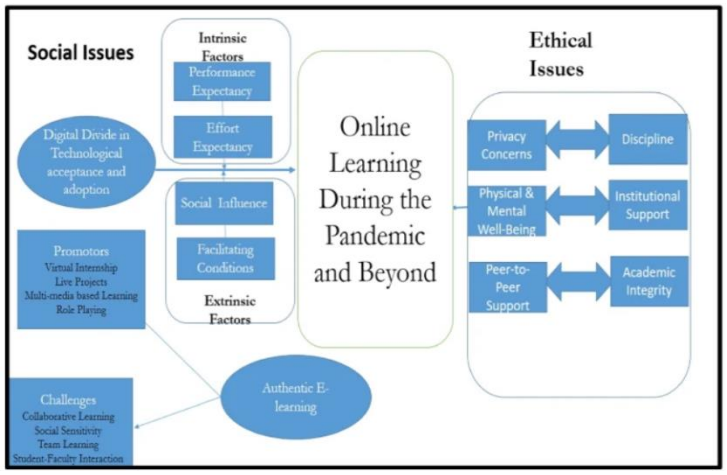
Technology powered education is being fast tracked due to the immense changes that are being experienced by the sector, and these changes and quick adaptations lead to gaps in ethical considerations for students, instructors, and the institutions. Artificial intelligence-based education systems are becoming more and more popular, with easily accessibility to students, tailored modules, real time support, faster turnaround in assessment times and bypassing geographical boundaries. All stakeholders in the education system must be enabled with the power of AI and be assigned ownership and accountability. Institutions need to foster an environment of support, responsibility, ethically sound guidelines and collaboration between students and instructors to ensure these guidelines are followed and technology is used as intended (Bu, 2022). Technology has transformed into an integral part of the daily lives of almost everyone, in all walks of life; thus it is pertinent that students ate educated and made aware of upcoming technologies and to get them familiarized with the solutions to stay up to date in technological trends which ultimately leads them to be easily employable with technology based skillsets and knowledge base. As a part of implementing artificial intelligence-based systems for learning and teaching, it is crucial for the education systems to assess the various ethical challenges that may be the impact of certain systems and mitigate acceding to the scope of these systems by following industry recognized ethical guidelines.

Artificial Intelligence and Ethical integration in Higher Education

Technology and artificial intelligence-based learning systems are advancing with time, and institutions can greatly benefit by implementing technology in education. The learning experience is elevated through these AI based systems, as course content can be moderated, students can be better guided with individual attention, provide enhanced knowledge-based systems for students to learn from and the entire course can

be made more efficient and learner focused. The ethical considerations and concerns related to the utility of these tools must be investigated before implementing, and all users must be provided with guidance of the use of systems and educated in ethical guidelines and consequences if they are not upheld.

Figure 2- Theoretical Model framework for Ethics and Online learning systems



Source: Bhattacharya, S., Murthy, V. & Bhattacharya, S. The social and ethical issues of online learning during the pandemic and beyond. Asian J Bus Ethics 11, 275–293 (2022). https://doi.org/10.1007/s13520-022-00148-z

Strategies for ethical AI integration

Ethical frameworks and models that are designed and developed by organizations because of rigorous research and robust studies must be followed as best practice guides. Universities can additionally set up an ethics committee to investigate any concerns that the stakeholders may have on AI and technology-based systems implemented. Ethics courses have also gained importance in the recent years, as all graduate level courses irrespective of the specialty have some credits for ethics courses for the students to learn mandatorily. These courses can be designed to guide students on the ethical use of technology, focusing on the long-term benefits of technology and the right use of the same. Ethical training for educators can also be made available so teachers and instructors can also be educated and made aware of these guidelines.

Limitations

Technology and artificial intelligence are evolving at a rapid pace, with newer technology and frequent updates replacing the older technology. These systems evolve using advanced models like machine learning, and natural language processing that the growth and advancement is witnessed in leaps and bounds. The study conducted has a limitation is the self-report measure which can be biased due to social desirability and high self-value of respondents. Longitudinal studies can also be performed over a period, assessing the perspectives of different groups of stakeholders before and after ethics courses. Culture, education background and technology know how additional factors can be considered for future studies to understand the mediating or moderating effects of the same.

Conclusion

The current utilization of General Artificial Intelligence (GAI), machine learning, and deep learning in classrooms and courses worldwide has revolutionized higher education (HE), representing a present reality rather than a future technology (Coffey, 2023). Higher Education institutions must digitally transform themselves and provide services that are fit for the future. Training educators to use AI tools skillfully and ensuring equitable access to these technologies are essential considerations in the integration process. The collaboration among technology experts, educators, and policymakers is crucial to maximizing the benefits of AI adoption. Implementing AI into HE requires a balanced approach that leverages the values of AI while ensuring that the role of human educators remains central to the learning experience. It involves providing faculty with the necessary support, developing accountable AI policies, and preparing students for an AI-infused future. Empowering students in the digital age is a necessary aspect of modern education, and

institutions need to take practical steps to close the gap and keep pace with the rate and scale of technological innovation. Implementing AI in HE faces challenges and barriers, including lack of skilled personnel, ethical concerns, digital divide, data privacy, and security issues, costs and budget constraints, integration with existing systems, lack of standardization, regulatory and policy challenges, and complexity of AI Systems. It primarily presents risks to academic integrity, overreliance on technology, exacerbated inequality, ethical concerns, and potential biases in AI systems. Leaders are confronted with cultivating academic policies and practices that not only bolster the equity and quality of education but also elevate learning outcomes, encourage innovation, and meticulously evaluate the future impact of AI on the labor market. Moreover, as educators navigate the implementation of AI, resolving challenges related to academic integrity, student motivation, and the demonstration of learning remains unresolved and requires careful consideration and determination. Conclusively, AI's current practices, challenges, and opportunities for HE requires further research to be fully understood.

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