Perception of Artificial Intelligence by Students

Subjects: Management

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Artificial Intelligence (AI) has become an integral part of people's daily lives and is available on all platforms, from smart homes to smartphones and autonomous cars. Students of economics and business studies at different levels of study have the differences in various aspects of the perception of artificial intelligence. Current college students will soon join a job market where proficiency in working with, developing, and managing AI will be necessary for many positions. Studying AI-related courses has become a necessary trend that offers significant benefits for students' future career development

Keywords: artificial intelligence ; undergraduate students ; postgraduate students ; education

1. Introduction

Artificial Intelligence (AI) has become an integral part of people's daily lives and is available on all platforms, from smart homes to smartphones and autonomous cars [1][2]. John McCarthy first presented the concept of AI at the Dortmund Conference in 1956, defining it as "human-like intelligent machines, especially intelligent computer programmes" [3]. AI can be understood as the computational ability to achieve goals in the world, with different types and degrees of intelligence found in humans, animals, and machines [4]. This relatively new concept has led to different definitions across various disciplines and fields. At its core, AI involves using high-level cognitive skills such as reasoning, problem-solving, and generalization to create intelligent behaviors [5].

AI has become an integral part of the education process, with materials and software equipped with skills such as abstract thinking, learning, adapting to new situations, and interaction, mimicking intelligent beings [6][7]. The use of these features and other active learning methods has found a place in the field of education, leading to an increasing number of studies utilizing artificial intelligence [8]. In the age of big data, AI applications are being developed rapidly, with effective use in areas such as banking, technology, and entertainment [9][10]. AI has also contributed to the development of various applications, including management systems, virtual classrooms, patient follow-up systems, game theory and strategic planning, hand, speech, face and pattern recognition, automation, and robotics [11].

The integration of AI is revolutionizing the education system, as it complements Industry 4.0 and Education 4.0. AI and education are deeply intertwined, and this technology is impacting social interaction in every aspect. As a result, new teaching and learning approaches are being developed and tested in various contexts [12]. Adaptive learning management systems, also known as intelligent teaching systems, are among the most common applications of AI in education [13]. These systems use AI techniques to model the teacher and create an individualized learning environment that suits the needs of each learner [11]. According to Halili [14], incorporating technological developments such as Industry 4.0, AI, augmented reality, cloud computing, and hologram in the education sector enhances productivity and creativity. Therefore, the use of technology in education will promote learning and increase success in all fields.

The study, according to Dergunova et al. [3] aimed to evaluate the perspectives of 98 engineering students on AI. Based on their responses to questions about intelligence and mind, it was concluded that the students did not have a precise understanding of these concepts. This lack of knowledge may indicate insufficient education in these areas. The research revealed that university students perceive AI as having great importance in education due to its ability to offer gamification, foster virtual reality, enhance critical thinking, and facilitate learning. On the other hand, most engineering students cited uncertainty as a major drawback of artificial intelligence, and the lack of communication and interaction in AI-powered vehicles was also deemed problematic. The growing prevalence of artificial intelligence applications may decrease the need for human labor in certain professions, which some students perceive as a disadvantage [3].

People are currently in an era where technology is advancing rapidly, leading to the integration of the concepts of mind and intelligence. Emerging technological products and materials featuring artificial intelligence are becoming prevalent across all sectors [9]. Given this trend, it is crucial to obtain the perspectives of upcoming economists regarding the field of AI [15]. Incorporating modern online and information tools into the curriculum is essential to educate young people

effectively in digital technologies, enabling them to develop relevant skills and mindsets. This involves fostering both creative and logical thinking, encouraging innovative use of cyberspace, and promoting a deeper understanding of ethics and humanities [16].

Furthermore, as undergraduate and postgraduate students may have varying levels of knowledge depending on their study programs, their perceptions of AI may differ. Younger generations today are beginning their adulthood during the early stages of the fourth industrial revolution, which could significantly impact them both positively and negatively due to the rapid technological advancements. According to UNESCO Education Sector [17], AI has made its way into the realm of education, where private entities are increasingly developing “intelligent”, “adaptive”, and “personalized” learning systems for use in schools and universities. However, the use of AI in education raises profound questions about what should be taught, how it should be taught, the changing role of professors, and the social and ethical implications of AI. Additionally, there are various challenges related to equity and accessibility in education. As such, an emerging consensus suggests that the very foundations of teaching and learning may be transformed by the integration of AI in education [17].

2. Usefulness of Statistics and Quantitative Methods

Statistics and quantitative methods play a significant role in economics by aiding in the study of market structures and understanding economic issues. Once these problems are comprehended, statistics help to resolve them by creating appropriate economic policies [18]. In every branch of economics, statistics is used to prove various economic theories and establish mathematical relationships between data sets [19]. Economists can present precise facts about economics and determine cause-and-effect relationships between different variables. Statistics is a science that assists students in learning from data, using proper analysis techniques, and effectively presenting their findings [20]. It is a subject that focuses on the processes of making scientific discoveries, utilizing data to make informed decisions and predictions, and deeply understanding various economic topics [21]. This is especially important in today’s age, where numerous sources of information exist with interpretations that may have unknown motives [22].

A survey conducted among 101 students in the master’s degree program in Economics and Business at the University of Maribor indicates a significant and positive correlation between students’ attitudes toward quantitative methods and their intentions to utilize them in the future [23]. The trustworthiness of analyses and predictions is enhanced by the use of statistical techniques. Furthermore, statistics serves as the foundation for research in almost all scientific fields and is utilized by various private and public sector industries [21]. As a result, students with knowledge of statistics have a broad range of employment opportunities in the digital age [24]. For example, machine learning is a subset of artificial intelligence that enables a model to automatically learn from data, and the algorithm utilizes this knowledge to make predictions. As people input more data, the accuracy of the algorithm’s predictions increases. To identify specific patterns, statistics play a crucial role in studying the data, and providing guidance for analyzing and presenting raw data [25]. This approach is widely used in computer vision and speech analysis to uncover previously unseen patterns. From this point of view, statistics and quantitative methods are an important basis for understanding artificial intelligence [21].

On the other hand, Peters et al. [26] noted that student attitudes play a crucial role in statistics education as the course material can be demanding, necessitating students to exercise critical thinking, analysis, and interpretation skills. As a consequence, students may find statistics to be both challenging and uninteresting [27]. In accordance with Songsore and White’s research, students considered statistics topics significant when they could be relevantly applied to their daily lives, as well as their academic and career-related interests [21].

3. The Student’s Knowledge of the Meaning of Artificial Intelligence

Jha et al. [28] found that the level of understanding among undergraduate medical students regarding AI and its potential implications for healthcare was low, and they did not exhibit any concerns about the impact of AI on healthcare.

Doumat et al. [29] found among 206 medical undergraduate Lebanese students that 59.7% of the undergraduate students believed they had a solid understanding of the fundamental concepts of AI. Moreover, there was no notable statistical variance in knowledge between male and female respondents. Among the 38 studies examined, 26 investigated the level of awareness of AI among healthcare students. Out of these, 18 studies indicated that the student’s knowledge level was subpar, at 50% [30].

Ahmed’s study [31] showed that only 35.3% of the 470 participants had a fundamental grasp of AI. Notably, the majority of the knowledgeable participants were men, and almost 77% of them were unaware of AI’s use in medicine. These findings

illustrate that despite having a basic understanding of AI, medical students may not be familiar with its practical applications [30].

The objective of the study, according to Ural Keleş and Aydın [32] was to explore the perceptions of university students toward artificial intelligence. The study included 42 students from the Faculty of Education, 47 from the Faculty of Arts and Sciences, and 41 from the Faculty of Economics and Administrative Sciences. The findings revealed that students from the Faculty of Education had a more comprehensive understanding of artificial intelligence compared to their counterparts in the Faculty of Economics and Administrative Sciences and the Faculty of Arts and Sciences. Additionally, the study highlighted that negative perceptions towards AI were more prominent than positive perceptions among all sample groups.

4. Students' Perception of the Usefulness of AI in Their Study

The era of AI presents both challenges and opportunities for education [33][34]. With the emergence of new learning channels, such as learning management systems based on digital textbooks, personalized learning through big data analysis, interactive technologies utilizing voice recognition and speech synthesis, and chatbots driven by natural language processing, the majority of AI technologies have educational and instructional applications [35][36]. The integration of AI in education has the potential to enhance educational material, revolutionize educational approaches, and disrupt traditional educational paradigms [35].

In recent years, significant advancements in AI have positioned it as an emerging technology with the potential to revolutionize the education and health industries. While higher education has already begun incorporating AI, many educators remain unaware of its capabilities [37].

The study according to Joshi et al. [38] shows that professors and students would benefit from a better understanding of how AI can improve their skills in education. Moreover, the study highlights that the optimal utilization of AI technology can lead to improved outcomes in education.

Kumar and Raman [1] carried out research on 682 students of the Business Management Master program. This research shows that there is a strong positive correlation between the student's perception of the use of AI in academia and their view that AI should be used in the Teaching and Learning Process. The qualitative data collected shows that the students view that using AI in the teaching-learning process can help in enhancing the process and make the process more efficient.

The study, according to Kairu [37], on 385 students shows that 39.06% agreed that AI would have a positive impact on education, and 49.48% agreed that it would influence learning. Students also recognized AI's potential to track student progress (35.79%), enhance teacher-student interactions (47.78%), and measure classroom engagement (55.21%). The impact of AI is increasingly felt in the education sector, where it serves as an auxiliary tool to enhance the teaching and learning process.

5. Students' Perception of Work Skills for the Future

According to OECD [39], AI is not expected to replace workers whose jobs involve creativity, and it is also not likely to replace those whose jobs require complex social interactions. For a long time, cognitive skills have been deemed the most crucial factor for employment success. However, recent studies suggest that social and emotional skills play a direct role in determining occupational status and income. In fact, social and emotional skills can be equally, and in some cases, even more, important than cognitive skills in determining future employment prospects [39].

As automation takes over tasks that were once performed by humans, the world people know is changing rapidly in the digital age. The advent of the fourth industrial revolution underscores the need for individuals of all ages to comprehend and develop the skills necessary for the future of work, including understanding new technologies and complex processes [40]. According to studies by Bristows [41] and Qlik [42], while most people have a general understanding of what AI is, they lack a clear comprehension of how AI systems function.

Moreover, a survey conducted by Northeastern University-Gallup [43] found that a majority of university graduates do not feel adequately equipped to work in an AI environment. Similarly, a study by Hult International Business School titled "Visions of the Future" revealed that only 20% of 400 undergraduates studying in the UK and USA felt "very prepared", while 62% felt "somewhat prepared" and the remaining 18% did not feel prepared at all. This disparity between academic

preparation and industry expectations is significant, as employers seek graduates with advanced technical skills, such as computing or ICT expertise [44].

Unfortunately, university curricula are often supply-driven, driven by academic traditions and lecturer interests, and do not necessarily align with labor market needs, especially with regards to requisite skills [45]. This mismatch between students' and employers' perceptions and expectations of the skills obtained through degree programs could result in producing graduates unprepared for the evolving AI work environment [46].

Abdelwahab et al. [34] in their study on 95 students from 27 higher education institutions (HEI) in the Netherlands found that students and graduates studying at HEIs in the country generally believe that their knowledge and understanding of AI are inadequate to grasp its potential impacts on their future careers.

6. Students' Perception of Emerging Jobs in the Data and AI Cluster

The utilization of automation, AI, and other advanced technologies is on the rise, resulting in job transformations. In 2020, COVID-19 expedited this trend and is expected to further expedite digitization, which may become permanent in certain domains [47]. The evolving landscape of technology is rapidly transforming the nature of work, especially with the advancements in AI. Nearly 50% of today's jobs will be obsolete by 2030, specifically, those that can be replaced by algorithm-based machines. As a result, free enterprise is facilitating the growth of new tech-related jobs, and the need for skilled computer technicians will continue to rise as technology increasingly permeates people's world and daily lives [48].

Moreover, the advent of technology will simplify and enhance daily life, as physically strenuous and less mentally demanding jobs are replaced by those that require creativity and cognitive skills. AI is an interdisciplinary field that encompasses computer science, math, engineering, and related disciplines [49]. Some examples of AI applications include natural language processing, image recognition, robotics, and decision-making algorithms. To create machine learning algorithms, data must be analyzed to produce predictions or decisions, which is crucial for developing AI models capable of recognizing patterns, anticipating outcomes, and learning from experience [50].

The creation and implementation of AI systems require a broad range of abilities, including machine learning, natural language processing, data science, deep learning, computing, robotics, and problem-solving. Proficiency in programming languages, frameworks, and development tools is also necessary for AI experts. Acquiring these skills can provide professionals with a competitive edge and open doors to exciting career opportunities [4][15][38][51].

The McKinsey Global Institute predicts that AI may displace 15–30% of the global workforce, which translates to 400 million to 800 million workers, by 2030, and the increasing use of AI in machinery may require millions more people to switch careers or improve their skills [52]. Consequently, immediate research into these issues is crucial since current college students will soon join a job market where proficiency in working with, developing, and managing AI will be necessary for many positions. Therefore, studying AI-related courses has become a necessary trend that offers significant benefits for students' future career development [39][53].

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