

The Impact of Artificial Intelligence on Higher Education: An Empirical Study

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Abstract:

Artificial intelligence (AI) has been a topic of growing interest and investigation in various fields, including higher education. This research article explores the impact of AI on higher education by examining its effects on teaching and learning, assessment, ethics, required skills, and future careers. The aim of this study is to analyse the influence of AI on higher education, investigate its impact on the teaching and learning process, examine its effect on assessment and grading, and predict its influence on graduates' future careers. To accomplish this, the study employs a qualitative approach based on a survey of the higher education audience. The results of this study demonstrate the crucial role of AI in the future of higher education. The findings highlight the effectiveness and efficiency of AI in equipping graduates with new skills for their future careers. They also emphasise the importance of considering the ethical implications of AI. The study reveals that higher education institutions need to integrate AI more extensively in their programs to prepare graduates for the future workforce.

AI has the potential to revolutionize education by personalizing teaching methods to suit individual student needs, providing prompt feedback, and automating administrative tasks. It can also assist in grading and assessment, freeing educators to focus on developing curriculum and providing quality instruction. The study findings suggest that AI has a positive impact on the learning experience by facilitating the acquisition of new knowledge and skills. This research provides insights into the potential of AI to transform higher education and contribute to the development of new skills for graduates. It has important implications for educators, policy-makers, and other stakeholders in the higher education sector. The study findings suggest that AI should be more extensively integrated into higher education curricula, and that institutions need to consider the ethical implications of AI in the development and implementation of their programs. By doing so, they can better prepare graduates for the demands of the future workforce.

Keywords: AI; Higher education; impact; learning & teaching

1. Introduction:

Artificial intelligence (AI) is a vast branch of computer science concerned with developing intelligent computers capable of doing tasks that typically need human intelligence. Siri, Alexa, self-driving cars, Robo-advisors, talking bots, and email spam filters are examples of AI (Stanford Encyclopaedia of Philosophy, 2020). AI is the world's new trend as it has proved more efficient in many fields, mainly during the COVID-19 pandemic (Vaishya et al., 2020). AI helped fight the virus and globally rescued jobs and educational systems (UNESCO, 2020). Thus, it is vital to shedding light on how AI will impact one of the essential areas of life, higher education. This research article studies how AI impacts higher education based on previous studies and participants' experiences, views, and predictions.

2. Literature review

Currently, AI has become a vital part of the virtual world. Unquestionably, AI plays an important role in general education and higher education (Edtech, 2020). For example, the efficient uses of filtering emails, advertising, applications, YouTube, and virtual assistants such as Google, digital libraries, Google Scholar, and other digital research engines in any higher institution worldwide (García-Vélez et al., 2021). However, AI is weak and robust, according to Ma & Siau (2018). In other words, Ma and Siau (2018) label AI as fragile when it is limited to small, restricted, and structured tasks such as collecting data. The latter researchers label AI as sharp and robust when performing most or all cognitive tasks are typically human (Beight & Reddell, 2005). Although AI plays a vital role currently, the researchers mentioned above consider AI a threat to human civilisation and support their argument with what experts in the field think about AI, such as Bill Gates, Elon Musk and Stephen Hawking (Ma & Siau, 2018). Undeniably, what is mentioned above about AI is vital. Still, at the same time, it is questionable for any critical-thinking reader as any further investigation remains possible, and the truth is never absolute. So, how would AI impact the learning and teaching processes?

2.1 AI impact on the learning and teaching process

Dealing with the impact of AI on learning and teaching in higher education, it is evident that AI will impact higher education in many ways and mainly in two focal areas: enrollment and curriculum (Taneri, 2020). For instance, Ma and Siau (2018) maintain that AI will speed consistency and accuracy in curriculum and registration. Furthermore, according to Ma and Siau (2018), human sciences and liberal arts majors will become more popular because these areas of study are less vulnerable to the field of AI than other areas, such as accounting and finance (Ma & Siau, 2018).

Although this study is essential for a load of information on the influence of AI on higher education, it can be criticised for not tackling the issue genuinely, as the impact is much more profound. Indeed, focusing on the learning and teaching process, no one would doubt that AI is replacing the lecturer or tutor in many ways, such as blended learning and e-learning. The presence of an e-learning lecturer is limited as the learner interacts with a virtual classroom, whether on Blackboard, Moodle, Turnitin or any other platform (Jlu & Laurie A, 2018). Equally, Professor Roland T Chin from Hong Kong Baptist University (2018) believes that AI is meant to revolutionise how we learn, teach, work, live, make decisions, and be ready for the AI era. Therefore, AI is not only about its superficial effect, but about radical changes in the teaching and learning process in depth (Chin, 2018).

What reinforces this idea conditionally is the argument from Princeton's Head of Computer Science, Jennifer Rexford. She surmises that AI is efficient in learning and

teaching if others learn: “Learning how people learn will hopefully help us and others think more broadly about retraining down the road” (Rexford, 2018). Hence, according to Jennifer, the efficiency of AI is provisional, as understanding learning styles is the only key to success. Alike, Jabar and Yousif (2011) argue that the learning process in this world is becoming more interactive and engaging, according to recent researchers, because e-learning provides the learner with artistic and pedagogical features as well as incorporates and deals with countless types of content which react effectively to the students’ needs (Jabar and Yousif, 2011).

The absence of striking examples of how AI impacts the learner’s daily life can be a limitation of the approach of Jabar and Yousif, highlighted below in the Education and Unit Study. For example, AI provides deep learning and teaching processes to get higher performance from both the tutor and the tutee. For example, adopting hypermedia for a writing class facilitates mistakes and reduces time consumption. For example, before discovering AI, it took ages for a teacher to assess and grade papers and check for plagiarism. Thanks to AI, checking for academic integrity and language issues takes minutes or less. Indeed, using artificial intelligence, a lecturer submits the work to Turnitin, Grammarly, or other software. In minimal time, it can provide constructive feedback based on the results generated by the software used.

Although AI is perfect in covering language and academic integrity issues, semantic, pragmatic, and cognitive levels, in many cases, require the intervention of the human mind to perform the last touch (Mellul, 2018). Nevertheless, AI offers various learners links about the topics required by the subject matter and eases and inspires both learner and tutor by addressing different learning styles such as autonomous learning, visual learning, e-learning, audio-visual learning, and deep learning. Equally, AI enables the tutor to select and apply the learning method taxonomy that the learner needs and highlights the areas of improvement to be focused on (Jabar and Yousif, 2011). Meanwhile, AI reinforces independent learning as the learner becomes autonomous and free to access input anytime and anywhere. Finally, according to Richer (1985), AI positively influences education by providing intelligent computer-assisted instruction that facilitates learning intuition and provides expert systems to diagnose and assess learning outcomes (Richer, 1985). It is undoubtedly clear that AI adds a lot to the learning and teaching process, so what about assessments and grading?

2.2 Impact of AI on the assessment and classification process

AI does not impact only the learning and teaching process but also the assessing and grading process. For instance, AI checks assignments and research projects through software such as Turnitin against billions of resources in no time. Consequently, similarities are easily generated to judge whether the learner plagiarised. Similarly, online rubrics and grading forms are added to assignments with criteria and scales, and final grades are automatically added to the submitted work without any hassle (Mahana et al., 2012). Furthermore, AI offers interactive ways of providing constructive feedback to the learner, easy access in a relaxed manner anytime and anywhere, with more privacy and autonomy. Additionally, the instructor can write or record feedback to facilitate and improve learning from errors.

Also, referring to a study by Stanford University, AI is applied to evaluate students’ responses and create a computer model that endorses rules inferred from the tutor's grading

decisions. What is specific about AI is that it improves learning instead of making a final authoritative decision. In addition, it reflects more transparency, trust, and quality control (Stanford University, 2019). In the same context, Tovia Smith, in her article “More states opting to Robo-Grade’ Student Essays by computer,” argues that rob-graders (robots used for grading students’ papers) are increasingly used to grade students’ essays mainly in Utah, Ohio and soon Massachusetts to follow (Brad Rose Consulting, 2019). Similarly, a research professor at Colorado University named Peter Foltz says they have AI techniques that can judge up to 100 features and that grading essay is highly accurate (Brad Rose Consulting, 2019). In short, artificial intelligence is playing a more prominent role in the evaluation and classification of higher education in the United States of America.

Though the above studies are valuable from different perspectives in addressing the role of AI in grading and assessing the learner and facilitating the role of the instructor, a critical thinker would not fail to pose the following questions: What about bias in marking reports? Who would guarantee that AI is fair and objective? What about the human side of the learning process and assessment? Will AI consider the psychology of learner grading or assessing a paper?

2.3 AI Impact on Future Careers of Graduates

AI affects the world of education, but it also seems restricted to this area and follows the learner even after graduation. For instance, according to Wang and Siau (2017), AI will impact the future job market of required skillsets. It will replace many other studies that involve routine tasks and structures that are easy to automate instead of unstructured disciplines that require complex cognitive interference (Wang & Siau, 2017). AI or computer assessment is not limited to grading papers but can be the gateway to a future career. For instance, a human may not read CVs but be screened by an algorithm specialised in candidate shortlisting. As an example, in an article by the Economist entitled “How algorithms may decide your career: getting a job means getting past the computer”, it is reported that the largest firms are now using computer programs or algorithms to select candidates with an applicant tracking system (ATS) which can reject up to 75% of candidates. The above policy pushed applicants to use keywords to maximise screening interests (Brad Rose Consulting, 2019).

Vodafone and Intel are not satisfied with shortlisting CVs but instead use a computer-driven visual interviews service called “HireVue” to further select candidates. In this process, AI analyses facial expressions and language patterns and decides to pass or fail the applicant (Brad Rose Consulting, 2019). According to a study by Frey & Osborne (2013), the number of jobs at risk that will be computerised and include advances in robotics and machine learning is roughly 47% of US total employment (Frey & Osborne, 2013). Likewise, Dizikes (2020) refers to research conducted by Daron Acemoglu and Pascual Resrego from MIT University that each added robot replaces 5.6 workers, almost equal to six people (Dizikes, 2020).

Similarly, similar research conducted by Ma & Siau (2018) of Oxford University argues that within the next 20 years, around 47% of jobs in the United States of America and almost 54% in Europe are at risk due to AI (Ma & Siau, 2018). Additionally, the latter researchers at Oxford University forecast that AI will write high-school essays by 2026, write best-selling books by 2049, translate languages by 2024 and perform surgeries by 2053. Chin (2018) from Hong Kong University argues that there are overlooked AI

examples or less obvious ones such as translation machines that enable you to speak to anyone with any language instantaneously. Chin (2018) added that JPMorgan Chase and Co use a learning machine that deals with loan agreement processes and saves 360 000 hours of work by accountants and lawyers (Chin, 2018).

Although all the values stated above about how AI is creeping into the career world, Ma and Siau (2018) criticise these aspects arguing that when it comes to soft skills such as empathy, communication, collaboration, innovation, critical thinking, problem solving, and leadership, AI is not as robust as human cognitive ability (Ma & Siau, 2018). Both researchers reinforce their views by suggesting that higher institutions should provide soft and hard skills such as maths, IT, and engineering while training students. They think AI may not be capable of affording these skills for future business careers (Ma & Siau, 2018). Although computer-driven screening is believed to avoid biases in the traditional recruitment process, AI is not bias-free. That algorithm can favour candidates with time and money to continually re-tool their resumes (Brad Rose Consulting, 2019).

To end the conflict with a culminating result, Chin (2018) argues that citizens of the new world order require new skills. These skills should include interpersonal skills such as adaptability, critical thinking, conflict resolution capabilities, and other cognitive skills. Steve Jobs thinks, 'It is technology married with the liberal arts, married with the humanities that yields us the results that make our heart sing' (Henn et al., 2005). How would higher education impact AI? Undoubtedly, the world is getting more innovative, and AI has rehabilitated our world by putting natural languages and data by enabling Siri, Netflix, Facebook, Google, Alexa, Amazon, and many other platforms as part of our daily life (Oblinger, 2018). However, the question arises: How will higher education affect AI? This research paper will address these issues from the two focal points of ethics and cognition as answers to these issues.

2.4 Cognitive and ethical impacts of higher education on AI

Dealing with ethics in AI is a lecturer in learning science and innovation at the Institute of Educational Technology in the UK. Holmes (2018), discussing the impact of AI on education, raised the importance of adopting ethics in AI education. The same lecturer argues that whether we like it or not, AI is being deployed in higher institutions worldwide and significantly impacts the future of higher education. Similarly, he adds that by 2024 the global AIED market will be worth 4.5 billion pounds. Companies such as Google, Facebook, and Amazon invest millions of dollars in developing AI in education (Drabwell, 2018).

However, Holmes (2018) believes that 'adaptive' or 'personalised' ethical learning systems are not entirely taken into account. He also stressed that there is a 'moral vacuum' without guidelines, policies, regulations, or research done to stress the specific ethical issues raised by AI in education (Holmes, 2018). The question is not a question of data for him, but instead is an issue of morality and that is why he asks: *“How can we be sure that the data are accurate, who owns and controls the data, and how is student privacy maintained?”* According to Holmes (2018), AIED ethics should not be reduced to questioning data and controlling the potential of bias that is incorporated in AIED computational approaches, algorithms, and the decisions taken by the AI's deep neural networks that are not quickly inspected and that he describes as “known unknowns” (Holmes, 2018). *Whether anyone likes it or not, AI has quietly entered the university*

campus, but little attention has been paid to ethics. To give just one example, what happens if a student is subjected to a limited set of algorithms that impact negatively and incorrectly on their assessments?” What is inferred from this study is that higher education should give more importance to the ethical part while teaching AI.

To address the ethical issue of AI, and as an example, Open University in the UK conducted workshops involving researchers around the world on AIED in 2018 at the AI in Education International Conference. Participants considered the importance of doing empirical work to address systematic biases in learning machine models and create impenetrable algorithm black boxes and AI ethics-driven courses. Therefore, Open University started using “Chatbots”, an internet-based program designed to simulate conversation with users. Communicates through text messages through websites, applications, or instant messengers to support students and staff (Drabwell, 2018). Likewise, higher education institutions should think of security and privacy issues. When it comes to AI, these burning issues, despite the rosy promises of AI humans, have to address this ethical issue, with intelligent systems monitoring our faces 24 hours a day with only a few elements of our private life remaining untouched. Are there legal frameworks, policies, or ethical codes to control the brutality of AI? Moreover, we should consider robot cops and their ability to kill and hold them without human ethics.

AI raises many social issues that are more complex than technological ones, such as ethics, privacy, and inequality, which entails that we need STEM and technology graduates and graduates who are deeply grounded in humanities and arts. With liberal arts education, intellectual and ethical growth will be an opportunity that integrates compassion, civic-minded citizens, responsibility, and ethics.

2.5 Cognitive impact of higher education on AI

Thinking cognitively, AI has made it a present-day reality that imitates humans in many functions such as language translation, medical diagnostics, and decision making. If humans interact, analyse, deduce, think logically, and reason contextually, AI performs these actions artificially based on powerful computers, high-speed internet connections, algorithms and extensive real-time data (Chin, 2018).

However, unlike humans’ AI performs fixed and domain-specific tasks with unmatched learning speed, extensive data, excellent efficiency and unlimited computing capacity. On the contrary, humans learn flexibly, pose, and solve issues creatively, think critically, and innovate adaptively (Chin, 2018). Despite the above facts about humans, AI, deep learning, and ample data supply, AI has surpassed average human performance in manufacturing automation and face recognition. For example, it is expected to perform enormous tasks (Chin, 2018). Professor Ronald T Chin relates a story of two robots trained to communicate at a sophisticated level. They were found later speaking to each other in a language they had developed, which spooked the scientist and caused him to shut down the project. Therefore, AI may not be as cooperative as expected (Chin, 2018). Here lies the question, what have higher education institutions done to monitor and control the cognitive wilderness of AI? The issue is not creating a sophisticated language that humans would not grasp, but more than that. Even more astonishing is that their idea of embedding AI in human intelligence is forthcoming. Scientists think of hardwiring human brains to implant a neuro-electronic chip into human heads, enabling communication via voice or texts through the cloud to brain signals that connect the internet (Chin, 2018).

Recently in 2017 and in many TV talk shows around the world, a humanoid robot named Sophia developed in Hong Kong dazzled audiences by officially joining a recent United Nations Summit as a panelist to address issues of inequality and said: *“The future is already here. It is not very evenly distributed. If we are smarter and focused on win-win results, AI could help to efficiently distribute the existing resources of the world, such as food and energy”* (Guardian News, 2017). Again, where is the role of the higher institution in creating a boundary for empowering the AI with highly sophisticated cognitive skills that transgress the human mind and frees itself from the human aspect as the robot killer and robot cop and perhaps much more? Against this tremendous growth in the AI world, one should not forget that progress has been made by improving people and not improving machines, as the science fiction author Tchaikovsky (2018) argues. In short, this statement empowers humans over AI because any cognitive intelligence AI owns, first of all, is inherited or programmed by a human mind that can ultimately control this potential (Chin, 2018).

3. Situation of the problem

The twenty-first century has posed many challenges to the new world order. The influence of AI on higher education and the impact of higher education on AI are two crucial areas, among many others, worth studying (United Nations, 2018). Thus, the research questions of this article are: What is the impact of AI on higher education? Alternatively, how is higher education going to impact AI?

Aims of the study

[1] To study the impact of AI on higher education.

[2] Investigate the impact of AI on the learning and teaching process.

[3] To study AI impact on the assessments and grading process

[4] To predict the impact of AI on future careers of graduates

4. Method

This research paper uses objectivism as a philosophy, as the data collected are based on perceptions, feelings, and experiences. Objectivism entails realism, and ontologically, it considers social entities as physical ones making the world independently (Saunders et al., 2009). Therefore, this article uses the qualitative method to investigate the topic raised. The qualitative approach focuses on collecting data from people’s experiences, views, and feelings dealing with AI in higher education and life in general (Hammersley, 2012). A qualitative survey was used to ensure the quality and authenticity of the data collected. The survey comprises ten questions aligned with the research paper topic forwarded to participants via Office 365 Form (Treharne & Riggs, 2015). The survey targeted an audience made of higher education students (50), academic staff (34), decision-makers and managers (8). The audience comprises international academic staff, students, managers, and decision-makers with different cultural and educational backgrounds. Overall, 92 participants responded that they are both men (62) and women (30) aged between 20 and 60 years and are current students and academic staff from different institutions. The survey link was shared on Facebook with selected colleagues and alums students who have a background in higher education and AI to ensure the validity of data collected from different countries during the academic year 2020-21. The first question was created to ensure that participants belong to the higher education field. If not, then he/she is eliminated

automatically. The survey targeted participants worldwide via a link forwarded via emails, Facebook, and WhatsApp to ease participants' contribution (Liang & Zhu, 2017).

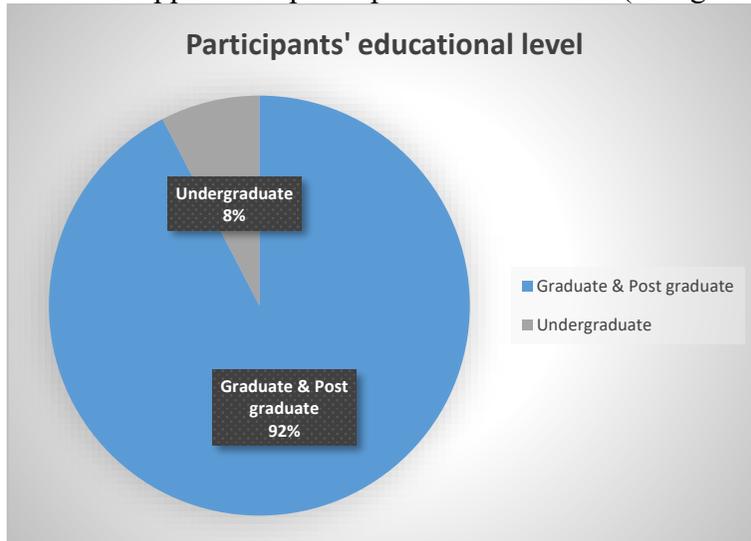


Figure 1. Participants' educational level

4.1 Material

Data collection was based on primary and secondary data. The preliminary data was collected through a qualitative survey and secondary data was collected by investigating previous studies. The secondary data used mainly academic resources from the Web of Science, Scopus, ERIC and Emerald, and limited grey literature.

4.2 Data analysis

Data analysis is deconstructing data and breaking down data collected into categories and codes. Then, interpretation by giving a sense of and understanding of the principles generated and exploring theories would help explain relationships. Finally, reconstruct data by systematically recreating and repackaging the significant themes and codes (Sergeant, 2012).

5. Findings

The results collected through the survey reveal that AI will significantly impact higher education in many areas, such as learning and teaching methods, assessing and grading, skills required for future work, and future graduate careers.

5.1 AI impact on the learning and teaching process

First, concerning the idea that AI affects higher education, the results reveal that most agree with 73 "Yes" that AI affects higher education. However, 17 participants think 'Maybe' and only 2 say 'No' AI will not impact higher education.

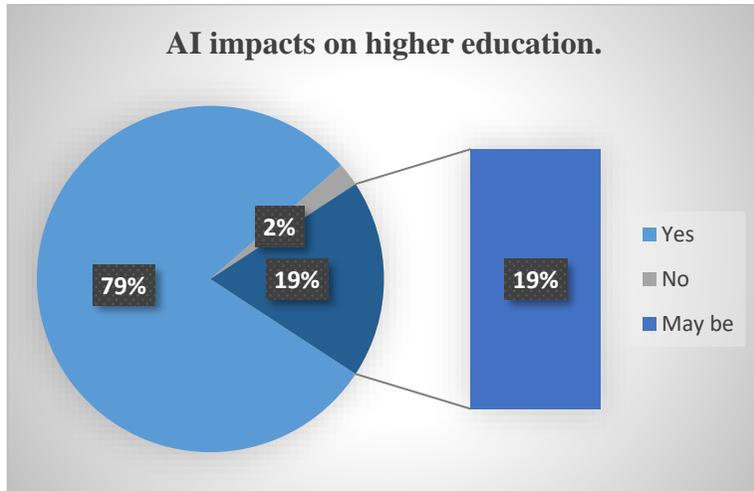


Figure 2. Impact of AI on higher education

AI uses better learning styles and teaching methods in higher education than humans. The responses reveal that 40 participants strongly agree, 14 agree that AI uses better learning styles and teaching methods than humans, compared to 19 participants who disagree, 6 strongly disagree, and 23 are neutral.

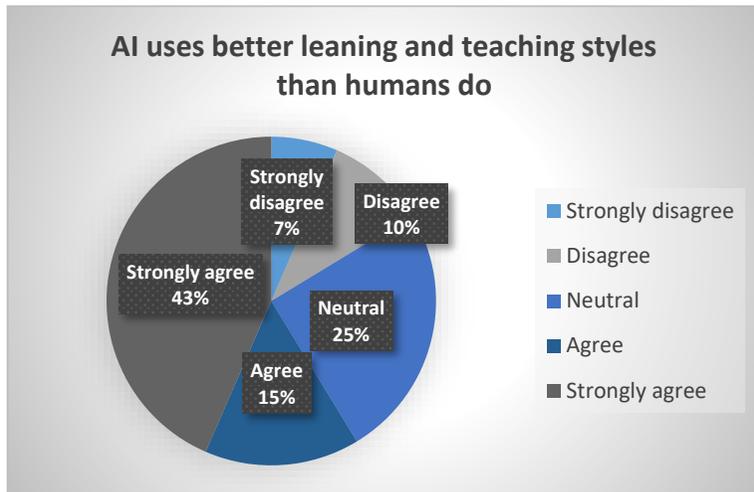


Figure 3. AI uses better learning and teaching styles than humans.

5.2 Impact of AI on the assessment and classification process

Concerning the effects of AI on assessments and classification, the vast majority of participants, 64, strongly agree that AI is more effective, accurate, and objective in evaluating and grading complex and straightforward tasks than humans. However, 19 participants were neutral, 2 strongly disagreed, and 7 disagreed.

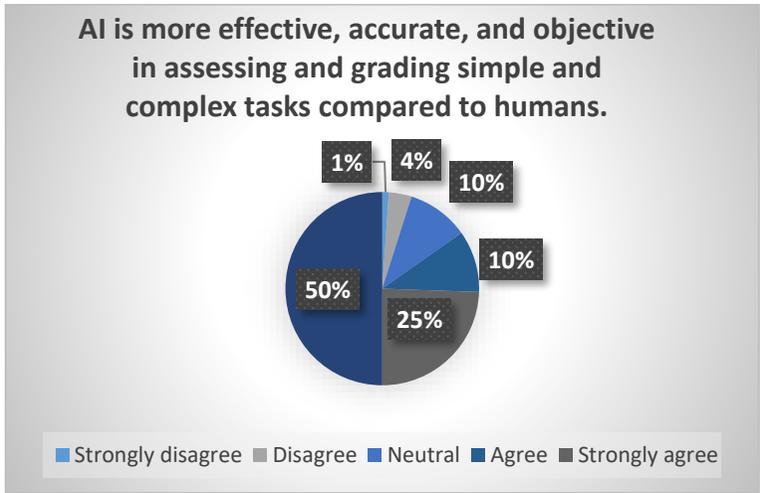


Figure 4. AI impact on assessment and grading process

5.3 AI Impact on Future Careers of Graduates

Regarding the fact, how will AI impact the future career of higher education students? Findings reveal that 50 participants think the impact will be positive, and 3 think the effect will be negative. However, 39 believe that the effect will be negative and positive, with no participants saying there will be no impact.

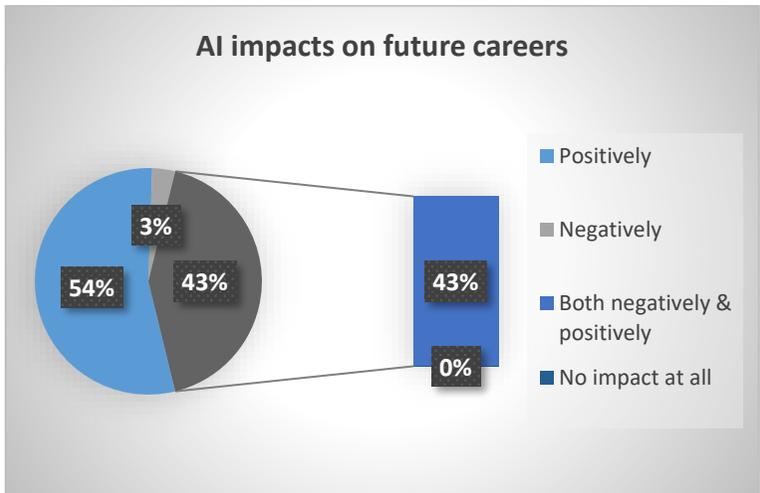


Figure 5. Impact of AI on future careers

Likewise, results reveal that 76 think “Yes” we need to teach students new skills to meet future career requirements dictated by AI, only 2 participants think “no”, and 14 think “Maybe”.

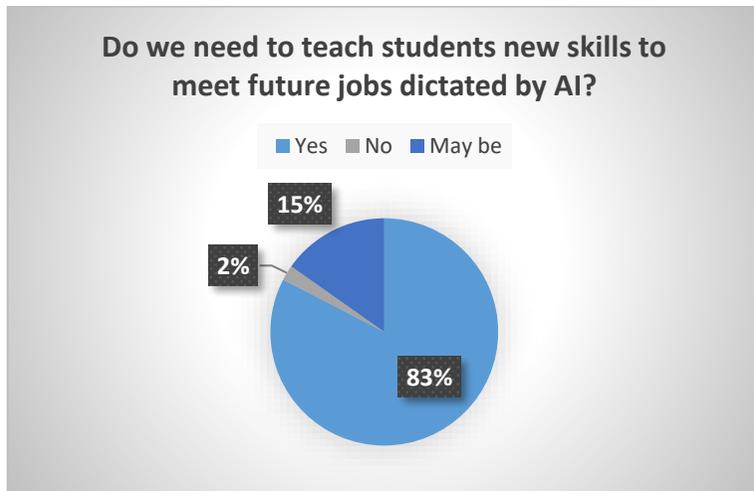


Figure 6. Teaching new skills to meet the requirements of AI

Correspondingly, 21 participants preferred to be interviewed by human rather than robots, of 71 liked robot interviewers, as explained by the following figure.

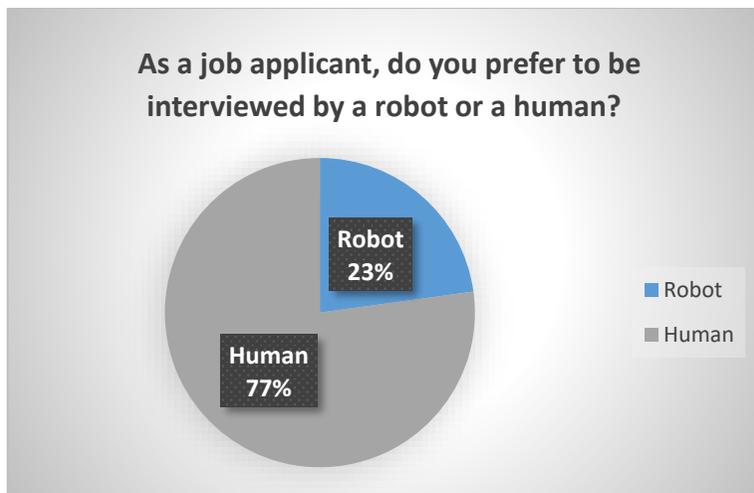


Figure 7. Prefers to be interviewed by a robot or a human.

The results reveal that 50 participants think shortlisting should be done manually compared to 42 who believe it should be AI.



Figure 8. Candidate shortlisting manual or via AI

5.4 Cognitive and ethical impacts of higher education on AI

Concerning the impact of higher education on AI from the ethical and cognitive levels, 45 participants think higher education impacts the ethical, cognitive, and human sides. Overall, humanity comes second with 19 votes, cognitive ability with 17 votes, and ethics with 11 votes.

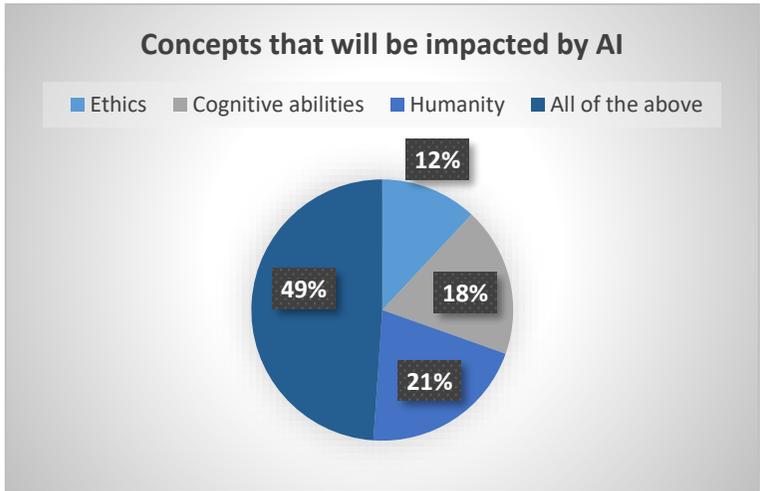


Figure 9. Cognitive and ethical impacts of higher education on AI

Similarly, vis-à-vis the robotisation of academic staff, the majority did not accept replacing academic staff with robots in higher education, as 27 strongly disagreed, and 22 disagreed. Whereas 7 strongly agreed, 20 agreed, and 16 were neutral.

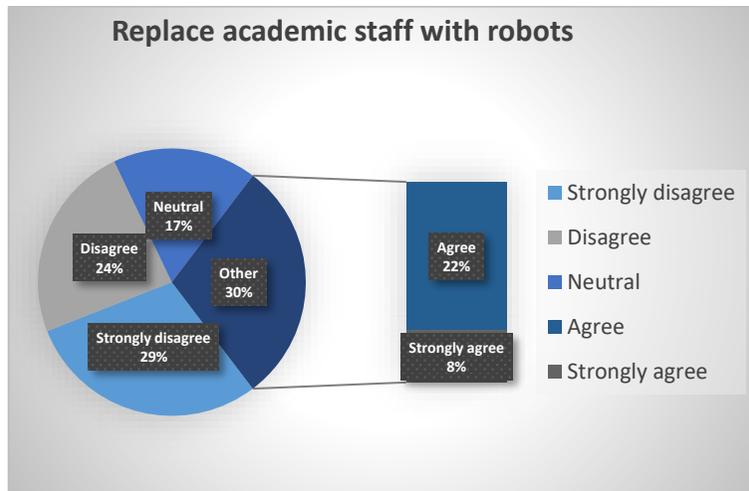


Figure 10. Replaces academic staff with robots

6. Discussion

6.1 AI impact on the learning and teaching process

The impact of AI on higher education is made clear as 79% of the participants think “Yes” compared to 19% who think “Maybe” and only 2 % who contradict the idea by saying “No”. These results support what was discussed earlier in the literature review (Rexford, 2018) in reinforcing the idea that AI will significantly impact the future of higher education (Tuomi et al., 2018). Likewise, regarding the efficiency of AI in learning and teaching, a big part of the participants believe that AI is more efficient than humans: 43 % strongly agree, and 15% agree with this idea, in contrast with 7% who strongly disagree, 10% who disagree, and 25 % are neutral. Again the results agree strongly with Brad Rose's thoughts (Brad Rose Consulting, 2019) and discussed earlier in Mahana, Johns and Apte (2012).

6.2 Impact of AI on the assessment and classification process

Similarly, regarding AI's efficiency, accuracy, and objectivity in assessing learners, results reveal that the majority agree with this point, as 25% strongly agree and 50% agree, compared to 10% strongly disagree, 4% disagree, and 1 % who are neutral. The findings agree with Brad Rose's (2019) perceptions about AI's efficiency in grading and accuracy (Brad Rose Consulting, 2019). The results agree with what Brad Rose Consulting (2019) believes and Chin (2018) believes.

6.3 AI Impact on Future Careers of Graduates

The last point concerns the impact of AI on students' future careers. The findings say that those who think it will negatively impact future careers of students are as follows: 54 % believe it will positively impact them. In comparison, 43% believe positively and negatively, and 3% think that AI will negatively impact future careers. Therefore, the findings agree again with what was discussed in the literature review by Global Business Outlook (2018) and Chin (2018). Additionally, regarding the recruitment recruitment recruitment process using AI, the the the the findings reveal that the majority of the majority of the majority of the majority of the most substantial prefer a manual

method with a percentage of 54%, compared to a minority choosing an artificially intelligent approach with a percentage of 3%, and this is an example that justifies their choice: *“I prefer to be assessed by a human because a human can understand what you mean more than a robot. For example, in exams, students can write an answer that makes sense but is not available in the book so that the robot can mark that as a wrong answer, but the human will mark it as a right answer.”*

The latter results contradict what was discussed in the literature review, as researchers think that automation will be used in interviewing and shortlisting candidates (Wang & Siau, 2017) and (Global Business Outlook, 2018). Similarly, 77% of participants prefer a human to 23 % who fancy robots being interviewed by robots or humans. This finding is not reflected deeply in Frey and Osborne's (2013 think) and is used nowadays by Vodafone and other organisations, as mentioned earlier in the literature review.

Finally, concerning the necessity to learn new skills to meet the requirements of the AI era, the the the the the findings reveal that 83% of the the the the the participants think 'Yes'. In comparison, 15% assume “Maybe”, and only 2% feel “No.” Therefore, the results agree strongly with what was discussed in the literature review that higher education institutions should prepare learners for the new world order of AI (Frey and Osborne, 2013).

6.4 Cognitive and ethical impacts of higher education on AI

Regarding the impact of higher education on AI ethically, humanly and cognitively, 49% of the participants think higher education should impact the human, cognitive and ethical aspects. However, 21% of the contributors believe in the human element compared to 18% who favour cognitive abilities as a second priority, and only 12% thought ethically. The findings reveal a significant concern with all aspects together, which is in harmony with what was raised earlier in the literature review in that AI should go hand in hand with ethics, as Chin (2018) (Chin, 2018) argues when he talked about liberal arts, humanity and AI combination. Not only Chin (2018) raised this point but also Guardian News (2017) and the example of human-robot talking about equality in the world, as well as Holmes (2018) as he focused a lot on putting ethical rules for AI.

7. Recommendations:

Based on the findings and issues raised in this research paper, the researcher recommends that applying AI in higher education is a requirement for all higher institutions. However, AI appliance suggests that academic staff should be well trained in using AI to equip learners with the required skills to face future care challenges. Similarly, the researcher recommends highlighting ethics and humanity first when teaching AI, as it threatens humankind without these values. Furthermore, privacy and dignity should be respected and protected by regulations and international laws, as AI can be used without limitations and violate human freedom. Finally, higher education institutions should control AI, make it serve and not destroy and dehumanise humankind.

8. Conclusion

This research paper investigated the impact of AI on higher education. Therefore, it stressed AI's human, ethical and cognitive impacts on the future of humanity in general and students and their future careers. Consequently, AI affects the learning and teaching process. For instance, a large part of the participants believe that AI is more efficient than

humans when it comes to learning and teaching: 43% strongly agree and 15% agree with this idea, in contrast with 7% who strongly disagree and 10% who disagree, and 25% are neutral. The latter finding goes hand in hand with the literature review findings suggested by (Chin, 2018; Ma and Siau, 2018; and Jabar and Yousif, 2011).

Similarly, regarding AI's efficiency, accuracy, and objectivity in assessing learners, results reveal that the majority agree with this point as 25% strongly agree, 50% agree compared to, 10% strongly disagree, 4% disagree, and 1% are neutral. Findings meet with the argument of (Mahana et al. 2012; Stanford University, 2019; and Brad Rose consulting 2019). Additionally, regarding the process of recruiting using AI, findings reveal that the most substantial majority prefer a manual method with a percentage of 54% as contrasted to a minority choosing an artificially intelligent approach with a percentage of 3%, and this is an example justifying their choice: "I prefer to be assessed by a human because a human can understand what you mean more than a robot. Therefore, the results agree strongly with what was discussed in the literature review that higher education institutions should prepare learners for the new world order of AI (Frey and Osborne, 2013; Oxford University, 2019). Finally, academic professionals should be well trained in artificial intelligence to provide learners with the necessary skills to handle future care concerns. When teaching AI, academics should emphasise ethics and humanity first, as AI is a threat to humanity without these ideals. Higher education institutions should also maintain control over AI, ensuring that it serves rather than dehumanises humanity.

9. References:

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