International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

INTERNATIONAL JOURNAL OF MODERN EDUCATION (IJMOE)
www.ijmoe.com

GLOBAL ACADEMIC EXCELLENCE

"NAVIGATING THE NEW EDUCATIONAL FRONTIER: UNDERSTANDING THE IMPACT OF AI TECHNOLOGIES AMONG PRE-UNIVERSITY STUDENTS"

Pratiba Narayanasamy[1*], Wan Suriatty Mazlan[2*], Mustafa Kamal Ariffin[3]

[1] Department of Monash University Foundation Year, Sunway College Kuala Lumpur, Malaysia
Email: pratiban@sunway.edu.my
[2] Department of Monash University Foundation Year, Sunway College Kuala Lumpur, Malaysia
Email: wansuriatty@sunway.edu.my
[3] Department of Monash University Foundation Year, Sunway College Kuala Lumpur, Malaysia
Email: mustafak@sunway.edu.my
[*] Corresponding Author

Article Info:

Article history:
Received date: 24.06.2024
Revised date: 04.07.2022
Accepted date: 08.08.2024
Published date: 15.09.2024

To cite this document:

Narayanasamy, P., Mazlan, W. S., & Ariffin, M. K. (2024). "Navigating the New Educational Frontier: Understanding the Impact of AI Technologies Among Pre-University Students". *International Journal of Modern Education, 6* (22), 127-139.

DOI: 10.35631/IJMOE.622010

Abstract:

In this era of drastic technological advancements, most of the students and teachers are experiencing the usage of artificial intelligence technologies in classrooms. Artificial intelligence (AI), sometimes called machine intelligence or virtual artificial agent are intelligence demonstrated by machines. These technologies that are used, sometimes are in contrast to the natural intelligence displayed by humans. In University, it is helping the students in getting additional tutoring support when they could not attend a class due to medical or any other personal reasons. These are also technologies that helps students by giving appropriate feedback with regards to their performance before submitting their assessments or group work task. Some varsities are even using AI technologies even to the extent of having human robots in handling most of the sessions in a regular classroom. This study seeks to understand the usage and impact of Artificial Intelligence technologies from a student's perspective in their learning progress at Pre-University level.

Keywords:

Artificial Intelligence Technologies, Impact Of AI, Pre-U Students Perspective, Teaching, Learning

International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Introduction

Artificial intelligence (AI) has developed significantly, bringing about new forms and changes in many aspects of modern life (Gocen & Aydemir, 2021). The usage of AI technology is inevitable in the current educational environment, especially among students for whom it has made learning more accessible and purposeful. AI is a commonly used tool amongst students be it in completing classroom work, assignments or even preparing for examination. The use of AI can enhance learning for students by tailoring the curriculum to each individual student needs. For instance, the teacher's presentation can be translated into different languages the learner chooses via integrated AI technologies. According to Chan & Lee (2023), students especially non-native English-speaking students are able to use AI generators for writing assistance.

As the use of AI has expanded tremendously in the recent decades including in the education industry it is important to understand and explore how students perceive the use of AI in their learning in particular in a classroom-based environment. In most higher learning institutions, students come from various walks of life whereby English language may not be their first language. Thus, these students may actually find it difficult to cope with their studies as the use of English language is essential in their learning at higher learning institutions. In the past, students with weak command of the language used to rely on dictionaries and libraries to get through their learning. However, with the evolving landscape of education, the incorporation of AI has brought about a change in learning methodologies. As stated by Chu (2022), in recent years, the application of AI has grown tremendously with the technologies being developed specially for teachers and students. These AI technologies give students meaningful criticism on what they should do for a customised learning experience based on context, learning outcomes, progress, and personal profiles (Sirghi, 2024; Verdu, 2017). In addition, there are other applications such as interactive games which allows students to be more independent learners (Dever, 2020).

As such, this research explores how students perceive the use of AI technologies in enhancing their learning. It examines how students incorporate AI technologies in their classroom learning settings. In carrying out this study, it is necessary to clearly understand the students background, their familiarity with the use of AI technologies and their knowledge of the AI technologies. The research questions addressed are:

1. Does the use of AI technologies positively benefit the students in their learning?
2. Does the use of AI technologies make learning more effective compared to the traditional learning method?
3. Does the use of AI technologies provide satisfaction to students in their learning journey?

The first part of the paper introduces the use of AI amongst learners. The paper's second part covers the literature review on artificial intelligence (AI) and then the methodology which describes data collection. This is followed by the findings and discussions. The last section of the paper summarizes the conclusion, limitations of the study and future research direction.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Literature Review

AI Application in Education

AI has become more significantly integrated in the industry of education. The field of using AI tools in teaching and learning beyond classroom has seen many exciting achievements recently. There were tremendous changes of innovation which also give impact to human interaction with the world around them. There were many factors that will contribute to this change of how AI will reshape and impact the future generation. The pace of changes due to using advanced technologies of AI has becoming a concern in creating the future culture of robotics in everyday life across all industries. In a study conducted by Bernard Marr (2018), it is stated that a teacher's job may go through many changes. According the usage of AI in US educational system will grow by 47% from the existing level between 2017- 2021. There are several companies identified by Marr which use AI to provide digital platforms for learning, testing and feedback to students. These platforms offer help to students ranging from pre-university to college level by giving the students new challenges, in identifying the gaps in their knowledge and in redirecting them to new concepts when appropriate. AIs application could benefit the teacher and student community by creating customized curriculum according to a student's personal requirement. It can help students access classrooms even from remote locations. Embedded AI has the ability to translate the teacher's presentation into whichever language the student opts for. This highly benefits students with hearing or visual impairments. It also benefits students when they might not be able to attend school due to illness or any other reason (Marr, 2021).

Open Data And Sources

The wide usage of AI tools has created an open-source platform that allows all data to be shared across all industries. Data can be shared with multiple private and public institutions for various teaching and learning entities and areas of studies. Auto data collection or searches can be done from any remote area through AI tools such as Chat Gpt, Google, Apple and Amazon (Garg & Sharma, 2020). These also create a concern among teachers and students regarding the cybersecurity framework. Most AI technologies will perform best when they have a high volume of data from a variety of sources. As such, educators and learners must develop a well-structured and actionable strategy regarding both internal and Internal and external assessments (Venkateswaranet *al.*, 2024).

Cognitive Technologies

Rapid advances technologies might lead to disruptive changes in education technologies. The AI new technologies are to create innovative products and harness cognitive learning insights from new data sources that currently used primarily for images, voices, and unstructured text processing. These technologies will evolve to be applied in a wide variety of applications which restrict students. The brain's ability to learn is developed through decomposition and inference. The use of AI tools will change individual's behavior and activities of learning and creating innovative products. According to Grajeda *et., al* (2024), with the increased commercialization of these types of technologies, students will have access to models that are constantly teaching them without the help from educators. These would enable new product categories and engagement techniques to be used by students without supervision while responding to the shifts in underlying risks or behaviors in real time. According to Bernard Marr (2018), at present, researchers are into the path of creating virtual human guides and facilitators "who can think, act, react and interact in a natural way, responding to and using both verbal and non-verbal communication which is believed to bring tremendous changes to both educators and students in education system.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Virtual Artificial Agent

In the Education Blog of Microsoft, McNeill & Day (2022) claim in their paper "Artificial Intelligence in Classroom" that it is easily understood why many smart applications are designed and being designed to help the teaching and student community equally. Among the common applications are the Presentation Translator, Seeing AI Application, Microsoft office Lens and many more. These applications are believed to increase students' productivity and give space to educators to design a better course curriculum for the students. AI program will allow educators to have "teaching assistant" that is trained to assist discussion forums of about 40,000 postings. The virtual teaching assistant will be expected to reply to questions by analyzing the connectivity of the questions with the pre -programmed answers based on previous responses (Chen, 2024). Thompson *et., al* (2024) stated that AI can also help to support the student's interaction and interest towards understanding a subject matter. Students who are afraid of answering questions during classes sessions in front of their peers and scared of making mistakes would have a wonderful support by personalizing sessions with the virtual artificial agent rather than get humiliated in the class by their peers.

Theoretical Framework

According to Oke & Fernandes (2020), numerous theories such as the theory of planned behavior (TPB), diffusion of innovation theory (DIT) and the technology acceptance model (TAM) have been employed to comprehend people's behavior towards technology acceptance. In this research, the technology acceptance model (TAM) is used to understand the implication of the use of AI technologies on students. The primary variables of the technology acceptance model (TAM) model are its usefulness and ease of use which can greatly stimulate the use of new technology (Zhong 2021). Perceived ease of use of new technology influence students' attitudes and intentions towards using it. A new technology that has a high degree of usefulness will have a higher chance of being adopted (Zhong 2021). This study used extended TAM with other variables to understand the impact of these technologies amongst pre-university students. The figure below illustrates the technology acceptance model (TAM).

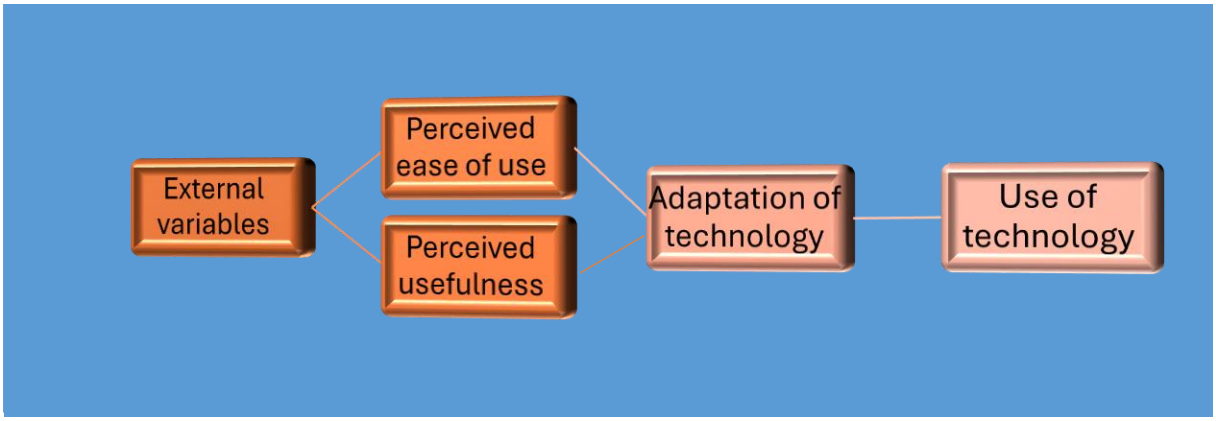

Figure 1: Technology Acceptance Model (TAM)

Based on the model above, the external variables referred to would be students learning and understanding, students' level of satisfaction from the use of these AI technologies, students' level of communication gained by using these technologies and the confidence gained in learning through the use of these tools. According to Figure 1 of TAM, the two variables classified under perceived ease of use would be students learning and understanding and the

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010
level of satisfaction obtained from the use of AI technologies. On the other hand, level of communication gained and the confidence of learning obtained can be categorised as perceived usefulness of the tools.

Methodology

The main objective of this research is to explore students' views on the use of AI technologies in their higher education. This research focuses on students enrolled in pre-university studies at a private higher learning institution in Klang Valley, Malaysia. The students come from various background consisting of International and Malaysian students who have just completed their high school. It is a requirement for students to bring their laptop or tablet to class as the policy of the pre-university programmes is to Bring Your Own Device (BYOD). This BYOD policy allows students to use their own devices which sparks innovative ideas amongst students and assist in solving classroom management issues (Çetin and Solmaz, 2020). The students consist of International and Malaysian students with different cultural background. The students are from various different pre-university programmes and from different intakes (semesters).

Since the use of AI is inevitable amongst students these days, it is necessary to gain students feedback on their perception of this technology. The research questions were designed based on the objective of understanding how students enrolled in pre-university studies felt about using these AI technologies in their learning environment. The first research question was designed to obtain feedback on the benefits of using the AI technologies in their classroom which would indicate whether the use of AI technologies has positively impacted the students learning. This led to the second research question about this technology's effectiveness compared to traditional learning methods. The purpose is to gather information on their preference to use the AI technologies. The last research question was to gather information whether students were satisfied with the use of AI in their learning.

Data Collection

The total sample size for this research was 150 students and the participants were chosen based on how well they fit the parameters of the research questions and aims. To protect the respondent’s privacy, their identity was kept confidential. In order to achieve the research objective, data was collected via google forms using a five Likert scale questionnaire ranging from “strongly agree” to “strongly disagree”. There were some open-ended questions which required students to provide some brief responses. The questionnaire was divided into part A and part B whereby part A of the questionnaire was to collect demographic characteristics of the respondents such as age, nationality and subjects enrolled. On the other hand, Part B of the questionnaire was to collect information on the use of AI technologies, their knowledge of these AI technologies and their understanding of the lesson with the use of these AI technologies.
Data was gathered through an online survey and the link for the survey was given to the respondents through their respective teachers and they were given about 10-15 minutes to complete the form. The target respondents were students enrolled in pre-university programmes in a private higher education institution in Klang Valley. The survey questionnaire covered a wide range of topics relating to AI technologies ranging from the types of AI technologies used, the respondent’s knowledge of the use of these technologies, incorporation of these technologies in their learning, the satisfaction gained in using these technologies, the usefulness and the future implication of the use of AI technologies. The table below provides sample of questions which were developed to collect information from the students.

International Journal of Modern Education
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Table 1: Sample of Questions for Data Collection

Questions	External variables	Category
The use of AI technologies has enhanced my learning and understanding	Learning	Perceive ease of use
The use of AI technologies has made me more confident in my learning	Confidence	Perceive usefulness
Learning using AI technologies gives me a sense of satisfaction	Satisfaction	Perceive ease of use
Do you think the use of AI technologies has influenced your collaboration and communication skills in group projects or discussions?	Communication	Perceive usefulness

Demographic Information

Based on the data collected, the demographic information of the respondents is presented in the table below:

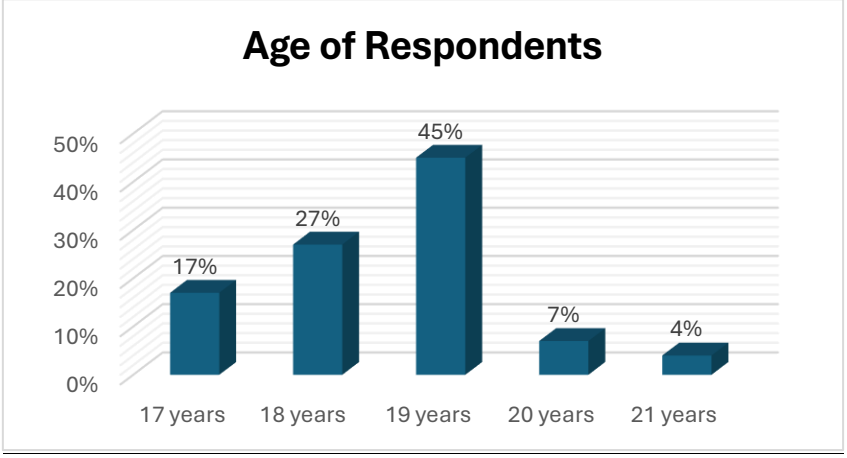

Figure 2: Respondents Age

The data collected indicated 17% of the respondents were of 17 years of age while 27% of the respondents were 18 years. A majority of the respondents (45%) were 19 years old and a small percentage which is 7% were 20 years and 4% was 21 years of age.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

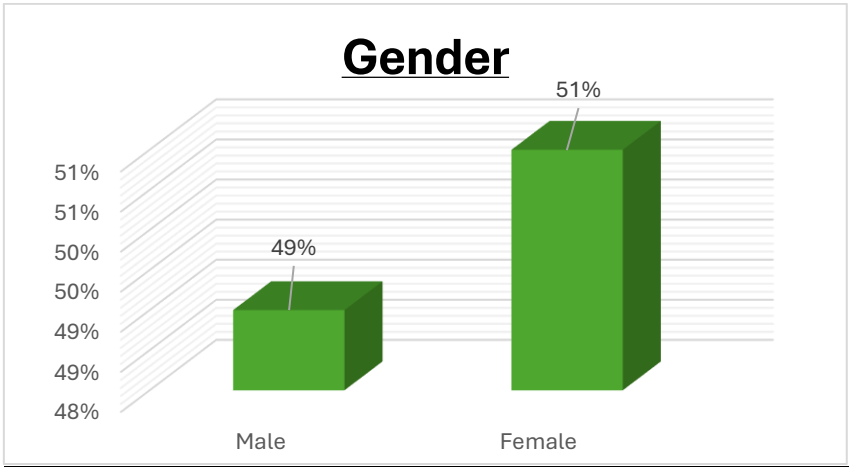

Figure 3: Respondents Gender

Based on the information obtained, 51% were female students while 49% of the respondents were males.

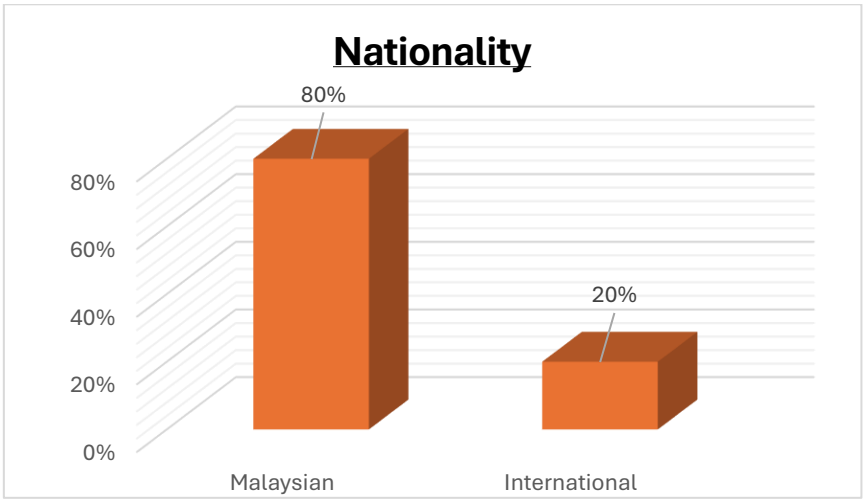

Figure 4: Respondents Nationality

The data showed that majority of the respondents were Malaysian (80%) students while 20% of the respondents were international students.

International Journal of Modern Education
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Findings

Learning

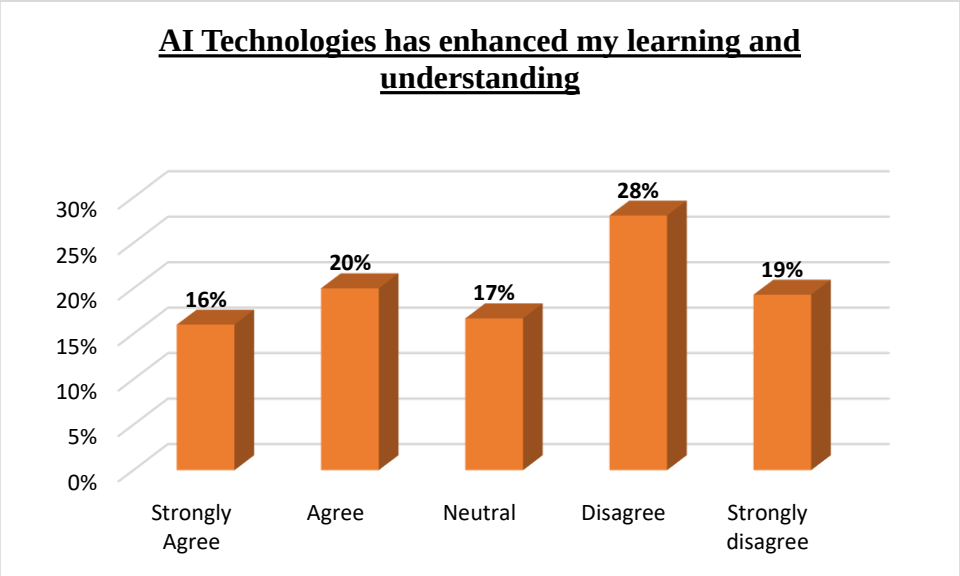

Figure 5: Respondents Learning and Understanding

From the data obtained, 16% of students strongly agree that AI technologies has enhanced their learning and understanding. Students responded that AI technologies such as Chatgpt helps them to explain any queries that they came across in their learning and understanding of certain topics or subjects. On the other hand, 28% of students disagree that AI technologies enhanced their learning and understanding. Students responded that explanations provided by AI technologies on certain topics or subjects tend to be confusing. They prefer the conventional teaching method where teacher or lecturer are to explain on technical topics or subjects which requires verbal two ways communication between a student and a tutor.

International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

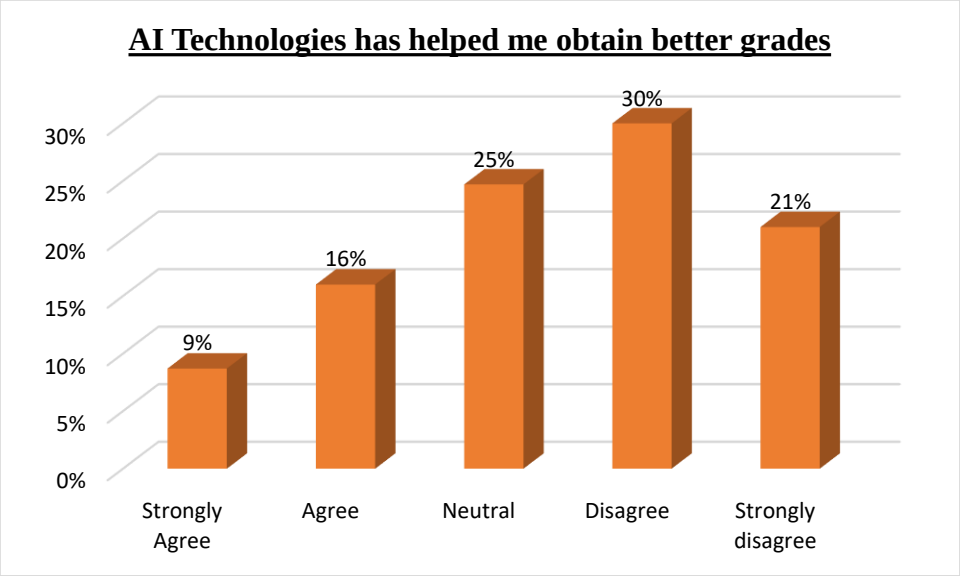

Figure 6: Respondents Enhancement of Grades

From the data obtained, 9% of students strongly agree that AI technologies has helped them to obtain better grades. This is due to students being able to get better ideas and knowledge on a given task using AI technologies to complete their assignments informatively. On the other hand, 30% of students disagree that AI technologies has helped them to obtain better grades. Students responded that using AI technologies to complete their assignments would end up with high percentage of plagiarism since they failed to rephrase ideas and knowledge thus leads to marks being deducted and low grades.

Confidence

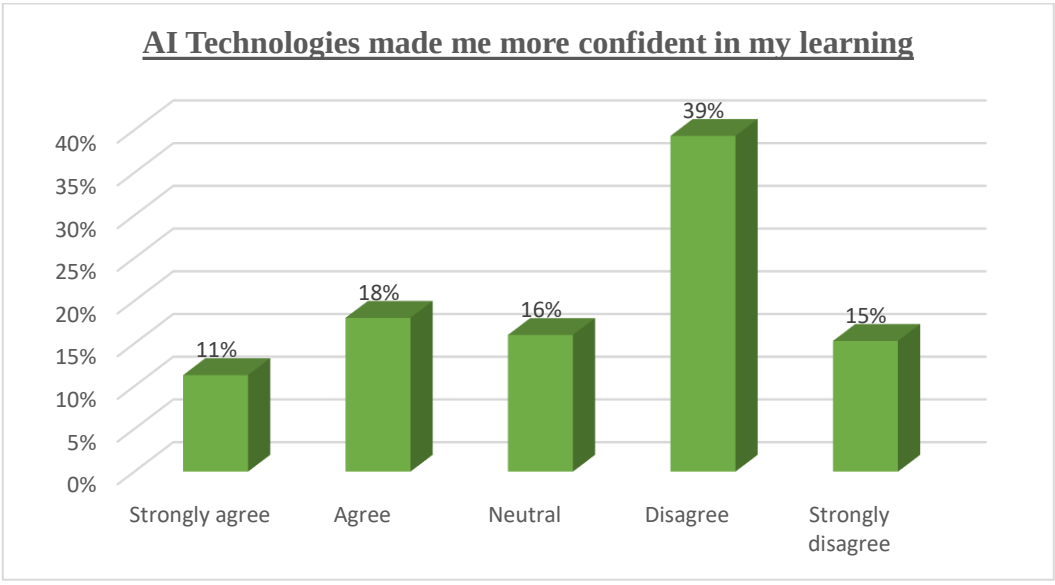

Figure 7: Respondents Confidence

From the data obtained, 11% of students strongly agree that AI technologies made them more confident in learning. Students responded that, when they use AI technologies to get

International Journal of Modern Education
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

information, they were very sure that the answers provided to them were correct and they are confident to submit the findings. On the other hand, 39% of students disagree that AI technologies enhanced their confident in learning. Students responded that, using AI technologies would limit them to brainstorm ideas. Moreover, using AI technologies decrease their confidence level when presenting information that they are not sure of the validity.

Satisfaction

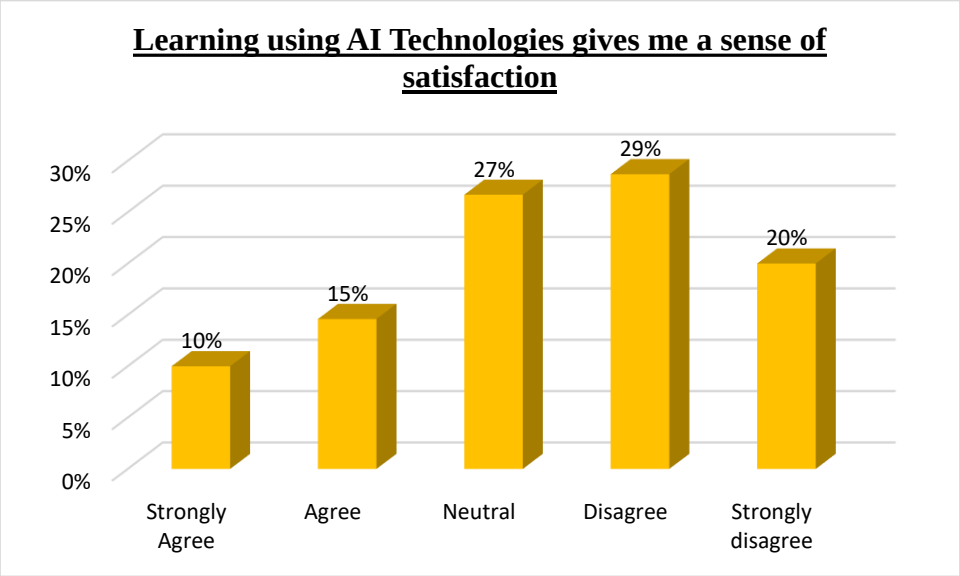

Figure 8: Respondents Satisfaction

From the data obtained, 10% of students strongly agree that AI technologies has given them the sense of satisfaction. Students responded that by using AI technologies, it gives them a chance to complete their task or assignments before the dateline and were able to fulfil most assessments requirements for certain subjects or topics. On the other hand, 29% of students disagree that AI technologies give them the sense of satisfaction. Students responded that by using AI technologies to complete task or assignments on time would not lead to them having satisfaction in completing their work even though AI technologies allow them an easy and fast way to access information.

International Journal of Modern Education
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Communication

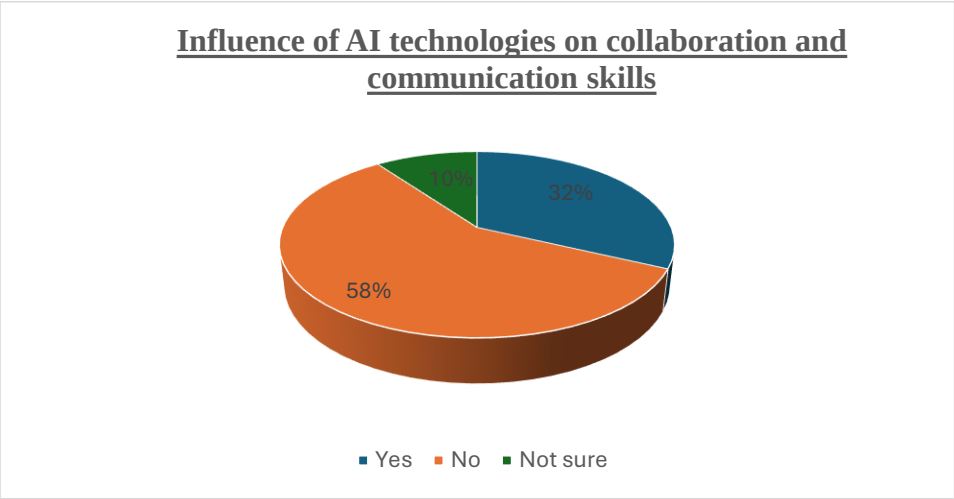

Figure 9: Respondents Communication

From the data obtained, 10% of students strongly agree that AI technologies has influenced the collaboration and communication skills. Students responded that using AI technologies helps them to provide information which can be digested and understood by everyone in the group leading to better discussion of topics. On the other hand, 58% of students do not agree that the AI technologies influence the collaboration and communication skills. Many students responded that using AI technologies give them limitation to communicate with team members for group work. This is due to all students busy finding information on their own to complete task given leading to difficulty in communication within team members.

Effectiveness of AI Technologies

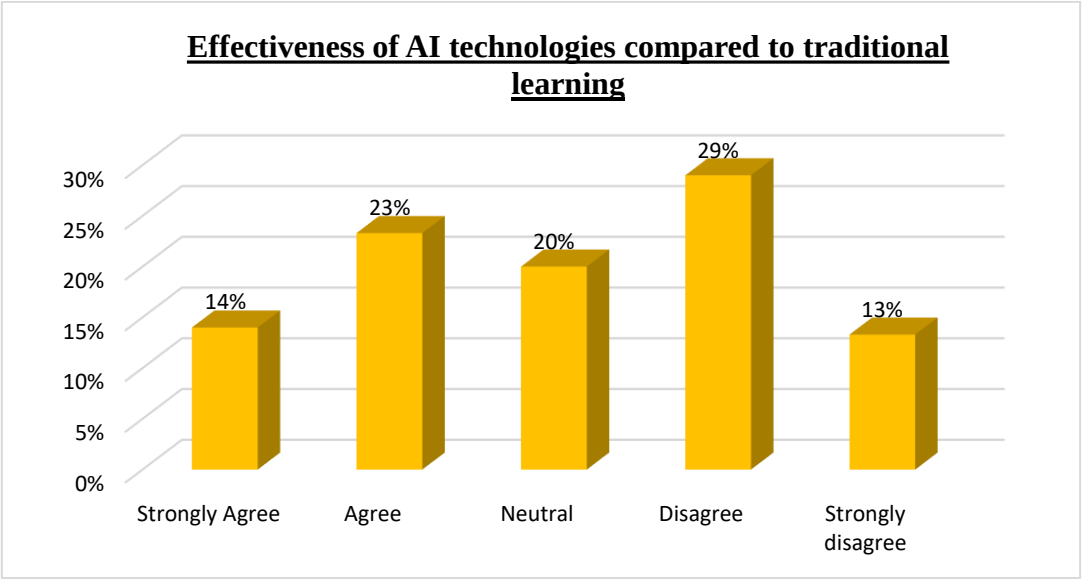

Figure 10: Respondents Effectiveness of Learning

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

From the data obtained, 14% of students strongly agree that AI technologies are more effective compared to traditional learning. Students responded that using AI technologies speed up time to complete work since it summarizes most information from many sources. On the other hand, 29% of students disagree that AI technologies were more effective compared to traditional learning. Students responded that using AI technologies has affected the students' interpersonal skills by not enhancing collaboration or communication skills within group members which leads to inefficient group discussion.

Conclusion

Overall, students found that AI technologies did not really help with their learning and understanding. This is because students felt that they were unable to rephrase and generate their own ideas. Most students preferred the conventional method which provided a two-way interaction between the teachers and students. Besides, students found that using these tools decreased their level of confidence and their ability to brainstorm ideas was also limited. In addition, majority of the students responded that the use of AI technologies did not give them the satisfaction of learning and restricted their communication during teamwork. Some students responded that during group work sessions they were more busy using the various AI tools rather than having verbal communication with their team members.

Limitations and recommendations

This study was limited to only students enrolled in pre-university studies in one of the private higher learning institutions. In addition, this study was carried out for only one semester, limiting the sample size due to time constrains. There were some respondents who were reluctant to participate in the survey as they felt that they would be judged for using AI technologies which is contributes to the limited sample size.

In the future, a cross-sectional study comparing respondents' opinions of AI technology could be conducted to undertake a more thorough investigation. The study can be expanded to include participants with varying educational backgrounds, such as undergraduates and diploma holders.

Acknowledgements

The authors would like to acknowledge and extend special gratitude to all International and Malaysian students at Monash University Foundation Year batch of 2023 for the cooperation given to this research. The authors would also like to acknowledge and extended special gratitude to Global Academic Excellence (M) Sdn Bhd, who granted the Publication Grant Scheme for this project.

References

Çetin, E. and E. Solmaz (2020). "Gamifying the Events of Instruction with Different Interactive Response Systems: The Views of Social Sciences Teacher Candidates." *Malaysian Online Journal of Educational Technology* **8**(2): 1-15.

Chan, C. K. Y., & Lee, K. K. (2023). The AI generation gap: Are Gen Z students moreinterested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and millennial generation teachers?. *Smart Learning Environments*, *10*(1), 60.

Chan, C. K. Y., & Tsi, L. H. (2023). The AI Revolution in Education: Will AI Replace or Assist Teachers in Higher Education? *arXiv preprint arXiv:2305.01185*.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 22 (September 2024) PP. 127-139
DOI: 10.35631/IJMOE.622010

Chen, H. (2024). The ethical challenges of educational artificial intelligence and coping measures: A discussion in the context of the 2024 World Digital Education Conference. *Science Insights Education Frontiers*, *20*(2), 3263-3281.

Chu, H. C., Hwang, G. H., Tu, Y. F., & Yang, K. H. (2022). Roles and research trends of artificial intelligence in higher education: A systematic review of the top 50 most-cited articles. *Australasian Journal of Educational Technology*, *38*(3), 22-42.

Dever, D. A., Azevedo, R., Cloude, E. B., & Wiedbusch, M. (2020). The impact of autonomy and types of informational text presentations in game-based environments on learning: converging multi-channel processes data and learning outcomes. *International Journal of Artificial Intelligence in Education*, *30*, 581-615.

Garg, S., & Sharma, S. (2020). Impact of artificial intelligence in special need education to promote inclusive pedagogy. *International Journal of Information and Education Technology*, *10*(7), 523-527.

Grájeda, A., Burgos, J., Córdova, P., & Sanjinés, A. (2024). Assessing student-perceived impact of using artificial intelligence tools: Construction of a synthetic index of application in higher education. *Cogent Education*, *11*(1), 2287917.

Gocen, A., & Aydemir, F. (2020). Artificial intelligence in education and schools. *Research on Education and Media*, *12*(1), 13-21.

Low, D. S., Mcneill, I., & Day, M. J. (2022). Endangered languages: A sociocognitive approach to language death, identity loss, and preservation in the age of artificial intelligence. *Sustainable Multilingualism*, *21*(1), 1-25.

Marr, B. (2018). How is AI used in education--Real world examples of today and a peek into the future? *Forbes. Retrieved July*, *25*, 2018.

Marr, B. (2018). Is Artificial Intelligence dangerous? AI risks everyone should know about. *Forbes. Retrieved May*, *13*, 2022.

Marr, B. (2021). *Data strategy: How to profit from a world of big data, analytics and artificial intelligence*. Kogan Page Publishers.

Oke, A., & Fernandes, F. A. P. (2020). Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 31.

Sîrghi, N., Voicu, M. C., Noja, G. G., & Socoliuc, O. R. (2024). Challenges of artificial intelligence on the learning process in higher education. *The Amfiteatru Economic Journal*, *26*(65), 1-53.

Thompson, N., Fleming, M., Tang, B. J., Pastwa, A. M., Borge, N., Goehring, B. C., & Das, S. (2024, March). A Model for Estimating the Economic Costs of Computer Vision Systems that use Deep Learning. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 38, No. 21, pp. 23012-23018).

Venkateswaran, P. S., Ayasrah, F. T. M., Nomula, V. K., Paramasivan, P., Anand, P., & Bogeshwaran, K. (2024). Applications of artificial intelligence tools in higher education. In *Data-Driven Decision Making for Long-Term Business Success* (pp. 124-136). IGI Global.

Verdú, E., Regueras, L. M., Gal, E., de Castro, J. P., Verdú, M. J., & Kohen-Vacs, D. (2017). Integration of an intelligent tutoring system in a course of computer network design. *Educational Technology Research and Development*, *65*, 653-677.

Zhong, Y., Oh, S., & Moon, H. C. (2021). Service transformation under industry 4.0: Investigating acceptance of facial recognition payment through an extended technology acceptance model. *Technology in Society*, *64*, 101515.