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## User Experience of AI Referencing Tools among Pre-University Students: A Study of ChatGPT and Copilot

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### ABSTRACT

The integration of artificial intelligence (AI) into the academic environment demonstrates significant changes in teaching and learning, particularly in the areas of research and referencing. This study investigates the experience of pre-university students in employing the use of AI-powered referencing tools, specifically OpenAI's ChatGPT and Microsoft's Copilot, in terms of reliability, accuracy, ease of use and satisfaction gained. The research uses the Constructivist Learning Theory, which emphasizes that students actively construct their own knowledge through their interactions with technology and educational environments. A sample of 57 pre-university students' perceptions was obtained to collect feedback on their experience in using the AI tools for the purpose of referencing to complete their assignments. The findings showed that most students found the use of these AI-powered referencing tools to assist in completing their assignments. This research is expected to provide educators and technology developers with evidence-based insights about student perspectives and enable informed decision-making about the integration of AI tools in the pre-university curriculum.

## 1. Introduction

The rapid development of artificial intelligence (AI) has transformed the educational environment across all levels, from secondary education to higher learning. Generative AI, introduced in November 2022, has garnered attention within academic communities [13]. As such, AI-powered referencing and writing assistance tools have become more accessible to students, including those at the pre-university level. Among the AI tools most widely used are ChatGPT and Microsoft Copilot, which include academic research, citation management, and content organisation [4].

Pre-university students often face challenges in completing academic work independently, particularly in areas such as research methodologies, proper citation practices, and critical thinking skills. The integration of AI referencing tools into their learning experiences enables students to complete their tasks effectively. Although these tools can improve efficiency and provide

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personalised learning support, they also raise questions about academic integrity, over-reliance on technology, and the development of research skills [2].

The use of these tools among pre-university students has not been thoroughly explored, especially in how the knowledge of their features, usability, and functional characteristics influences student experience, adoption, and satisfaction. Most literature focuses on higher education contexts [19]. This research aims to explore the user experience of AI referencing tools, particularly ChatGPT and Microsoft Copilot, among pre-university students. This study examines the perceived usability and adoption shape student satisfaction in using these tools for academic referencing, thereby contributing valuable insights for educators, technology developers, and policymakers. In conducting this study, the research questions addressed are:

1. What are pre-university students' perceptions regarding the usability and ease of use of ChatGPT and Copilot for referencing and academic writing tasks?
2. What are pre-university students' perceptions regarding the accuracy of these tools for referencing?
3. What are pre-university students' perceptions regarding the reliability of these tools to assist pre-university students with referencing?
4. How satisfied are pre-university students using these tools for referencing?

## 2. Literature Review

### 2.1 Overview

The use of Artificial Intelligence (AI) has significantly increased in the education system in universities around the world. This is particularly related to the subjects of computing, engineering, sciences, languages and information technology. The most widely used AI tools are ChatGPT and Copilot, mainly for undergraduate and postgraduate students to enhance learning activities. Research indicates that ChatGPT and Copilot are widely used nowadays to support learning concepts in classrooms, especially for assignment completion, problem solving and writing tasks [14].

Studies show that researchers and educators are rapidly investigating the implications of using ChatGPT and Copilot in the education system for its learning integrity and pedagogical value. Empirical studies in programming and computing courses have proven to help students by providing examples and explaining step-by-step guidelines for problem-solving activities such as code logic [11].

In another study analysis done on OpenAI's support in education, it is found that ChatGPT and Copilot significantly improve student performance scores and increase efficiency of task completion in classrooms [1]. This further clarifies the educational effects of using GenAI tools such as ChatGPT and Copilot in enhancing learning outcomes at universities.

Research was also done by Nathaniel *et al.*, [14] and Bistarelli *et al.*, [3] on Open AI's tools application in education that enhances students' conceptual understanding and fundamental skills. ChatGPT and Copilot tools are not only providing conversational comprehension support and explaining problems but also increasing the development of workflows in the education environment [3,4].

Scopus-based research has shown exponential increases of ChatGPT and Copilot usage within educational environments, which includes ethical considerations, pedagogical shifts and academic integrity [17]. Overall, the rapidly growing research on the use of ChatGPT and Copilot has become a signal of worldwide transformation. These trends reflect the enhancement of future generation capabilities and possibilities in the education system through real-time support that is offered by OpenAI's tools, such as ChatGPT and Copilot.

## 2.2 Theoretical Framework

This research on students' experience of AI referencing tools, such as ChatGPT and Copilot, among pre-university students is grounded in Constructivist Learning Theory. This study employs Constructivist Learning Theory to provide a comprehensive understanding of how learners interact with, perceive, and integrate these technologies into their learning. This framework accounts for both the active engagement required to construct knowledge and the cognitive constraints imposed by digital tool design.

## 2.3 Constructivist Learning Theory

Constructivist Learning Theory, as proposed by Piaget and Vygotsky, posits that learners are not passive recipients of information but rather active constructors of their own understanding through experiences and interactions with their environment [6]. This demonstrates that user experience is not only determined by objective tool features but by how students cognitively process and interpret these features within their learning contexts [18]. Two important concepts promote the idea of constructed knowledge, which is that students use their prior knowledge to develop new understanding. According to Chand [6], students have acquired substantial knowledge before starting their formal education. Using this prior knowledge or experience, students adapt what they already know through new learning opportunities. Another concept is that learning is viewed as an active rather than a passive process, whereby the learner assesses their knowledge based on their experience in the new learning environment. By doing so, learners stay engaged throughout the process by applying current understandings and modifying their knowledge [6]. Based on constructivist views, educators facilitate students in acquiring knowledge, and new knowledge is created through learners' prior experiences.

## 2.4 Conceptual Framework

The ARCS model by Keller (2016) provides a framework for examining the user's experience with AI referencing tools. The ARCS model, comprising Attention, Relevance, Confidence and Satisfaction, provides a comprehensive framework for understanding motivational factors that influence technology adoption and sustained engagement. The attention component comprises a wide range of areas of interest, boredom and relevant issues such as curiosity and excitement [12]. The ease of use is classified under the Attention category, while accuracy is grouped under the Relevance category. Students' experience with how accurate the references generated by AI tools are will be an important factor in determining the relevance of the tool to their work. This will also demonstrate whether students view the tool as dependable in completing their references, which can lead them to have the confidence to continuously use the AI tools in their studies. Confidence is the third component of the ARCS model and is essential to ensure the success of students' academic achievement. According to Hew *et al.*, [8], when students have high levels of confidence, it facilitates their learning, skills, and abilities. The final component of the ARCS model is satisfaction, which is necessary to motivate students in their learning.

## 3. Methodology

This research involves pre-university students enrolled in a higher learning institution in the Klang Valley, Malaysia. The students consist of Malaysian and International students who are in their

second semester of the programme. These students are required to use AI tools (ChatGPT and CoPilot) to aid with referencing in their assignments. The primary objective of this requirement was to train students to use AI tools responsibly, whereby they were required to declare their use and submit the output generated as an appendix. Thus, it was necessary to obtain students' feedback on their experience and satisfaction with using these AI tools.

In today's educational environment, the use of AI tools is inevitable as students are being exposed to various AI technologies. As such, the assessment was designed for students, aiming to encourage them to use the AI tools within a certain context and in a responsible manner. This is important to ensure that the academic integrity of the assessment is maintained. The research questions formulated were based on the objective of gaining insight into the user experience of pre-university students in utilising ChatGPT and CoPilot to assist with their referencing. The first research question designed was to obtain students' feedback on the usability and ease of use of these tools. This led to the second research question on the accuracy of the references generated using these AI tools.

Additionally, this question also indicated which tool was more accurate in providing the references. The next research question formulated was on the reliability of using these tools in assisting students to complete their references. Finally, it was necessary to obtain students' feedback on their level of satisfaction with using these AI tools, which led to the formulation of the fourth research question. The level of satisfaction is a motivating element that encourages students to use AI tools [10].

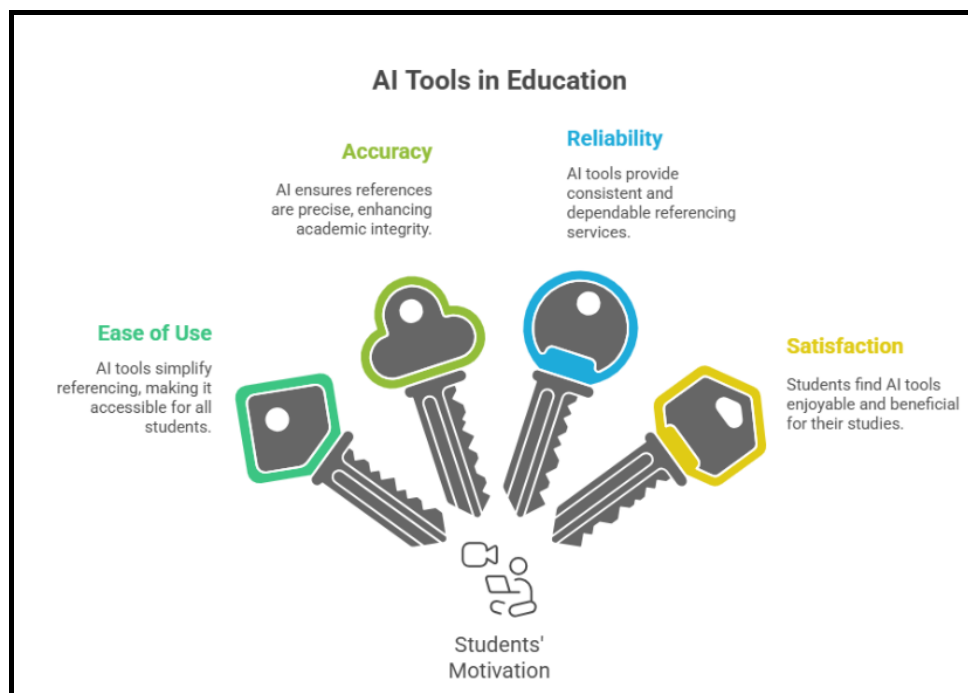


Fig. 1. ARCS students' Motivation Model

The ARCS model can be applied to this study as we examine the experience of students in utilising AI tools (ChatGPT and Copilot) to complete their referencing for assignments. The use of AI tools to assist students in their referencing has provided students with the opportunity to ensure that AI tools are used with integrity. Overall, students are satisfied with the use of AI tools for their referencing as it is enjoyable and beneficial for their studies.

#### 4. Data Collection

This research is a case study, and the total sample size consisted of 57 pre-university students. As stated by Oktadela *et al.*, [16], case studies involve gathering thorough and specific information from various sources, including observations, interviews, documentation, and other relevant materials. The students were selected based on how well they aligned with the research questions and aims. The sample of students was from a science background, undertaking Chemistry as one of the subjects. These students who were studying Chemistry were required to undertake a group project as part of their coursework. As part of their requirement for the group project, students were to use ChatGPT and Microsoft Copilot for their referencing. The student's identity was kept confidential to protect their privacy.

Data were collected using a five-point Likert scale questionnaire, which was divided into two parts, via Google Forms. Part 1 of the questionnaire consisted of the demographic information of the students, and Part 2 focused on student feedback regarding the use of AI tools. The survey link was deployed to the students during class time, and they were given 15 minutes to answer the questions. Data were analysed using descriptive quantitative analysis to investigate students' experiences with the use of the AI referencing tool. The table below presents sample questions developed to collect information from the students.

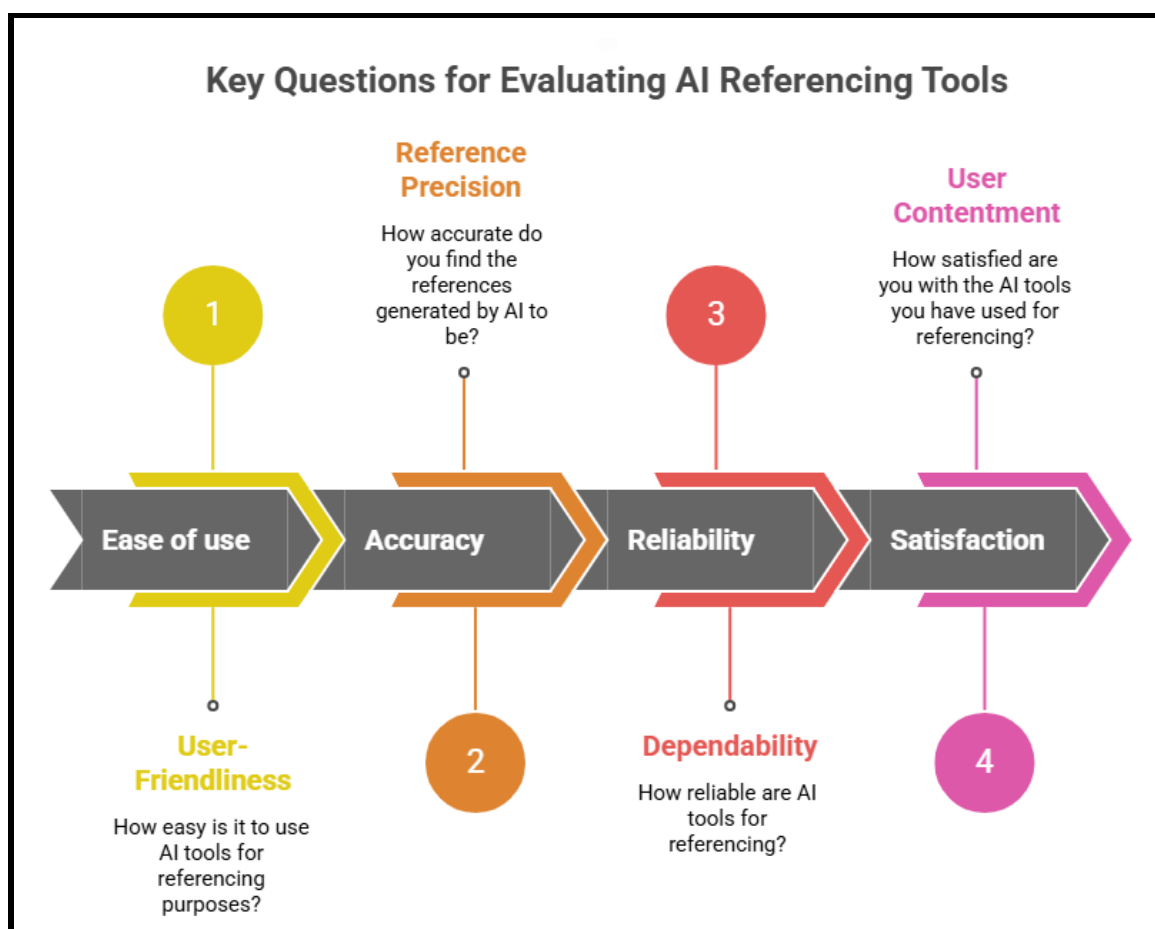


Fig. 2. Sample questions for data collection

Referring to the figure above, the survey questions were classified into four categories: ease of use, accuracy, reliability, and satisfaction.

### 5. Demographic Information

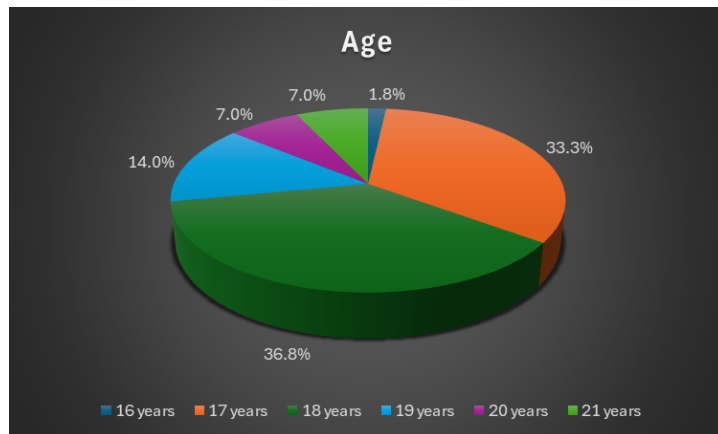


Fig. 3. Age

Based on the Figures above, 36.8% of the respondents were 18 years of age, 33.3% were 17 years of age, 1.8% were 16 years of age, 7.0% were 20 years of age, 7.0% were 21 years of age, and 14% were 19 years of age.

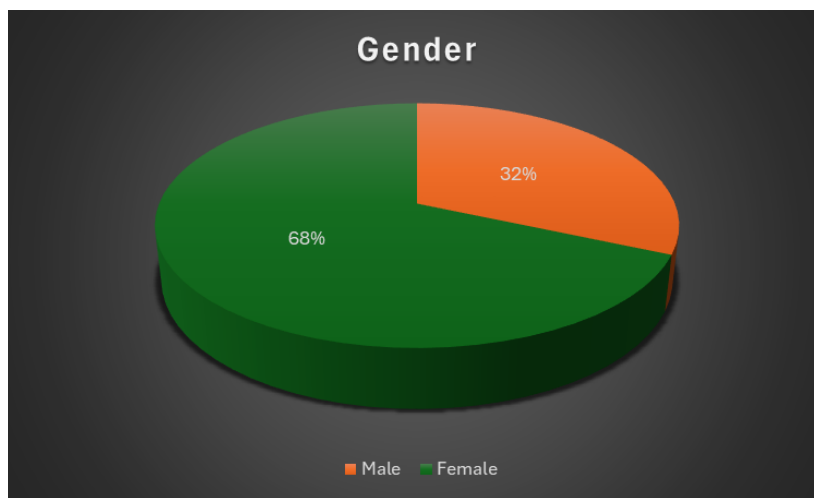


Fig. 4. Gender

From the sample of 57 respondents, 32% were Male students, while 68% Female students.

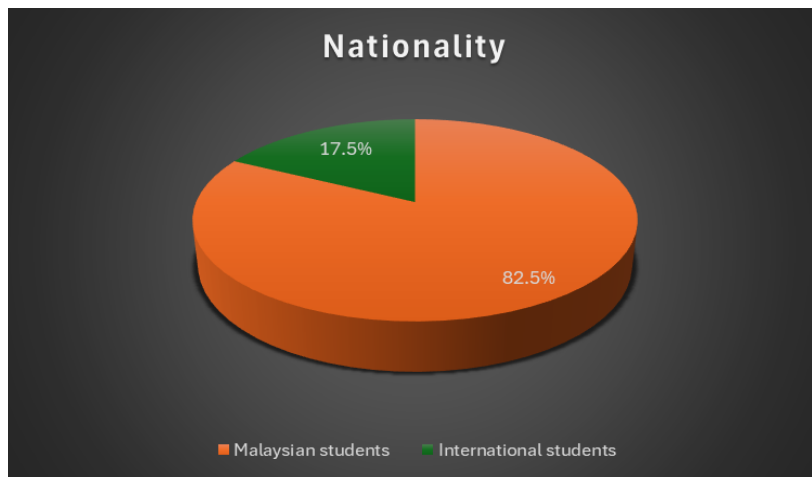


Fig. 5. Nationality

From the sample of 57 respondents, 82.5% were Malaysian students, while 17.5% were international students.

#### 4.1 Types of Tools used for Referencing

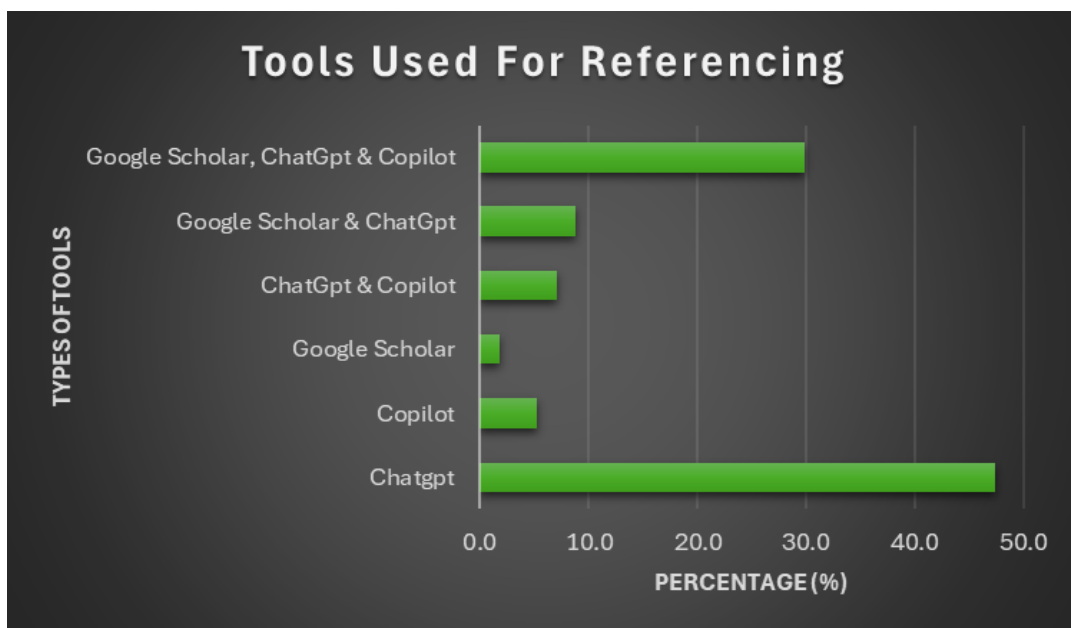


Fig. 6. Tools for referencing

It was discovered that almost 50% of students preferred ChatGPT, less than 10% selected Copilot, and 30% used a mix of Google Scholar, ChatGPT and Copilot, with the lowest percentage (1.8%) of students choosing Google Scholar.

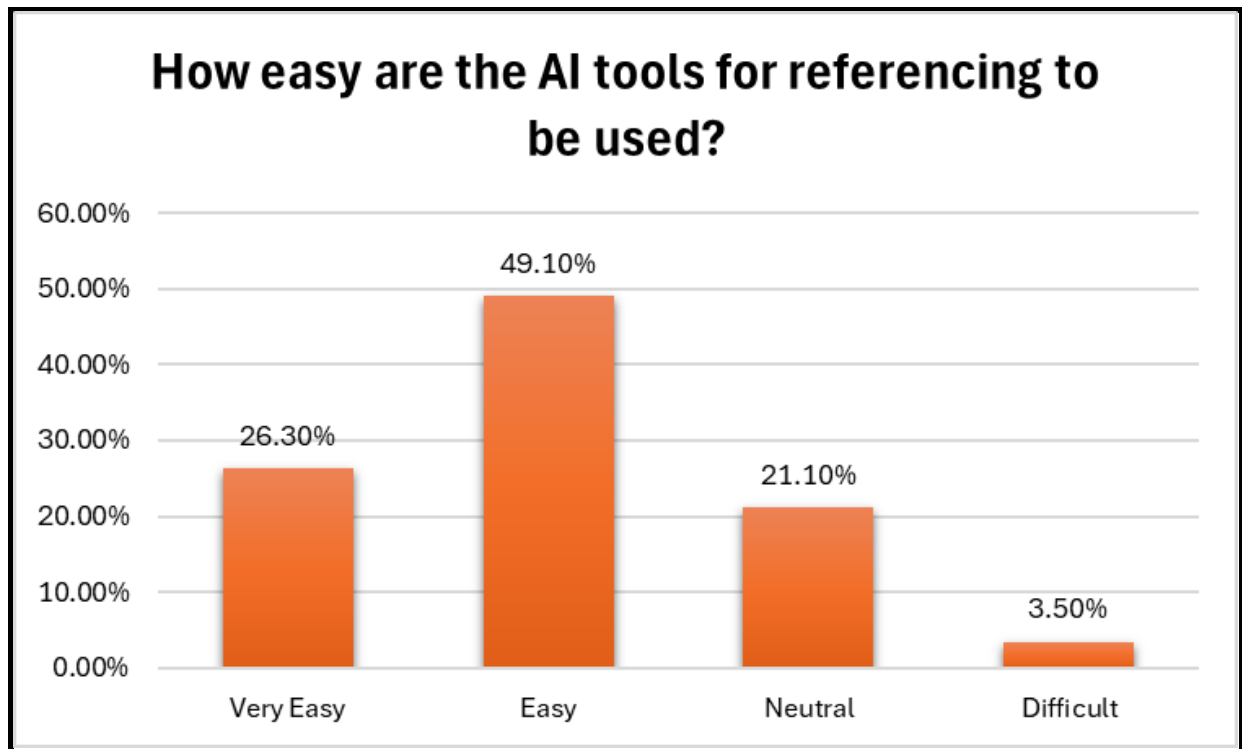


Fig. 7. Ease of use

Overall, there is an overwhelmingly positive perception of AI tools for referencing amongst students. Most students (75.4%) indicated that these tools were either easy or very easy to use. Students cited that using ChatGPT was quick and accurate. Some students mentioned that ChatGPT was most efficient and easy to access. This aligns with recent research demonstrating positive opinions toward AI-powered tools in academic contexts [1].

Only a small percentage of students (3.5%) found the AI tool difficult to use. It is also important to note that there were no students who found the tools very difficult to use. This suggests that even if students initially struggle, they are not completely unable to access it. The data demonstrates a stronger user acceptance and significantly lower barriers to adoption for AI referencing tools, which aligns with research emphasising the need for user-friendly interfaces in promoting AI adoption in the educational environment [5].

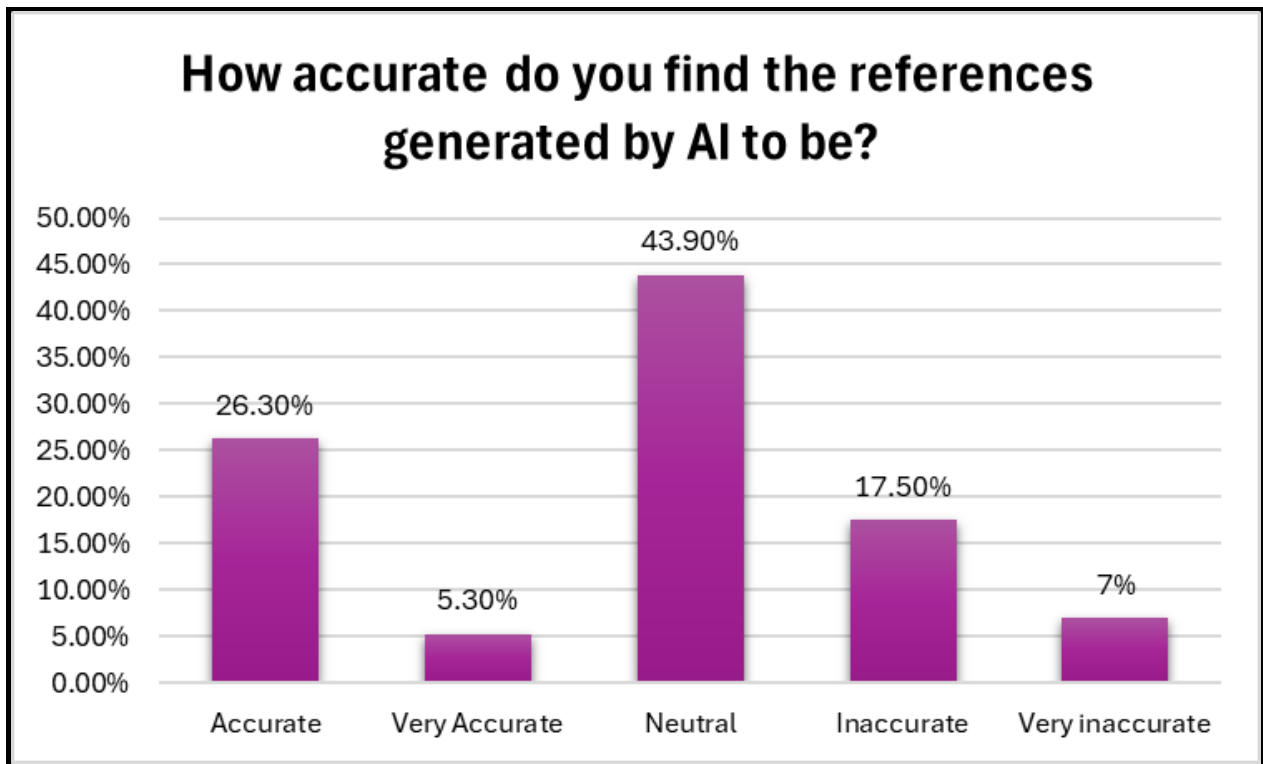


Fig. 8. Accuracy

Based on the data collected, although students found the AI tools easy to use, there was significantly more uncertainty about the accuracy of AI-generated references. This can be seen in that most of the students (43.9%) remained neutral, which could suggest inconsistent experiences in reference accuracy. The uncertainty about the referencing tool emphasises the need for transparent guidelines on the use of AI tools and the importance of verifying AI-generated content with reliable sources [15]. Only 31.6% of the students found AI tools for referencing purposes to be “accurate” or “very accurate”. On the other hand, about 24.5% of students found the tools to be “inaccurate” or “very inaccurate”. According to Demirel [7], students struggle with verifying AI-generated responses and are unable to determine if the sources are cited correctly.

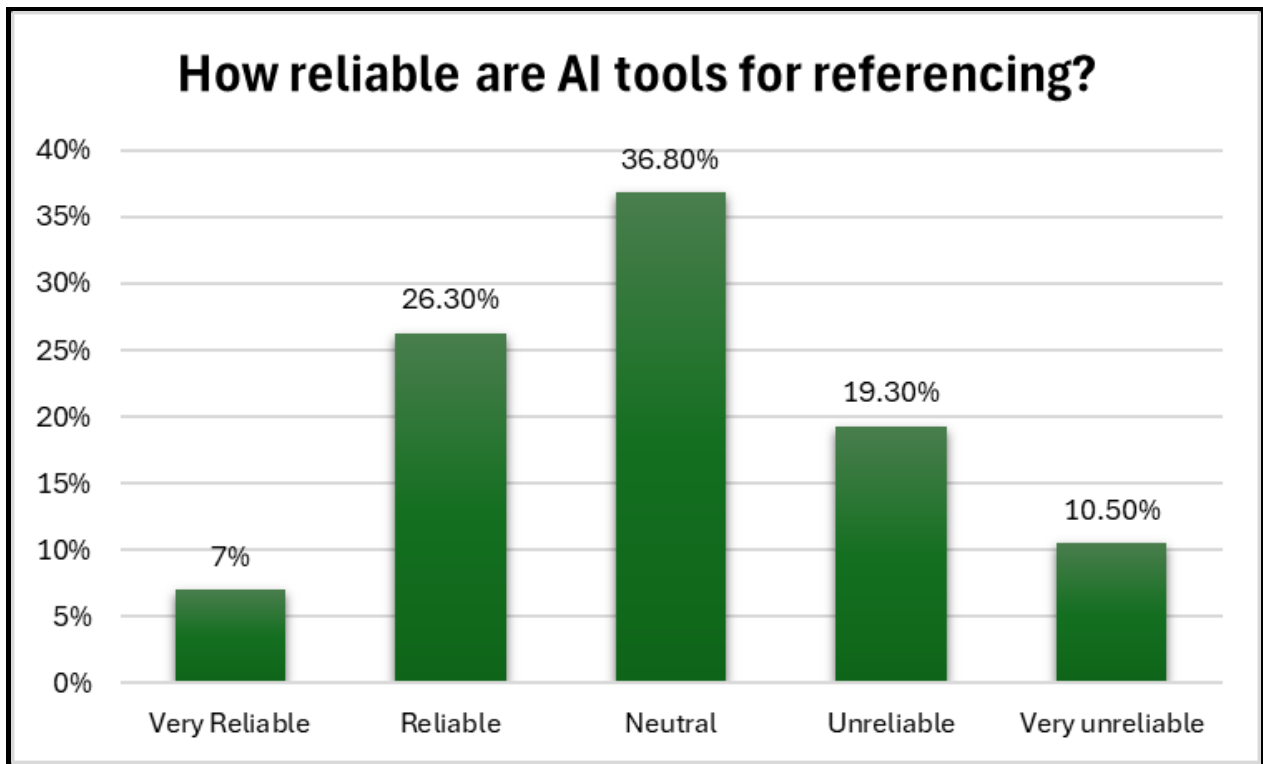


Fig. 9. Reliability

Referring to the data collected, there is significant uncertainty regarding the reliability of AI referencing tools. The research shows that 36.8% of the students remained neutral, reflecting their uncertainty about whether these tools are reliable. As such, this raises concerns about the dependability of AI-generated references in educational settings. Only 33.3% of students found the AI referencing tools “reliable” and “very reliable”. As stated by Ngo [15], the most worrying matters for students are the inability to access the quality and reliability of sources generated by AI systems. It is noted that 29.8% found the tools to be “unreliable” and “very unreliable”. This aligns with studies highlighting the challenges relating to incorrect or fake information produced by AI tools [13].

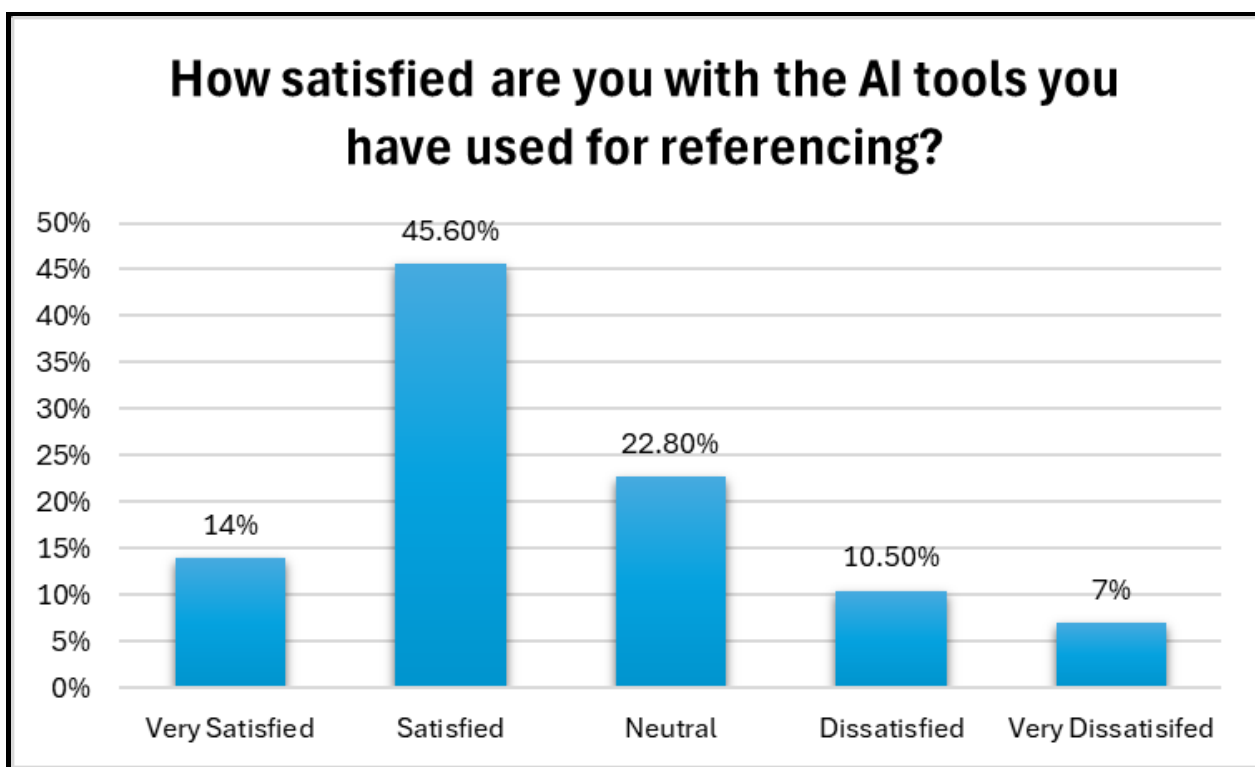


Fig. 10. Satisfaction

In terms of satisfaction, the data reveal a positive perception (59.6%) of using AI tools for referencing among students, with 14.0% very satisfied and 45.6% satisfied. This aligns with research demonstrating that university students have a favourable opinion about AI tools in the academic environment [15]. While 22.8% of the students remained neutral on the use of AI tools for referencing, 17.5% of students were “dissatisfied” and “very dissatisfied”.

## 6. Demographic Information

The findings reveal that user experiences concerning AI referencing tools in a learning environment are complicated and usually contradictory. The figures indicate a high degree of user acceptance and a low level of resistance to adoption, as a majority of 75.4% of respondents agreed that the tools were easy to use. This clearly indicates that utilisation of AI referencing tools has attained a level of usability sufficient for most users, which agrees with findings that highlight the significance of user-friendly interfaces in facilitating AI adoption in the educational context [9]. The low accessibility challenge scores indicate that AI referencing tools have effectively managed the problem of availability, thus allowing users from different backgrounds and levels of technical knowledge to use them.

Nevertheless, the positive response to ease of use outweighs issues about the quality and trustworthiness of AI-generated references. The significant difference between ease of use (75.4% positive) and reliability (33.3% positive) shows that AI referencing tools have become more accessible, but they have not yet been trusted. This gap implies that the interface designs of AI tools are so effective that users tend to overlook the reliability of these tools, which may lead to users trusting and overusing unreliable outputs [9]. Additionally, as few as 31.6% of students agreed that AI-generated references were accurate, while most (43.9%) remained neutral about the accuracy of the tool, indicating a mixed experience. Ngo [15] emphasised the importance of checking AI-generated content against trusted sources. The significant number of students who choose to remain

neutral for both accuracy (43.9%) and reliability (36.8%) reveals that most users are unable to evaluate their experience in using AI tools for referencing purposes.

Unexpected findings indicate the “satisfaction paradox”, which means that although people have expressed many concerns about the accuracy and reliability of AI referencing tools, satisfaction levels (59.6% positive) are even higher than that of accuracy (31.6% positive) and reliability (33.3% positive). This could mean that users are satisfied with other factors beyond accuracy and reliability, such as convenience, speed, and accessibility, among others. Research on AI tools in academic writing finds that students value AI tools for referencing as AI tools for referencing could give them fast information, give personalised feedback, and clarify ideas while writing [15]. In future, education systems will have to consider the restructuring of complex integration of AI technologies via pedagogical, governance and operational aspects to help stakeholders comprehend the potential and the limitations of AI [5].

## **7. Conclusion**

As a conclusion, although AI referencing tools have gained user acceptance and generated perceived value, ongoing development should emphatically focus on enhancing accuracy and reliability. This will bring important quality attributes aligned with the already established user-friendliness and user satisfaction. AI referencing tools have been quite successful in gaining user acceptance and providing value in the eyes of the users. Hence, further development to enhance accuracy and reliability should be emphasised so that these crucial quality aspects can be brought into line with the already existing level of ease of use and user satisfaction.

This research is beyond measuring simple adoption rates to reflect the disconnection between usability, trust and satisfaction. The main impact is the demonstration that high user acceptance (75.4% positive for ease of use) and moderate satisfaction (59.6%) are not reliable indicators of the tool quality, as they contradict greatly with low user confidence in accuracy (31.6%) and reliability (33.3%). The “satisfaction paradox” demonstrates that convenience without critical thinking might become a problem. Therefore, it is necessary to carry out educational programs that focus on training students to see AI as an assisting "tool" rather than a finalised "source" of information to be accepted.

This study analyses the experience of pre-university students in utilising AI tools, particularly ChatGPT and Copilot, as a referencing tool. The research provides a context-specific framework for Malaysian higher education institutions on the use of AI tools in educational settings. Additionally, it provides educators, administrators, and technology developers with evidence-based insights into students' views, helping them make informed choices about integrating AI tools into pre-university education. The resulting recommendations will lead to improvements in teaching practices and institutional policies.

## **8. Limitations and Recommendations**

The limitations of this study where the research was restricted to semester 2 students who were enrolled in the pre-university programme. Additionally, the study focused on one pre-university programme and was conducted for one semester. For future research, a more in-depth study could be carried out by expanding the research to other pre-university programmes.

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