

---

## Artificial Intelligence Tools in Higher Education Students Usage Analysis – Case Study: Sampoerna University

Noorfi Azizah Rahim<sup>1</sup>, Az Zahra Azizah Hanum<sup>2</sup>, Muhammad Agni Catur Bhakti<sup>3</sup>,  
Wandy Wandy<sup>4</sup>

<sup>1,4</sup>Information Systems, Faculty of Engineering and Technology, Sampoerna University

<sup>2</sup>Industrial Engineering, Faculty of Engineering and Technology, Sampoerna University

<sup>3</sup>Computer Science, Faculty of Engineering and Technology, Sampoerna University

Email: [noorfi.rahim@my.sampoernauniversity.ac.id](mailto:noorfi.rahim@my.sampoernauniversity.ac.id)<sup>1</sup>, [az.hanum@my.sampoernauniversity.ac.id](mailto:az.hanum@my.sampoernauniversity.ac.id)<sup>2</sup>,  
[muhhammad.bhakti@sampoernauniversity.ac.id](mailto:muhhammad.bhakti@sampoernauniversity.ac.id)<sup>3</sup>, [wandy.wandy@sampoernauniversity.ac.id](mailto:wandy.wandy@sampoernauniversity.ac.id)<sup>4</sup>

---

### ABSTRACT

*The potential application of AI in education has become an area captivating the younger generation. Among higher education students, AI tools support academic activities by providing students with personalized learning experiences that digitize each student's needs and abilities. This research aims to determine the adoption of AI tools in academic areas, specifically at Sampoerna University. This research contributes to the socialization of the use of AI tools to support academics in a good and correct way. This research used a combination of quantitative and qualitative surveys as primary data. Results show that using AI tools has become common among Sampoerna University students and has gained importance in supporting their academic needs. 50% of respondents used the AI tools in less than six months, and the most used AI tool was for grammar checking. Tablet device was the least used by the students to use the AI tools, with only 6.09%.*

**Keywords:** artificial intelligence, higher education, tools, usage analysis.

### INTISARI

Potensi penerapan Kecerdasan Buatan (AI) dalam pendidikan telah menjadi bidang yang menarik perhatian generasi muda. Di kalangan mahasiswa, perangkat AI mendukung aktivitas akademik dengan memberikan pengalaman belajar terpersonalisasi yang mendigitalkan kebutuhan dan kemampuan setiap mahasiswa. Penelitian ini bertujuan untuk mengetahui adopsi perangkat AI di bidang akademik, khususnya di Sampoerna University. Penelitian ini berkontribusi pada sosialisasi penggunaan alat AI untuk mendukung akademisi dengan baik dan benar. Penelitian ini menggunakan kombinasi survei kuantitatif dan kualitatif sebagai data primer. Hasil penelitian menunjukkan bahwa pemanfaatan perangkat AI sudah menjadi hal yang lumrah di kalangan mahasiswa Universitas Sampoerna dan semakin penting dalam mendukung kebutuhan akademis. Terdapat 50% responden menggunakan perangkat AI dalam waktu kurang dari 6 bulan, dan alat AI yang paling banyak digunakan adalah untuk pemeriksaan tata bahasa. Perangkat tablet merupakan perangkat paling sedikit digunakan mahasiswa dalam menggunakan AI dengan hanya 6,09%.

**Kata kunci:** analisis penggunaan, kecerdasan buatan, pendidikan tinggi, perangkat.

---

### INTRODUCTION

Artificial Intelligence (AI) generally refers to a set of computer programs and technologies that simulate the intelligence and function of the human brain (Jaiswal & Arun, 2021). AI applications are increasingly prominent and have gained much attention over the past few years. The most recent McKinsey Global Survey article affirms the massive growth of generative AI technologies. Less than a year after several of these technologies launched, AI has gone from a topic reserved for tech employees to a focus on company leaders (*The State of AI in 2023: Generative AI's Breakout Year* | McKinsey, 2023).

AI has brought a new era of innovation and revolution in various fields, including education. The development of AI may have the most significant impact on educational institutions that are expected to keep adjusting to digitalization and incorporating the newest technological skills into their curricula. The potential application of AI in education has become an area that is captivating the younger generation, and this case means the school has no other choice but to provide space for them (Karsenti, 2019).

In recent years, various tools have emerged that change users' lives by providing convenience in AI. Among higher education students, these AI tools support academic activities by providing students with personalized learning experiences that digitize each student's needs and abilities

(Priyahita, 2020). This personalized and adaptive learning experience helps students better understand and grasp complex concepts. For instance, in higher education, students are expected to produce academic writing. Students typically require academic papers, such as essays, research papers, and critical reviews, which require writing skills. However, these writing skills are "difficult to acquire" (Syahnaz & Fithriani, 2023). Students should achieve communicative goals in academic writing by having the ability to problem-solving and strategy application. Therefore, Writers frequently seek out tools and resources to help them improve their writing, ensuring it is clear, concise, and error-free. One of the most used grammar-checking tools in education is Grammarly, which can improve users' writing abilities if used regularly (Arisandi & Sudarajat, 2023).

Besides grammar error-free, students must also paraphrase their writing to lessen plagiarism when they cite someone else's work. Many students struggle with rephrasing their academic writing, and failure to paraphrase appropriately will result in plagiarism accusations. Implementation of sophisticated technology, such as AI in paraphrasing, is needed to address this issue. Students can improve their paraphrasing skills by using online paraphrasing tools. Online paraphrasing tools can help with various tasks, including plagiarism detection and rewriting text. One of the paraphrasing tools most widely used by writers is Quillbot (Syahnaz & Fithriani, 2023).

Using online grammar checkers and paraphrase tools can help writers detect passive sentence writing, change passive sentences to active sentences, find errors in article usage, provide suggestions for using verb alignment correctly, and provide plagiarism detection features in writing. In terms of writing, AI assists students by quickly fixing frequent grammar errors and improving their confidence in writing (Novianti, 2020). Implementing artificial intelligence is beneficial for students who must write in English by utilizing grammar-checking and paraphrasing tools to assist their writing process.

In addition, other AI tools like Chatbots have also attracted students' attention recently. Chatbot development can enhance learning, communication, and productivity while providing practical teaching assistance and reducing ambiguity (Sandu & Gide, 2019). The systems can handle many questions about subjects and placements (Dehankar et al., 2022). With full internet access, this tool allows students to create content by composing essay paragraphs, discussions, questions, and even programming code (Boschee, 2023). In other words, Chat AI serves as a Virtual Assistant (VA) to provide quick, comprehensive information to students (Dehankar et al., 2022).

In addition to writing grammatically and well-spelled, AI also offers benefits for students who have difficulty expressing their thoughts and ideas without the constraints of spelling and handwriting taking notes accurately and independently. Class notes are an essential thing for students' understanding. For some students with difficulty, particularly non-native English speakers and students with disabilities, speech recognition tools are available to help students face that difficulty (Ranchal et al., 2013).

Over the past few years, there have been significant improvements in image creation and processing. Research shows that using AI-generated images for educational purposes is common because most resultant images are satisfied and align with the text input (Aktay, 2022). With the potential for further development of AI tools, more benefits are gained to enhance student's learning experience in higher education.

Nonetheless, since AI Tools have become increasingly common, academics must be aware of the possibility of people exploiting this technology irresponsibly and adopting AI ethically, especially in the academic area (DuBose & Marshall, 2023). The research examines the existence of mixed perceptions among teachers regarding the benefits of AI technology for students, which shows that some teachers recognize its benefits. In contrast, others are concerned about the impact of AI technology on academic integrity (Mohammadkarimi, 2023). Thus, it is critical to emphasize ethical concerns and provide guidelines for the appropriate application of AI in education.

This research aims to determine the proper guidelines for AI tool adoption in academic areas, specifically at Sampoerna University. This research contributes to the socialization of AI tools to support academics properly and ethically.

## RESEARCH METHODOLOGY

This research used a combination of quantitative and qualitative surveys as primary data. The survey was carried out using a questionnaire containing a mix of open-ended and closed-ended questions, employing multiple choice and a Likert scale. This combination was used to measure responses and capture qualitative insights from respondents. Careful consideration was given to question wording to ensure clarity and neutrality to prevent bias.

As the survey was aimed at the students of Sampoerna University, the sampling method used was non-probability sampling, expressly voluntary response sampling due to its convenience, practicality, and cost-effectiveness, allowing the selection of participants who were easily accessible or willing to participate. Although this method may introduce some sampling bias, efforts have been made to ensure diversity in the sample to increase the generalization of the study.

This survey used a standard sample size formula to determine an appropriate sample size for this research. Following manual calculations as available on the (*Sample Size Calculator: Understanding Sample Sizes | SurveyMonkey, 2023*), which can be seen in Equation (1):

$$n = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)} \dots\dots\dots (1)$$

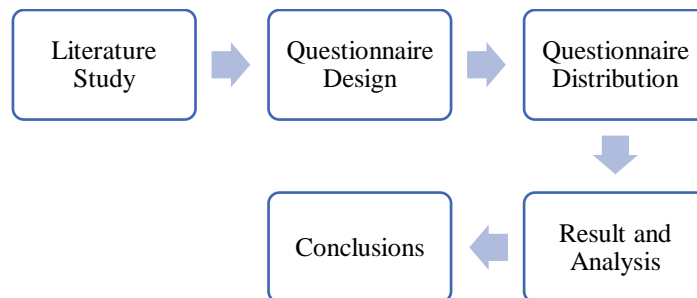
Formula description:

- n = sample size
- z = z-score
- p = standard of deviation
- e = margin of error (in decimal)
- N = population size

The population for this research was 574, with the desired confidence level of 90% to ensure high confidence in the estimates. The z-score value is 1.65 for a standard normal distribution. The margin of error was set at a maximum of 10% to ensure estimates remained reasonable and close to actual population parameters. Based on this survey's sample size estimation formula, this survey needs approximately 83 respondents.

### Research Preparations

The research flow activities are shown in the following Figure 1:



**Figure 1.** Research Flow

This research started with a literature study on using AI in higher education, focusing on Indonesia. This literature study aims to identify gaps and refine research questions. Subsequently, based on the result of the literature study, a structured questionnaire was designed, incorporating closed-ended and open-ended questions.

The questionnaire was input into a software survey form in the second week of September. The questionnaire was distributed online in the next two weeks of September, and the results were collected. Upon data collection, both quantitative and qualitative data were analyzed. The research concludes with formulated conclusions. All the details will be in the following sections.

### Literature Study

The literature study was conducted from August to September 2023. This phase used national Indonesia and international proceedings and journals from 2018-2023 through Google Scholar. The selection time frame allowed for including the most recent advancements and trends in AI integration within higher education.

### Questionnaire Design

Primary data was gathered using Microsoft Forms, which the institution subscribes to for academic purposes. The survey consisted of 7 instruments, six multiple-choice and one instrument

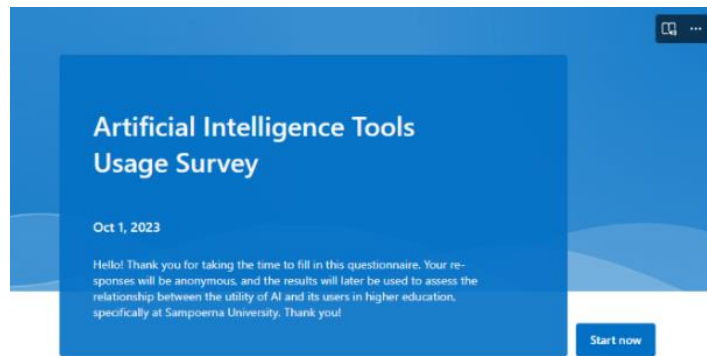
with a 5-point Likert scale format. The following Table 1 shows the instruments used in this research questionnaire:

**Table 1.** Survey Form Instruments

Question	Type	Value
What is your gender?	Option	Male, Female
What year are you in?	Option	First Year, Second year, Third year, Final Year
What is your Faculty?	Option	Faculty of Arts and Science, Faculty of Business, Faculty of Education, Faculty of Engineering and Technology
How long have you been using AI tools in your education?	Option	< 6 months, 1-2 years, 2-3 years, > 3 years
What AI tools do you use?	Option	Grammar Checking, Paraphrasing, Chat, Image Creation, Code Generator, Speech Recognition
What devices do you use for AI tools?	Option	Mobile Phone, Tablet, Desktop/Laptop
You often use AI tools.	Likert	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
AI has a positive impact on your academics.	Likert	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
AI is common among SU students.	Likert	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
You are satisfied with the AI tools you use for your academics.	Likert	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree

The first to third instruments contain the respondent's demographic information, categorizing them based on their respective cohort and field of study. The demographic details give valuable contextual information for the study. Instruments four to six highlight AI tools as one of the main focuses of the research; this shows specific AI tools Sampoerna University students use, providing insights into the tools' prevalence and relevance in their academic activities.

The final instrument used a Likert scale to attain respondents' opinions regarding the usefulness of AI tools in their academic activities to gain a comprehensive understanding of the subject. This Likert is used to identify and interpret usage patterns and user perspectives related to AI tools in higher education. The questionnaire screenshot is shown on the following Figure 2:



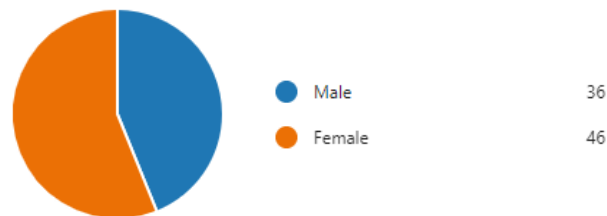
**Figure 2.** Questionnaire Screenshot

### Questionnaire Distributions

An electronically generated and published questionnaire was distributed to the students through WhatsApp, the most used chat application among respondents. The questionnaire was distributed to chat groups, and each student from a different cohort shared the questionnaire in their cohort chat group to reach the aim of survey respondents of 82 students at Sampoerna University.

Students were defined as people who had used one or more AI tools for academic purposes. They filled in the survey voluntarily. The survey was distributed from 18 September to 1 October 2023. The average time for the respondents to complete the questionnaire anonymously was around 4 minutes. As a result, 14.33% of the total respondents exceeded the target survey of 10%.

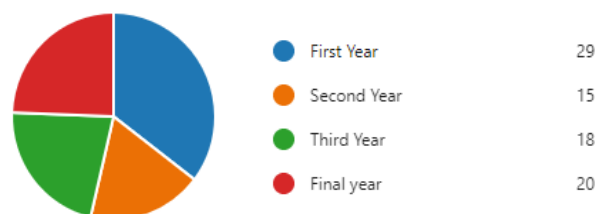
The respondents include male and female students from all cohorts in each Faculty. As given in Figure 3 shows the demographic of the respondents according to gender.



**Figure 3.** Respondent's Distribution by Gender

There were 36 male students and 46 female students who participated in this survey. The difference in respondents based on gender is slight. This result shows that the survey has reached both genders equally, which can provide potential variations in preferences between male and female students.

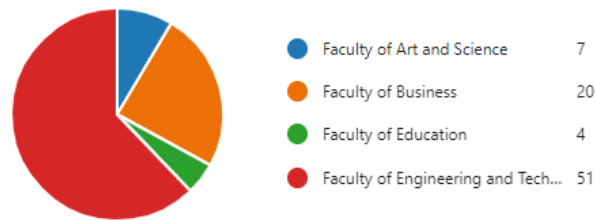
Next, about the respondents based on year, this distribution provided balanced participation information across grade levels. Figure 4 shows the distribution of respondents based on students' cohort:



**Figure 4.** Respondent's Distribution by Year

As shown in Figure 4, the questionnaire was completed by 29 (35.36%) first-year students as a majority of the respondents, followed by 15 (18.29%) second-year students, 18 (21.95%) third-year students, and 20 (24.39%) final-year students participating in this survey. This result concluded that respondents were distributed in all cohorts and represented the survey.

The last respondent's demographic information contained the student's Faculty. Figure 5 shows the distribution of respondents based on Faculty:



**Figure 5.** Respondents Distribution by Faculty

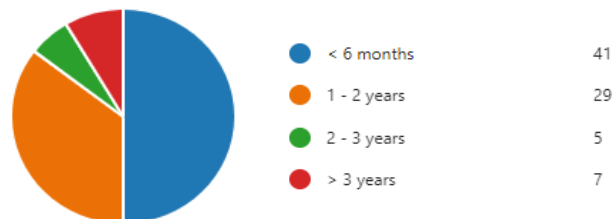
As shown in Figure 5, 51 (62.19%) students from the Faculty of Engineering and Technology were the majority of the respondents. Followed by 20 (24.39%) students from the Faculty of Business, then 7 (8.54%) students from the Faculty of Art and Science, and the last 4 (4.87%) students from the Faculty of Education. This result shows that there was diverse distribution across the Faculty, reflecting a broad range of perspectives and backgrounds among the students who participated in the survey—interpreting the survey results and drawing insights that cater to the interests and expertise of their various groups.

Information from respondents' demographics provided a diverse and reasonably widespread representation of various genders, cohorts, and faculties. This respondent demographic information influenced responses and increased the overall validity of survey results. Additionally, the results provided valuable insights into the research objectives.

## RESULTS AND ANALYSIS

The results collected from the questionnaire provide a snapshot of the student's experience with AI Tools in education. The data indicates that the respondents used various AI tools for varying periods in their education.

As in the first instrument in this section, respondents asked how long they used AI tools in their academic activities. Data shown in Figure 6 focuses on the duration of respondents engaged in AI tools.



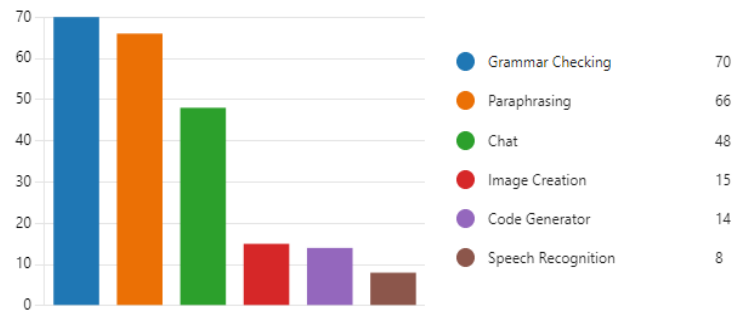
**Figure 6.** Responses to How Long Have AI Tools Used in Education

Forty-one respondents (50%) stated their engagement period in AI tools is less than six months. Their adoption of AI tools in a relatively short period indicated the possibility of new recognition or awareness of the benefits offered by AI tools in an educational context, thereby raising interest in them. Meanwhile, 29 respondents (35.36%) admitted using AI tools in 1-2 years. It indicated a higher level of familiarity due to the more extended period of use for exploring the benefits offered by AI tools.

The difference in the number of respondents using AI tools between 2-3 years and three years and above was slight. Five respondents (6.09%) who used AI tools for 2-3 years showed more engagement with using AI in their academics. Meanwhile, seven respondents (8.53%) have used it for over three years, indicating further and more profound experience.

The following instrument gives information regarding AI tools used by the respondents. A wide variety of AI tools are available for academic purposes. Figure 7 shows respondents' preferences for the AI tools used.





**Figure 7.** AI Tools Used by the Respondents

Of the six types of AI tools mentioned in the questionnaire, 70 respondents (85%) used grammar-checking tools. A large percentage indicated an excellent need for grammar-checking tools among Sampoerna University students. Significantly regarding writing skills, grammar-checking tools can improve student writing and be a real-time-saver. A study related to the use of Grammarly, one of the popular grammar-checking tools, found results that prove the benefits of Grammarly with the discovery that 82% of students passed a passing grade when Grammarly was used in descriptive teaching (Karyuatry et al., 2018). Thus, the result of the questionnaire that the majority of respondents use grammar-checking tools confirms the existence of this tool, which is valuable for higher education students.

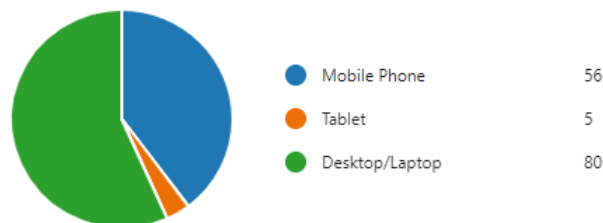
The second most-used tool was paraphrasing tools, with 66 respondents (80%). In the case of Academic Integrity, when plagiarism was restricted, paraphrasing tools provided restructured and rephrased sentences, thereby reducing the percentage of plagiarism in writing.

Chat AI tools also held a significant presence in the AI landscape, as 48 respondents (58%) used this AI tool. This result addressed that students found value in Chatbot AI and utilized it for interactive and real-time communication, where they quickly got information about their studies. It served as their VA.

Meanwhile, fewer respondents used image-creation tools for their academics. Only 15 respondents (18.29%) used this tool, indicating that only a few students used it for their creative work. Students' creative work was independent of AI tools, and there was still room to develop their creative minds.

The utilization of Code Generator had a slight gap with the image creation tool. Although this tool benefited students, only 14 respondents (17%) used it for academic activities. The small percentage indicated the possibility of low recognition of the code generator tool among students in the institution.

Lastly, with eight respondents (9.7%), the speech recognition tool was the least used AI tool. Only a few students used this tool, showing less need and role in speech recognition for academic purposes. Figure 8 shows the results of respondents' preferences regarding the devices they used for AI tools.

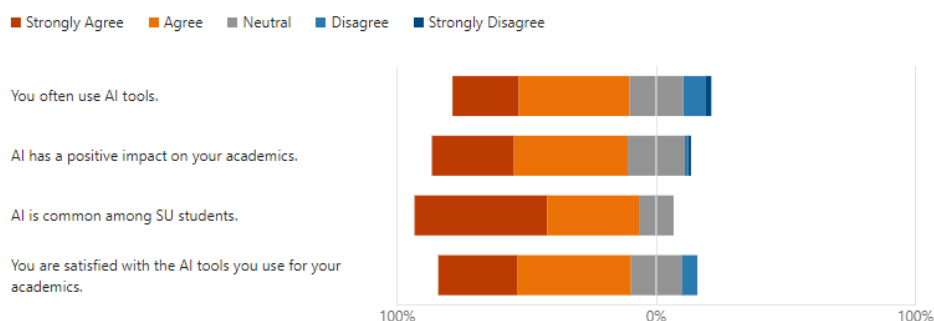


**Figure 8.** Devices Used by the Respondents

With 80 (97.56%) respondents, a laptop or desktop became the most used device to access AI tools among Sampoerna University students. Students who used laptops were in the condition when they were on static movements. They were in places where they could stay for a long time, such as classrooms and home. Followed by mobile phones, there were 56 (68.29%) numbers of respondents who used this device to connect to AI tools. This mobile phone can ease students' access to AI tools in dynamic movements. They use mobile phones in places where they can move around freely. Lastly, only 5 (6.09%) respondents used tablets for using AI tools. This device can be used

both in dynamic and static movements. However, tablets were more likely to be categorized as a luxury device. Therefore, the number of respondents who used this device was less than the other two.

The final questionnaire instrument was a Likert scale. This instrument asked respondents' opinions regarding the listed statements regarding using AI tools in higher education. The scale consists of five levels: strongly agree, agree, neutral, disagree, and strongly disagree, as shown in Figure 9.



**Figure 9.** Likert Questions

Eighty-two respondents answered four statements listed on a Likert scale instrument. As for the first statement, 25.6% of respondents strongly agreed with the frequency of using AI tools. It indicated that students were substantially engaged with the AI tools utilization in their daily lives. 42.7% of respondents agreed that they use AI often for their academic activities. There was a tendency for them to use AI tools, but not daily. As much as 20.7% of respondents stated that they were neutral, indicating that there were possibilities that they used AI tools frequently or rarely.

Additionally, 8.5% of respondents disagreed with the statement, 'You often use AI tools.' This means they did not use AI tools as often as the others who agreed and strongly agreed. They do not tend to use AI tools for their academic activities. Lastly, a small percentage, 2.4%, strongly disagreed with the statement. They indicated that there was a possibility of unfamiliarity with the AI tools. Thus, AI tools were not significantly involved in their academic activities.

The second statement resulted in 75.6% of respondents who stated that AI has positively impacted their academics. Expressly, 31.7% of respondents strongly agreed, and 43.9% agreed. An enormous number of respondents who agreed proved that AI benefits students in the context of academic activities. 22% of respondents were neutral and indicated they could not see whether the AI tools positively impacted their academic activities. Furthermore, only 1.2% of respondents disagreed and strongly disagreed respectively with the statement, indicating that these 2.4% were skeptical of the positive impacts of AI tools in their academics—a generally positive perception of AI's impact on academic activities.

The results of the third statement show that the respondents agreed that AI tools are prevalent among Sampoerna University students. Expressly, 51.2% of respondents strongly agreed, 35.4% agreed, and 13.4% were neutral. None of the respondents answered disagree nor strongly disagree, signified that students have accepted AI tools and were open to their utilization. Therefore, this AI tool has been integrated into the student community.

The final statement on the Likert scale concludes the questionnaire, asking respondents' opinions on whether AI tools are satisfactory for their academic activities. The results show that 74.6% of respondents agreed with this statement, with 43.9% agreeing and 30.5% strongly agreeing, showing that most Sampoerna University students have high approval and satisfaction with using AI. However, it is shown that 19.5% of respondents chose to be neutral, implying a level of uncertainty regarding respondents' satisfaction with the use of AI. Meanwhile, 5% of respondents disagreed with the statement and expressed dissatisfaction with AI tools.

## CONCLUSION

In conclusion, using AI tools has become common among Sampoerna University students and has gained importance in supporting their academic needs. 50% of respondents used the AI tools in less than six months, and the most used AI tool was for grammar checking. Tablet device was the least used by the students in the AI tools, with only 6.09%.



## ACKNOWLEDGMENT

This research activity collaborated with the Information Systems, Industrial Engineering, and Computer Science study programs - Faculty of Engineering and Technology, Sampoerna University. The authors were grateful for the support from the Center for Research and Community Service, Sampoerna University.

## REFERENCES

- Aktay, S. (2022). *The usability of Images Generated by Artificial Intelligence (AI) in Education*. 6(2).
- Arisandi, V., & Sudarajat, A. (2023). REVISITING "GRAMMARLY" IN HIGHER EDUCATION (A LITERATURE REVIEW). *Journal of Innovation Research and Knowledge*, 2(8), Article 8. <https://doi.org/10.53625/jirk.v2i8.5461>
- Boschee, P. (2023). Comments: AI Language Tools Hit the Books . . . and Technical Content? *Journal of Petroleum Technology*, 75(04), 8–9. <https://doi.org/10.2118/0423-0008-JPT>
- Dehankar, D. (Mrs). A., Kirpan, S., Jha, A., Thosare, G., Bhaisare, A., & Mankar, S. (2022). AI Chatbot Using Dialog Flow. *International Journal of Innovations in Engineering and Science*, 7(9), 7–11. <https://doi.org/10.46335/IJIES.2022.7.9.2>
- DuBose, J., & Marshall, D. (2023). AI in academic writing: Tool or invader. *Public Services Quarterly*, 19(2), 125–130. <https://doi.org/10.1080/15228959.2023.2185338>
- Jaiswal, A., & Arun, C. (2021). Potential of Artificial Intelligence for transformation of the education system in India. *The International Journal of Education and Development Using Information and Communication Technology*, 17, 142–158.
- Karsenti, T. (2019). Artificial intelligence in education: The urgent need to prepare teachers for tomorrow's schools. *Formation et profession*, 27(1), 105. <https://doi.org/10.18162/fp.2019.a166>
- Karyuatry, L., Rizqan, M. D., & Darayani, N. A. (2018, March). *Grammarly as a Tool to Improve Students' Writing Quality: Free Online-Proofreader across the Boundaries | Karyuatry | JSSH (Jurnal Sains Sosial dan Humaniora)*. <https://jurnalnasional.ump.ac.id/index.php/JSSH/article/view/2297/1986>
- Mohammadkarimi, E. (2023). Teachers' reflections on academic dishonesty in EFL students' writings in the era of artificial intelligence. *Journal of Applied Learning and Teaching*, 6(2), Article 2. <https://doi.org/10.37074/jalt.2023.6.2.10>
- Novianti, E. (2020, June 12). *EFL Students' Perceptions on the Use of Grammarly in Writing Thesis*. Tarbiyah dan Keguruan. <https://idr.uin-antasari.ac.id/14414/>
- Priyahita, R. (2020, January 1). *The Utilization of E-Learning and Artificial Intelligence in the Development of Education System in Indonesia*. <https://doi.org/10.2991/assehr.k.200818.061>
- Ranchal, R., Taber-Doughty, T., Guo, Y., Bain, K., Martin, H., Paul Robinson, J., & Duerstock, B. S. (2013). Using speech recognition for real-time captioning and lecture transcription in the classroom. *IEEE Transactions on Learning Technologies*, 6(4), 299–311. <https://doi.org/10.1109/TLT.2013.21>
- Sample Size Calculator: Understanding Sample Sizes | SurveyMonkey*. (2023). <https://www.surveymonkey.com/mp/sample-size-calculator/>
- Sandu, N., & Gide, E. (2019). Adoption of AI-Chatbots to Enhance Student Learning Experience in Higher Education in India. *2019 18th International Conference on Information Technology Based Higher Education and Training (ITHET)*, 1–5. <https://doi.org/10.1109/ITHET46829.2019.8937382>
- Syahnaz, M., & Fithriani, R. (2023). Utilizing Artificial Intelligence-based Paraphrasing Tool in EFL Writing Class: A Focus on Indonesian University Students' Perceptions. *Scope : Journal of English Language Teaching*, 7(2), Article 2. <https://doi.org/10.30998/scope.v7i2.14882>
- The state of AI in 2023: Generative AI's breakout year | McKinsey*. (2023). McKinsey. <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ais-breakout-year>