

Study on the Use of AI Technology in Completing Theoretical Assignments for Fashion Design Students

Siti Kholifah¹, Esin Sintawati², Agus Hery Supadmi Irianti³, Nurul Aini⁴, Hariani Aprilia⁵

^{1, 2, 3, 4, 5} Department of Culinary and Fashion Education, Universitas Negeri Malang, Indonesia

Article Info

Article history:

Received December 30, 2025

Accepted January 23, 2026

Published February 07, 2026

Keywords:

AI Technology;

Completion of Assignments;

Fashion Design Student;

Theoretical Assignments.

ABSTRACT

This study was motivated by the increasing use of Artificial Intelligence (AI) technology in learning. The development of this technology raises the question of whether the use of AI technology is more likely to have a positive impact or a predominantly negative impact. The purpose of this study is to describe the use of AI technology in competing theoretical assignments by students in the Fashion Design Education undergraduate program. This study uses a descriptive quantitative approach. This research involved a population of 173 Fashion Design Education undergraduate students from the 2023-2024 cohort, and a sample of 121 respondents was obtained through purposive sampling. The research instrument was a questionnaire that had been tested for validity and reliability. Data analysis used tabulation and frequency distribution to describe trends in AI utilization in several aspects. The results show that the use of AI technology in completing theoretical assignments ranges from moderate to very high category, indicating that AI was used quite intensively by students to support their academic activities. Thus, it can be concluded that AI technology serves as a tool used by students to support the completion of theoretical assignments.

Copyright © 2026 ETDCI.

All rights reserved.

Corresponding Author:

Esin Sintawati,

Department of Culinary and Fashion Education, Universitas Negeri Malang, Indonesia

Email: esin.sintawati.ft@um.ac.id

1. INTRODUCTION

Rapid technological developments have had an impact on various fields. Artificial Intelligence (AI) is one of the products of technological development that currently plays a significant role, especially in the education sector (Ahmad et al., 2021; Amalia et al., 2025). Artificial Intelligence (AI) is a technology that enables a system to mimic human cognitive functions, including the ability to learn, make decisions, and solve problems (Dong et al., 2020). AI began to get more attention at the end of 2022. Specifically, on November 30, 2022, OpenAI released an intuitive application called ChatGPT, which is known to use AI as the core of its operating system (Bhattacharya et al., 2024). To date, AI has become an integral part of the learning environment,

encouraging students to adapt to ever-evolving technological changes ([Murdan & Halkhoree, 2024](#)).

In higher education settings, students are often faced with various types of assignments, including theoretical tasks ([Donelan & Kear, 2024](#)). Theoretical tasks are designed to measure conceptual understanding and develop students' critical thinking skills. Examples of AI platforms include Gemini AI, ChatGPT, QuillBot, Grammarly AI, Perplexity AI, and Blackbox AI, which are increasingly being used by students to help them understand material, organize ideas, and complete theoretical assignments ([Husein et al., 2025](#); [Malik & Amjad, 2025](#)). Students' learning styles have also changed, from initially emphasizing independent exploration to now relying on AI to complete theoretical tasks such as papers, essays, and reports ([Dzogovic et al., 2024](#); [Ezzaim et al., 2025](#); [Nugroho & Trisusana, 2025](#)).

Research into the impact of AI technology in education has found varying results ([Grassini, 2023](#)). According to [Panjaitan et al. \(2024\)](#), the use of AI can speed up the completion of academic assignments, allowing students to manage their time better. [Luthfiyyah et al. \(2024\)](#) revealed that the application of AI can help students improve the quality of their work and deepen their understanding of the material, thereby potentially improving their academic performance. Research by [Salmi and Setiyanti \(2023\)](#) reveals that AI also plays a role in encouraging an increase in student motivation to learn, as it allows them to access information quickly and complete tasks more efficiently. On the other hand, research by [Amalia et al. \(2025\)](#) states that if students rely too much on AI technology, their critical thinking skills are at risk of declining because students immediately rely on AI to answer questions without going through the process of thinking independently. In addition, the widespread application of AI among students, which makes it easy to access and copy information, has the potential to increase cases of plagiarism ([King & ChatGPT, 2023](#)).

The lack of studies that specifically examine the use of AI technology in completing theoretical assignments in undergraduate fashion design education programs is an important gap in this research. Although many studies have discussed the use of AI technology in the lecture process ([Alén et al., 2025](#); [Sanders & Mukhari, 2024](#); [Zhou, 2023](#)), studies that specifically describe the level of AI utilization by students in completing theoretical assignments are still very limited. The novelty of this research lies in its specific focus on fashion design education undergraduate students, as well as the descriptive quantitative approach used to systematically describe the level of AI utilization in completing theoretical assignments. This will provide more detailed and relevant insights into the utilization of AI in the field of fashion design education, which has not been widely presented in the existing literature.

Initial observations in the Bachelor of Fashion Design Study Program at Malang State University revealed that the majority of students are familiar with and utilize AI technology for theoretical projects. Artificial intelligence is employed to paraphrase sentences, compose essays and papers, generate ideas, summarize articles, and verify grammar. Nonetheless, this application has not been complemented by a comprehensive grasp of its ramifications for the students' learning process. As of now, it is uncertain if

the application of AI technology yields mostly beneficial or detrimental effects. This issue underscores the necessity for targeted study on the application of AI technology in the execution of students' academic assignments to ensure its advantages are comprehensively grasped.

This study aims to elucidate the application of AI technology in the execution of theoretical tasks by undergraduates specializing in fashion design at Malang State University. This study aims to enhance the academic literature regarding the incorporation of AI technology in higher education. Furthermore, it is anticipated to furnish a comprehensive summary of AI application, usage intensity, reliance level, and student accountability in employing AI for theoretical projects.

2. METHOD

The research method used in this study is a quantitative approach with a descriptive quantitative research type. Descriptive quantitative is used to determine or describe the use of AI technology in completing theoretical tasks. The research steps taken were problem identification, formulation of research objectives, determination of research methods, instrument preparation, instrument testing through validity and reliability tests, data collection through questionnaire distribution, data analysis, discussion, and finally conclusion drawing. This research was conducted at the Bachelor of Fashion Design Study Program, Faculty of Engineering, State University of Malang. The subjects in this research were active students of the Bachelor of Fashion Design Study Program, class of 2023-2024, with the criterion of having used AI to complete theoretical assignments. This study used purposive sampling as its sampling technique, which yielded a sample of 121 respondents with the following calculation:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{173}{1 + 173 (0,05)^2}$$

$$n = \frac{173}{1,4325}$$

$$n = 121$$

Explanation:

n = The total samples

N = The total population

e = Maximum tolerable/margin of error (5%)

This study involved a single variable, namely the use of AI technology in completing theoretical tasks. The variable was measured using a research instrument in the form of a closed questionnaire, with a measurement scale of 1-4 based on the variable indicators. Data collection techniques using Google forms to facilitate respondent access and

ensure the efficiency of the instrument distribution process. Before being used for the main study, the instrument was tested for validity and reliability using SPSS program.

The data analysis technique used in this study was descriptive statistical analysis. The collected data were then tabulated and analyzed by calculating the frequency, percentage, and average score for each indicator. The scores for each item were grouped into interval classes to obtain the frequency for each category. The frequency results were calculated as percentages, using the following equation (Arikunto, 2021):

$$P = \frac{F}{N} \times 100\%$$

Explanation:

P = Percentage of responses

F = Frequency for which the percentage is being calculated

N = Number of respondents

Data presented in percentage form is then interpreted into descriptive statements based on specific criteria or assessment scales. The percentage range is determined using the following equation:

$$\begin{aligned} \text{Highest percentage} &= 100\% \\ \text{Lowest percentage} &= 0\% \\ \text{Percentage range} &= \frac{\text{Highest percentage} - \text{Lowest percentage}}{4} \\ &= \frac{100\% - 0\%}{4} = 25\% \end{aligned}$$

Building upon these calculations, the percentage class intervals can be interpreted and viewed in the following table:

Table 1. Percentage Class Intervals

Percentage (%)	Classification
76 – 100	Very High
51 – 75	High
26 – 50	Moderate
0 – 25	Low

3. RESULTS AND DISCUSSION

Results

This section presents the results of data analysis that has been processed based on research instruments and statistical tests. The data presented is final data that has undergone instrument testing. Instrument testing was carried out by distributing questionnaires to respondents who had the same characteristics as the population but were not included in the research sample. There were 30 respondents for the trial because the distribution of values would be closer to a normal curve. The results of the instrument trial in the validity test showed that there were 33 valid questions because the calculated r -count was $> r$ -table. Meanwhile, 3 questions were declared invalid because the calculated r -count was $< r$ -table. Then, for the reliability test, Cronbach's

Alpha was 0.925. Thus, it can be concluded that the instrument in this study is reliable and can be used for data collection because the Cronbach's Alpha value is > 0.60 .

After testing the instruments, the main study was conducted by distributing the tested questionnaires to the research sample. Then, data analysis was performed. The results of the data analysis are presented based on five indicators of AI technology utilization in completing theoretical tasks. The data were analyzed using frequency distribution to determine the distribution of low, moderate, high, and very high categories. The following are the results of the data analysis:

Table 2. Frequency Distribution of Utilization Indicators for Writing

Intervals (%)	Classification	Score Frequency	Percentage (%)
76 – 100	Very High	350	24.10
51 – 75	High	676	46.56
26 – 50	Moderate	322	22.18
0 – 25	Low	104	7.16
Total		1452	100.00

The frequency distribution results for the first indicator show that the high category has the largest percentage, namely 46.56%, followed by the very high category (24.10%), the moderate category (22.18%), and the low category (7.16%).

Table 3. Frequency Distribution of AI Usage Frequency Intensity

Intervals (%)	Classification	Score Frequency	Percentage (%)
76 – 100	Very High	168	23.14
51 – 75	High	329	45.32
26 – 50	Moderate	194	26.72
0 – 25	Low	35	4.82
Total		726	100.00

The frequency distribution results for the second indicator reveal that almost half of the respondents were in the high category (45.32%). In addition, 26.72% were in the moderate category, 23.14% were in the very high category, and only 4.82% were in the low category.

Table 4. Frequency Distribution of Efficiency and Productivity

Intervals (%)	Classification	Score Frequency	Percentage (%)
76 – 100	Very High	195	26.86
51 – 75	High	364	50.14
26 – 50	Moderate	149	20.52
0 – 25	Low	18	2.48
Total		726	100.00

According to the frequency distribution results of the third indicator above, the highest category is the largest percentage, namely 50.14%. Next is the very high category (26.86%), the moderate category (20.52%), and the low category has the smallest percentage, namely 2.48%.

Table 5. Frequency Distribution of Dependency Levels

Intervals (%)	Classification	Score Frequency	Percentage (%)
76 – 100	Very High	81	11.16
51 – 75	High	264	36.36

Intervals (%)	Classification	Score Frequency	Percentage (%)
26 – 50	Moderate	284	39.12
0 – 25	Low	97	13.36
Total		1452	100.00

The frequency distribution results for the fourth indicator show that the category with the highest percentage is the moderate category (39.12%). This is followed by the high category (36.36%), the low category (13.36%), and the very high category (11.16%).

Table 6. Frequency Distribution of User Responsibility

Intervals (%)	Classification	Score Frequency	Percentage (%)
76 – 100	Very High	183	50.41
51 – 75	High	153	42.15
26 – 50	Moderate	26	7.16
0 – 25	Low	1	0.28
Total		363	100.00

In this indicator, the frequency distribution results show that the very high category has the largest percentage, namely 50.41%, followed by the high category (42.15%), the sufficient category (7.16%), and the low category (0.28%). Overall, the research findings indicate that the use of AI technology in completing theoretical tasks by students tends to fall into moderate, high, and very high categories across all indicators studied.

Discussion

The results of the study indicate that the use of AI technology in completing theoretical assignments by students tends to fall into the categories of moderate, high, and very high on several indicators studied. In the indicator of AI utilization for writing, the high category is the dominant category (46.56%), which illustrates that undergraduate students majoring in Fashion Design at UM have utilized AI technology quite intensively in helping them complete theoretical assignments. The most widely or frequently used AI is ChatGPT/Gemini AI. These research results are in line with the findings of [Firdaus et al. \(2025\)](#), which state that students tend to utilize AI as a tool to speed up information searches and support students in completing academic assignments. The same condition was found in Fashion Design Education undergraduate students who used AI to strengthen their understanding and assist in assignment preparation. The findings in this study are also like the results of research by [Fira et al. \(2025\)](#), which shows that the use of AI can improve the quality of students' writing through grammar and writing structure corrections. The results of this study are also in line with the findings of [Amalia et al. \(2025\)](#), which states that AI-based learning technology contributes significantly to helping students understand theoretical material better.

The intensity/frequency indicator of AI usage was also dominant in the high category (45.32%), indicating that students quite often used AI technology in completing theoretical assignments. This finding is in line with research by [Putri and Andjani \(2023\)](#), which states that students tend to use AI routinely because AI can provide time efficiency and convenience in the learning process and assignment completion. Another

study by [Firdaus et al. \(2025\)](#) also shows that the frequency of AI use increases along with the increasing demands of students' academic assignments. This supports the research findings that the intensity of AI use is a common phenomenon in the context of higher education.

In terms of efficiency and productivity indicators, the highest category was the most dominant (50.14%). This finding indicates that students feel the real benefits of using AI in improving the efficiency of theoretical assignments. This finding is supported by a study by [Putri and Andjani \(2023\)](#), which states that the use of AI in education can improve learning efficiency and student academic performance. Research by [Yani \(2024\)](#) also shows that AI can increase academic productivity when used as a learning aid. Both studies confirm that AI has a positive impact if its use is directed and does not replace the active role of students in the learning process.

Furthermore, the dominant dependency level indicator is in the moderate category (39.12%), which means that students quite often rely on AI in completing theoretical tasks. Research by [Hasan et al. \(2024\)](#) shows that excessive use of AI has the potential to reduce students' critical thinking skills. Students still use their own thinking skills but are becoming accustomed to relying on AI to assist in decision-making when completing theoretical assignments. This condition is in line with the research findings, namely that the use of AI is quite intensive and influences the thinking process but has not completely replaced the intellectual role of students. The research results are also in line with the findings by [Sidhu et al. \(2016\)](#), which emphasize the importance of managing the use of technology wisely so as not to cause academic dependence.

The dominant user responsibility indicator is in the very high category (50.41%), which means that students have a very high awareness of using AI wisely and paying attention to academic ethics. This finding is supported by research by [Nisa et al. \(2025\)](#), which shows that digital ethics literacy plays an important role in preventing technology-based plagiarism, including the misuse of AI in the learning process. Thus, responsible use of AI requires students to adhere to academic ethics principles, maintain the originality of their work, and use AI wisely as a tool that supports the learning process ([Kathala et al., 2024](#); [Mhlanga, 2023](#)).

The results of this study imply that the use of AI technology in completing theoretical assignments should be understood as a learning strategy for students that evolves alongside technological advances. Theoretically, these findings reinforce the understanding that AI serves as an academic tool that supports the writing process, learning efficiency, and management of students' theoretical assignments. In practice, the results of this study can be used as a basis for study programs in designing learning processes that are adaptive to developments in digital technology. In addition, it can be used as a basis for formulating clear guidelines on the use of AI in academic environments.

4. CONCLUSION

This study provides an overview of the use of AI technology in completing theoretical assignments by undergraduate fashion design students. Based on the research

objectives, the findings show that AI has been used by students as an academic tool to support the completion of theoretical assignments, with a level of utilization ranging from moderate to very high. This utilization reflects that AI is used to support the learning process of students, especially in assisting theoretical academic activities. Based on these findings, further research is recommended to expand the study on the aspect of the influence of AI utilization on the quality of learning outcomes or academic achievement, as well as to examine in more depth effective and responsible AI utilization strategies so that they can become the basis for developing policies or guidelines for the use of AI in higher education learning.

ACKNOWLEDGEMENTS

The author would like to thank their lecturers and reviewers for providing guidance, advice, and valuable input during the research process and preparation of this article. Thanks, are also extended to the Bachelor of Fashion Design Education, Faculty of Engineering, University of Malang, for providing research support and facilities. Lastly, the author would like to express sincere gratitude to all respondents who voluntarily participated in completing the research instruments.

REFERENCES

- Ahmad, S. F., Rahmat, M. K., Mubarik, M. S., Alam, M. M., & Hyder, S. I. (2021). Artificial intelligence and its role in education. *Sustainability*, 13(22), 12902. <https://doi.org/10.3390/su132212902>
- Alén, A., Mäihäniemi, B., & Pasvenskienė, A. (2025). AI in the Lecture Room: Analysing Two Use Cases in the Context of Higher Education. In *Emotional Data Applications and Regulation of Artificial Intelligence in Society* (pp. 183-199). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-80111-2_11
- Amalia, R., Suhertina, Dahliani, & Asmayana, Y. (2025). Pengaruh Penggunaan Artificial Intelligence (AI) Terhadap Berfikir Kritis Mahasiswa. *Pediaqu : Jurnal Pendidikan Sosial Dan Humaniora*, 4(3), 4861–4866. <https://publisherqu.com/index.php/pediaqu/article/view/2359>
- Bhattacharya, P., Prasad, V. K., Verma, A., Gupta, D., Sapsomboon, A., Viriyasitavat, W., & Dhiman, G. (2024). Demystifying chatgpt: An in-depth survey of openai's robust large language models. *Archives of Computational Methods in Engineering*, 31(8), 4557-4600. <https://doi.org/10.1007/s11831-024-10115-5>
- Donelan, H., & Kear, K. (2024). Online group projects in higher education: persistent challenges and implications for practice. *Journal of computing in higher education*, 36(2), 435-468. <https://doi.org/10.1007/s12528-023-09360-7>
- Dong, Y., Hou, J., Zhang, N., & Zhang, M. (2020). Research on how human intelligence, consciousness, and cognitive computing affect the development of artificial intelligence. *Complexity*, 2020(1), 1680845. <https://doi.org/10.1155/2020/1680845>
- Dzogovic, S., Zdravkovska-Adamova, B., & Serpil, H. (2024). From Theory to Practice: A Holistic Study of the Application of Artificial Intelligence Methods and Techniques in Higher Education and Science. *Human Research in Rehabilitation*, 14(2). <http://doi.org/10.21554/hrr.092406>

- Ezzaim, A., Dahbi, A., Aqqal, A., & Haidine, A. (2025). AI-based learning style detection in adaptive learning systems: a systematic literature review. *Journal of Computers in Education*, 12(3), 731-769. <https://doi.org/10.1007/s40692-024-00328-9>
- Fira, Ilham, & Rahmaniah, R. (2025). Dampak Kecerdasan Buatan terhadap Kemampuan Menulis Mahasiswa Bahasa Inggris: Tinjauan Literature yang Sistematis. *Pendekar :Jurnal Pendidikan Berkarakter*, 8(2), 216–226. <https://doi.org/https://doi.org/10.31764/pendekar.v8i2.30444>
- Firdaus, J. A., Ummah, R. I., Apriliani, R. R., Fithriyyah, A., Mahsusi., & Faizin, A. (2025). Ketergantungan Penggunaan Kecerdasan Buatan (AI) pada Tugas Akademik Mahasiswa terhadap Kemampuan Berpikir Kritis dan Kreatif. *Jurnal Kependidikan*, 14(1), 1203–1214. <https://doi.org/10.58230/27454312.1634>
- Grassini, S. (2023). Shaping the future of education: Exploring the potential and consequences of AI and ChatGPT in educational settings. *Education sciences*, 13(7), 692. <https://doi.org/10.3390/educsci13070692>
- Hasan, S., Nasreen, S., & Shamim-ur-Rasul, S. (2024). AI Usage in Education and Mitigation of Abilities: Collaboration, Communication, Critical Thinking and Creativity among University Students. *Research Journal of Social Sciences and Economics Review*, 5(4), 20-28. [https://doi.org/10.36902/rjsser-vol5-iss4-2024\(20-28\)](https://doi.org/10.36902/rjsser-vol5-iss4-2024(20-28))
- Husein, H., Usmany, P., & Putuhena, H. (2025). Pemanfaatan Teknologi Artificial Intelligence (AI) Deepseek dan Connected Papers bagi Mahasiswa dalam Menyelesaikan Tugas Akhir. *PRAXIS: Jurnal Pengabdian Kepada Masyarakat*, 3(3), 25–31. <https://doi.org/10.47776/dkjpjy31>
- Kathala, K. C. R., Arroyo, I., & Mannuru, N. R. (2024). Role of ethical and responsible AI in education for next generation inventors. *International Conference on Artificial Intelligence in Education* (pp. 71-78). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-64312-5_9
- King, M. R., & ChatGPT. (2023). A conversation on artificial intelligence, chatbots, and plagiarism in higher education. *Cellular and molecular bioengineering*, 16(1), 1-2. <https://doi.org/10.1007/s12195-022-00754-8>
- Luthfiyyah, K., Zhaifira, L., Nurani, S., & Giwangsa, S. F. (2024). Analisis peran artificial intelligence (AI): ChatGPT dalam perkuliahan di kalangan mahasiswa PGSD Universitas Pendidikan Indonesia. *Jurnal Pendidikan Tambusai*, 8(1), 5282-5290.
- Malik, M. A., & Amjad, A. I. (2025). AI vs AI: How effective are Turnitin, ZeroGPT, GPTZero, and Writer AI in detecting text generated by ChatGPT, Perplexity, and Gemini?. *Journal of Applied Learning and Teaching*, 8(1), 91-101. <https://doi.org/10.37074/jalt.2025.8.1.9>
- Mhlanga, D. (2023). Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. In *FinTech and artificial intelligence for sustainable development: The role of smart technologies in achieving development goals* (pp. 387-409). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-37776-1_17
- Murdan, A. P., & Halkhoree, R. (2024). Integration of Artificial Intelligence for educational excellence and innovation in higher education institutions. In *2024 1st International Conference on Smart Energy Systems and Artificial Intelligence (SESAT)* (pp. 1-6). IEEE. <https://doi.org/10.1109/SESAT61023.2024.10599402>
- Nisa, A., Nurfaddlillah, F., Fahrezi, F., & Mulyana, A. (2025). Kajian Kualitatif tentang Tantangan Etika Digital dalam Dunia Pendidikan. *Jurnal Intelek Insan Cendekia*, 2(12), 18395–18405. <https://jicnusantara.com/index.php/jiic/article/view/5696>

- Nugroho, R. A., & Trisusana, A. (2025). Students' Challenges and Solutions of Using AI-based Tools for Academic Writing. *Pubmedia Jurnal Pendidikan Bahasa Inggris*, 2(2), 1–11. <https://doi.org/10.47134/jpbi.v2i2.1435>
- Panjaitan, K. L., Sinurat, J. M., Isma, Tarigan, Y., & Gustianingsih. (2024). Pengaruh ChatGPT Terhadap Pengerjaan Tugas Kuliah Pada Mahasiswa di Era Society 5.0. *Jurnal Manajemen dan Inovasi*, 5(1), 1–19. <https://ejournals.com/ojs/index.php/jmiTahun2024>
- Putri, V. A., & Andjani, K. C. (2023). Peran *Artificial Intelligence* dalam Proses Pembelajaran Mahasiswa di Universitas Negeri Surabaya. *Jurnal Prosiding Seminar Nasional*, 615–630.
- Salmi, J., & Setiyanti, A. A. (2023). Persepsi Mahasiswa Terhadap Penggunaan Chatgpt di Era Pendidikan 4.0. *Jurnal Ilmiah Wahana Pendidikan, Oktober*, 9(19), 399–406. <https://doi.org/10.5281/zenodo.8403233>
- Sanders, D. A., & Mukhari, S. S. (2024). Lecturers' perceptions of the influence of AI on a blended learning approach in a South African higher education institution. *Discover Education*, 3(1), 135. <https://doi.org/10.1007/s44217-024-00235-2>
- Sidhu, G. K., Kaur, S., & Fook, C. Y. (2016). Postgraduate students' level of dependence on supervisors in coping with academic matters and using digital tools. *Journal of Computing in Higher Education*, 28(3), 370-388. <https://doi.org/10.1007/s12528-016-9121-1>
- Yani, A. (2024). Peran Artificial Intelligence sebagai Salah Satu Faktor dalam Menentukan Kualitas Mahasiswa di Era Society 5.0. *Journal of Education Research*, 5(2), 1089–1096. <https://doi.org/10.37985/jer.v5i2.963>
- Zhou, C. (2023). Integration of modern technologies in higher education on the example of artificial intelligence use. *Education and Information Technologies*, 28(4), 3893-3910. <https://doi.org/10.1007/s10639-022-11309-9>