



Student Perceptions of the Use of Technology in Mathematics Learning

Ni Wayan Suardiati Putri^{1*}, Kadek Suryati², Evi Dwi Krisna³, Ni Kadek Ulan Cahyani⁴

^{1*,2,3,4} Institut Bisnis dan Teknologi Indonesia, Denpasar, Bali, Indonesia
suardiatiputri@instiki.ac.id

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ABSTRACT

The use of technology in mathematics learning is crucial for supporting digital learning in higher education, particularly in helping students understand abstract mathematical concepts. This study aims to determine students' perceptions of the use of technology in mathematics learning. The study used a quantitative descriptive approach with a survey method. The subjects were 130 students who had participated in technology-based mathematics learning. The instrument was a five-level Likert-scale questionnaire with six indicators: ease of use, benefits of technology, interest and motivation, interaction and engagement, obstacles to use, and support for understanding mathematical concepts. Data were analyzed using percentages. The results showed that students had positive perceptions. The dominant response was agreement for the ease of use indicator (53.54%), benefits of technology (51.69%), interest and motivation (44.15%), interaction and engagement (51.23%), and support for understanding concepts (46.00%). For the obstacles indicator, the highest response was neutral at 39.54%. Thus, technology is perceived as capable of supporting mathematics learning, although its optimization still requires the readiness of facilities, networks, and user skills.

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1. Introduction

The development of digital technology has brought about major changes in the world of education, including in mathematics learning in higher education [1]. Technology is now not only used as a tool to deliver material, but also plays a vital role in creating a more interactive, flexible, and accessible learning process [2]. In mathematics learning, the use of digital technology can help students understand abstract concepts through visualization, simulation, interactive media, and access to various digital learning resources [3].

Mathematics learning has unique characteristics because many concepts require visual representation and a step-by-step thinking process. Therefore, technology can be a tool to help students see relationships between concepts, understand problem-solving steps, and relate mathematical material to real-world situations. Research by Bruna, Allahbakhshi, and Álvarez shows that the use of digital technology in linear algebra learning contributes to an understanding of how students perceive and use technology in mathematics education, and

emphasizes the importance of technology-based learning strategies tailored to student needs [4].

Furthermore, digital literacy is also an important aspect in technology-based mathematics learning [5]. Research by [6] explains that digital literacy skills are needed in mathematics learning because technology can help improve understanding when used appropriately. The study also used a survey approach to examine students' perceptions of digital literacy in mathematics learning.

Although technology offers many opportunities in mathematics learning, its success is not solely determined by the availability of learning devices or media. The perception of students as primary users is an important factor in determining the effectiveness of technology utilization. Positive perceptions can encourage students to be more active, motivated, and open in participating in technology-based learning [7]. Research by [8] shows that most students have a positive perception of online mathematics learning using YouTube, WhatsApp Groups, and Google Classroom, and there is a relationship between student perceptions and learning outcomes.

However, the use of technology can also face various obstacles, such as the readiness of facilities, network quality, user capabilities, and the suitability of technology to learning materials. [9] emphasized that obstacles to technology integration in education are not only related to hardware, but also training, content support, technology infrastructure, and user readiness. Therefore, this study is important to determine students' perceptions of the use of technology in mathematics learning, especially based on indicators of ease of use, benefits of technology, interest and motivation, interaction and involvement, obstacles to use, and technology support for understanding mathematical concepts.

2. Method

This study used a quantitative descriptive approach with a survey method. This approach was chosen because the study aims to describe students' perceptions of the use of technology in mathematics learning based on quantitative data obtained through questionnaires. The survey method is relevant in perception research because it can provide an overview of respondents' views, attitudes, and experiences regarding a learning phenomenon [10]. A similar approach was also used in research [8,11] which examined students' perceptions of digital literacy in mathematics learning.

The research subjects were 130 students who had participated in technology-based mathematics learning. The object of the study was students' perceptions of the use of technology in mathematics learning. Data were collected using a closed-ended questionnaire with a five-level Likert scale: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. Using a Likert scale questionnaire is appropriate for measuring students' perceptions because it allows respondents to state their level of agreement with each statement.

The research instrument was compiled based on six indicators, namely ease of use of technology, benefits of technology in mathematics learning, interest and motivation to learn, student interaction and involvement, obstacles to technology use, and technology support for understanding mathematical concepts. Each indicator consists of five questions, so that the total number of questions is 30 questions. The data obtained were analyzed descriptively using percentages to determine the tendency of student answers on each indicator.

Descriptive analysis was also used in research [6] to describe students' perceptions of online mathematics learning.

3. Results and Discussions

The research results are presented based on six indicators of student perceptions of the use of technology in mathematics learning. Each indicator consists of five questions and is analyzed using percentages of student responses.

3.1 Ease of Use of Technology

In the ease of use indicator, the Agree category obtained the highest percentage at 53.54%, followed by Neutral 28.31%, Strongly Agree 16.46%, Disagree 1.23%, and Strongly Disagree 0.46%. These results indicate that the majority of students feel that the mathematics learning technology is easy to use and easy to access. Students also assessed that the display of the learning media is quite easy to understand and helps them learn more independently. Thus, the technology used has met the aspect of ease of use, thus supporting student comfort in participating in mathematics learning.

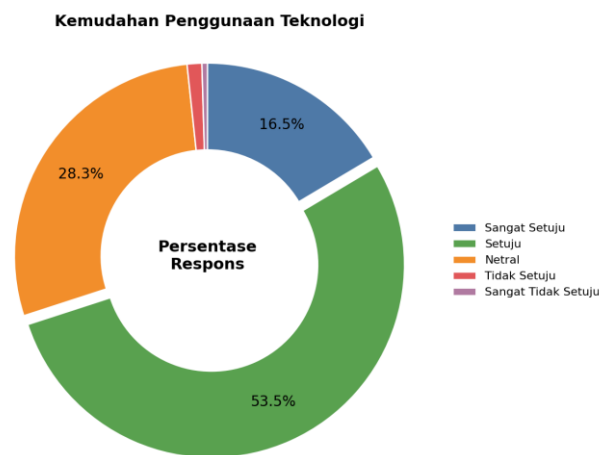


Figure 1. Pie chart of percentage of responses on ease of use of technology

3.2 Benefits of Technology in Mathematics Learning

In the indicator of the benefits of technology in mathematics learning, the Agree category obtained the highest percentage at 51.69%, followed by Neutral 24.62%, Strongly Agree 21.08%, Disagree 2.46%, and Strongly Disagree 0.15%. These results indicate that students consider technology useful in helping them understand mathematical concepts, especially through videos, simulations, and interactive media. Technology also helps students understand the steps to solve problems and connect mathematical concepts to real-life problems. Thus, technology functions not only as a medium for delivering material, but also as a visualization aid and conceptual understanding.

Manfaat Teknologi dalam Pembelajaran Matematika

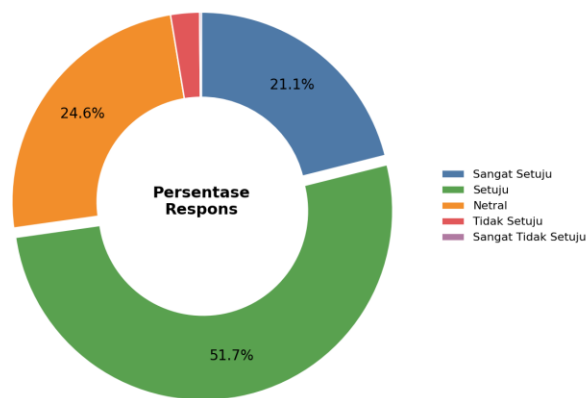


Figure 2. Pie chart of percentage of answers on the benefits of technology in mathematics learning

3.3 Interest and Motivation to Learn

In the learning interest and motivation indicator, the Agree category obtained the highest percentage of 44.15%, followed by Neutral 33.38%, Strongly Agree 18.31%, Disagree 3.54%, and Strongly Disagree 0.62%. These results indicate that the use of technology is quite capable of increasing student interest and motivation in learning mathematics. Students feel that learning becomes more interesting, enjoyable, and encourages them to be more active in doing exercises. However, the relatively high percentage of Neutral indicates that the influence of technology on motivation is not felt evenly by all students. Therefore, technology needs to be combined with more active and contextual learning strategies.

Minat dan Motivasi Belajar

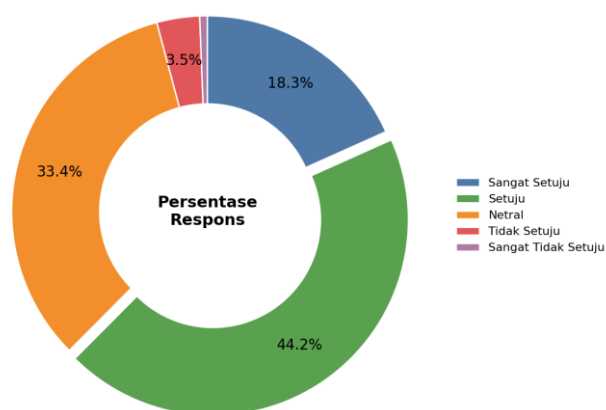


Figure 3. Pie chart of percentage of answers on interest and motivation to learn

3.4 Student Interaction and Involvement

In the student interaction and engagement indicator, the Agree category obtained the highest percentage at 51.23%, followed by Strongly Agree 25.23%, Neutral 20.92%, Strongly Disagree 1.54%, and Disagree 1.08%. These results indicate that technology helps increase

student engagement in mathematics learning. Students find it easier to discuss with lecturers and friends, are more involved in learning activities, are easier to complete assignments, and receive feedback on learning outcomes. Thus, technology supports the creation of more interactive, collaborative, and participatory learning.

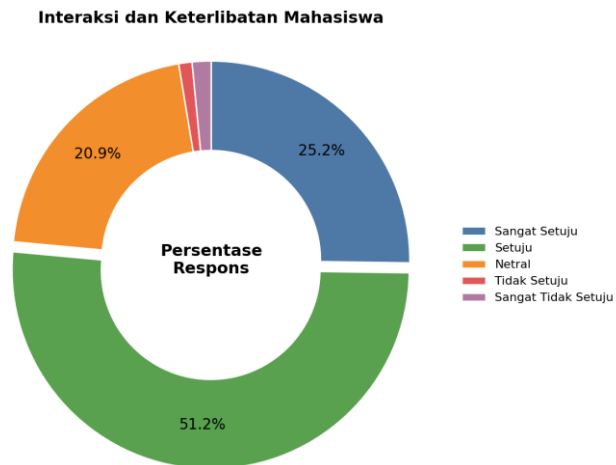


Figure 4. Pie chart of percentage of answers on student interaction and involvement

3.5 Barriers to Technology Use

In the technology use constraints indicator, the Neutral category obtained the highest percentage of 39.54%, followed by Agree 29.69%, Disagree 17.23%, Strongly Agree 9.08%, and Strongly Disagree 4.46%. In contrast to other indicators, this indicator is dominated by Neutral responses. This indicates that students' experiences with technology use constraints are quite diverse. Some students experience internet network constraints, limited devices, the need for time to adjust, impaired learning focus, and difficulty learning some mathematics materials through technology. Therefore, the use of technology needs to be supported by adequate facilities, clear usage instructions, and learning designs that are appropriate to the characteristics of the mathematics material.

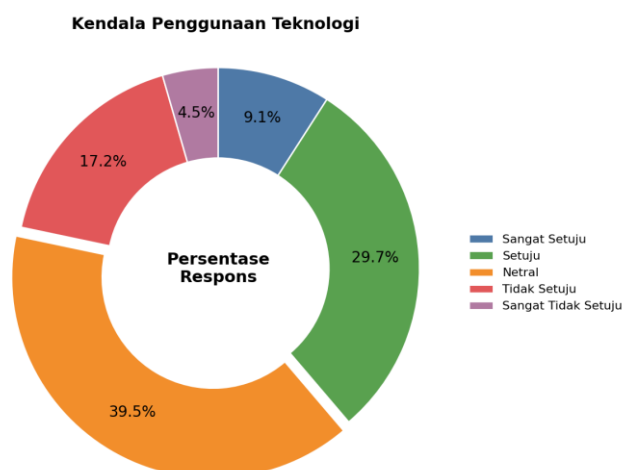


Figure 5. Pie chart of percentage of answers on obstacles to using technology

3.6 Technological Support for Understanding Mathematical Concepts

In the indicator of technology support for understanding mathematical concepts, the Agree category obtained the highest percentage of 46.00%, followed by Strongly Agree 32.00%, Neutral 19.54%, Disagree 1.85%, and Strongly Disagree 0.62%. These results indicate that students have a very positive perception of the role of technology in helping to understand mathematical concepts. Technology is considered capable of presenting abstract concepts through visualization, simulation, animation, video, and interactive media. The combination of lecturer explanations and technology is also considered to make mathematics learning more optimal. Therefore, technology needs to be continuously developed as part of mathematics learning innovation in higher education.

Dukungan Teknologi terhadap Pemahaman Konsep Matematika

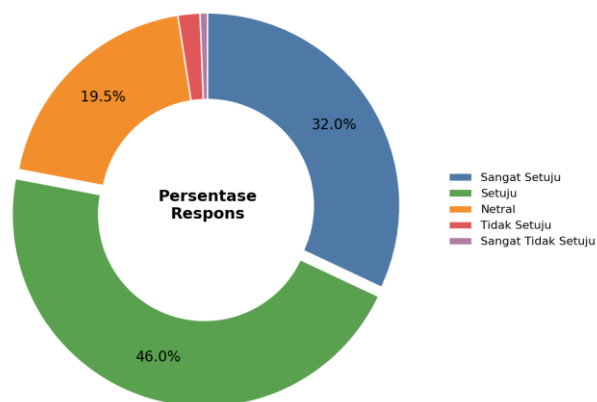


Figure 6. Pie chart of percentage of answers on technology support for understanding mathematical concepts

4. Conclusion

Based on the research results, it can be concluded that students have a positive perception of the use of technology in mathematics learning. This is indicated by the dominant response of "Agree" in most indicators, namely ease of use of technology, benefits of technology in mathematics learning, interest and motivation to learn, student interaction and involvement, and technology support for understanding mathematical concepts. Technology is considered easy to use, useful, able to increase student involvement, and support the understanding of mathematical concepts. However, in the indicator of obstacles to technology use, the Neutral category obtained the highest percentage. This indicates that there are still several obstacles that need to be considered, such as internet network, supporting devices, student readiness, and the suitability of technology to learning materials. Thus, the use of technology in mathematics learning needs to continue to be developed in a planned manner. Lecturers and educational institutions need to provide supporting facilities, select appropriate media, and design learning strategies that can optimize the use of technology to improve the quality of mathematics learning.

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References

- [1] Alya, H. (2026). *Tren Penelitian Pembelajaran Matematika Berbasis Teknologi Digital : Suatu Tinjauan Literatur Sistematis*. 1(1), 1–7.
- [2] ATABEK, O. (2019). Challenges In Integrating Technology Into Education. *Information Technologies and Applied Sciences*, 14(1), 1–19. <https://doi.org/10.7827/TurkishStudies.14810>
- [3] Baroroh, A. Z., Kusumastuti, D. A., & Kamal, R. (2024). *Pemanfaatan Teknologi dalam Pembelajaran*.
- [4] Bruna, C. E. R., Allahbakhshi, M., & Álvarez, C. V. (2025). Student Perceptions and Beliefs on the Use of Digital Technologies from an Innovation Experience in an Introductory Linear Algebra Course. *International Journal of Information and Education Technology*, 15(2), 236–245. <https://doi.org/10.18178/ijiet.2025.15.2.2237>
- [5] Herlina, S., Kusumah, Y. S., & Juandi, D. (2023). Digital Literacy: Student Perception In Mathematics Learning. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 12(3), 3115–3126.
- [6] Huda, N., Wahyuni, T. S., & Fauziyah, F. D. (2021). Students ' Perceptions of Online Mathematics Learning and Its Relationship Towards Their Achievement. *Proceedings of the International Conference on Engineering, Technology and Social Science*, 529(Iconetos 2020), 522–529.
- [7] Imani, M. K., Fuat, & Afifah, A. (2025). Peran Literasi Digital Dalam Meningkatkan Kemampuan Komunikasi Matematis Siswa. *JURNAL MEDIA AKADEMIK (JMA)*, 3(8).
- [8] Meria, L. A. (2024). Persepsi Mahasiswa Terhadap Pembelajaran Matematika Dengan Menggunakan Teknologi Augmented Reality. *Jurnal Edu Research Indonesian Institute For Corporate Learning And Studies (IICLS)*, 5, 258–267.
- [9] Safira, F. P., Anestya, D. P., Kurniawan, H., Zahro, S. K., Gustira, N. G., & Nugraha, J. T. (2024). Persepsi mahasiswa terhadap dampak teknologi dan informasi yang mempengaruhi kualitas pembelajaran. *Journal of Information Systems Management and Digital Business (JISMDB)*, 1(3), 345–354.
- [10] Saputri, M., & Zamsiswaya. (2026). Penelitian Survei Dalam Penelitian Kualitatif. *Jurnal Riset Multidisiplin Edukasi*, 3, 1371–1382.
- [11] Siregar, A. R., Arsandy, Q. S., & Simanullang, M. C. (2025). *Peran Augmented Reality Sebagai Alat Bantu Pembelajaran Dalam Memfasilitasi Pemahaman Konsep Interval Pada Analisis Real The Role of Augmented Reality as a Learning Tool in Facilitating Understanding of Interval Concepts in Real Analysis*. 97–107.