



## I Mind Map Application Needs Analysis to Improve Students Mathematical Concept Understanding Ability

Uun Pertiwi <sup>1</sup>, Nanang Khuzaini <sup>2</sup>, Beneditha <sup>3</sup>, Angeline Cristin <sup>4</sup>, Felicya Clara <sup>5</sup>

<sup>1</sup> Universitas Mercu Buana Yogyakarta, Indonesia

<sup>2</sup> Universitas Mercu Buana Yogyakarta, Indonesia

<sup>3</sup> Universitas Amikom Yogyakarta, Indonesia

<sup>4</sup> Santa Clara University, United States

<sup>5</sup> Universidad Católica Boliviana, Bolivia

**Corresponding Author:** Uun Pertiwi E-mail: [unpertiwi0@gmail.com](mailto:unpertiwi0@gmail.com)

Received: Oct 06, 2023

Revised: Oct 26, 2022

Accepted: Oct 27, 2023

Online: Oct 27, 2023

### ABSTRACT

The ability to understand concepts is the mastery of the material in which students recognize, know, and are able to re-express concepts in a form that is easier to understand. However, students' conceptual understanding skills still tend to be low. So it takes teaching materials that integrate these abilities. For this reason, this study aims to analyze the need for teaching materials based on mind map applications to improve students' conceptual understanding skills. A mind map is a mind map in the form of a diagram that visually describes ideas, concepts, information, or other things. This type of research is descriptive qualitative. The research was conducted in one of the public junior high schools in Yogyakarta. The subjects in this study were 32 students of class IXA. Data collection techniques used interviews, concept understanding ability tests, and preliminary study questionnaires. While the data analysis technique uses the Miles and Huberman model which consists of data collection, data reduction, data presentation, and drawing conclusions. The results showed that teachers had not implemented mind map-assisted learning, students' conceptual understanding abilities tended to be low, students were interested in learning using mind map applications because students could develop ways of thinking and make them more active during learning

**Keywords:** *Improve Students, Mind Map, Students Mathematical*

Journal Homepage

<https://ejournal.staialhikmahpariangan.ac.id/Journal/index.php/alhijr/>

This is an open access article under the CC BY SA license

<https://creativecommons.org/licenses/by-sa/4.0/>

How to cite:

Pertiwi, U., Khuzaini, N., Beneditha, Beneditha., Cristin, A & Clara, F. (2022). I Mind Map Application Needs Analysis to Improve Students' Mathematical Concept Understanding Ability. *Al-Hijr: Journal of Adulearn World*, 1(4), 221-228. <https://doi.org/10.55849/alhijr.v1i4.530>

Published by:

Sekolah Tinggi Agama Islam Al-Hikmah Pariangan Batusangkar

## INTRODUCTION

Human development by humanizing humans. The purpose of education in Indonesia is to educate the nation's life. All subjects studied at school have a role in achieving these educational goals. one of them is math. Mathematics is a science that is able to make students have the ability to think logically, analytically. systematic, critical, and creative. However, at this time mathematics is still considered a difficult and complicated subject.

---

When learning mathematics, students tend to get bored quickly, less interested, and less active. Therefore, there needs to be a paradigm shift in studying mathematics.

Studying mathematics is not only made into rote material, but students need to understand existing concepts, the ability to understand concepts cultivate can be interpreted as a result taken from a series of events or objects that are very important in thinking and reasoning. This ability can be used to find abstract ideas that are often found in mathematics subjects, so this ability is very important for students to have. Students are said to have the ability to understand a concept if it is able to explain a definition in its own words according to important properties being able to mention examples and not examples and be able to use concepts in solving problems. However, students' conceptual understanding skills still tend to be low. So that the ability to understand students' concepts can increase, a teaching material is needed. The example of teaching materials that can be used is the i-mind map application.

Mind mapping is a learning method designed by mapping information in graphical form. Mind mapping can be mapped using branching lines of images, as well as keywords that are related to the main concept or idea. Based on observations made by researchers at one of the public junior high schools in Yogyakarta, it is known that that this application has not been used, even though this application has advantages that can make students better understand the concept of the existing material. This is in accordance with several studies using mindfulness that have been carried out where maps are able to improve students' conceptual understanding abilities. Because of these advantages, the researcher intends to conduct research to determine the analysis of the need for using mind map applications to improve students' conceptual understanding abilities.

## **RESEARCH METHODOLOGY**

This type of research is descriptive qualitative. The research was conducted in one of the public junior high schools in Yogyakarta. The subjects in this study were 32 students of class IXA. Data collection techniques using test interviews and preliminary study questionnaires. Interview technique was conducted with mathematics subject teachers to analyze teacher responses regarding students' conceptual understanding abilities and needs regarding teaching materials. The test technique is used to determine the understanding of the initial concept of students' abilities in solving math problems. The form of the test used in this research is in the form of a description question consisting of 4 questions. The student response questionnaire technique aims to analyze student responses regarding teaching materials using the i-mind map application for learning mathematics. The data analysis technique uses a model. Miles and Huberman which consists of data collection, data reduction, presentation of data and drawing conclusions.

## **RESULT AND DISCUSSION**

In this section the results will be presented. research obtained from interviews, observation, concept understanding ability test, and preliminary study questionnaire. Based on the results of interviews with mathematics teachers at Darul Hikmah Pakem

---

Junior High School in Yogyakarta, it is known that the teaching materials used are in the form of printed books as a reference for learning mathematics. Furthermore, the results of observations showed that students tend to be passive, feel bored quickly and most students still think of mathematics as a difficult subject. This is supported by the results of the questionnaire distribution of the preliminary study which showed that 47% of students liked mathematics and as many as 87% considered mathematics material to be difficult. Results Others were also obtained based on the distribution of students' conceptual understanding ability tests presented in Table 1.

TABEL 1  
TEST RESULTS

NO	Interval score	Present
1	20-29	20%
2	30-39	27%
3	40-49	20%
4	60-59	13%
5	60-69	20%

Table 1 shows that the results of the student's conceptual understanding ability test are below the KKM (Minimum Completeness Criteria) set by the school for mathematics, which is 70. While it is known that the maximum score interval obtained by students is only 69. Therefore, Table 1 concludes that the value of students' conceptual understanding ability under the KKM. So that. to perform a categorization analysis based on the empirical statistics presented in Table 2.

TABLE 2  
CATEGORIZATION OF DATA

Category	Interval score	Present
Very low	$\leq 40$	20%
Low	$29 \leq 40$	27%
Medium	$40 \leq 55$	20%
Height	$55 \leq 65$	27%
Very hight	$\geq 65$	7%

Table 2 shows that as many as 34% of students showed high students' conceptual understanding abilities, while others were in the low category. For this reason, it can be concluded that the students' conceptual understanding ability still tends to be low. This is supported by the results of interviews conducted with mathematics teachers that students' conceptual understanding skills still tend to be low. According to him, when given questions that are different from the examples, some students will be confused and think the material is different from what was taught. In fact, sometimes the questions only differ in numbers and only require students' understanding of the concepts in the material being

taught. Understanding this concept means students will still understand the material being studied even though it is presented on a different question model. Therefore, students are said to have a high understanding of concepts when they are able to work on non-routine questions given by the teacher.

The low ability of students to understand concepts requires teachers to develop an application to facilitate it. Will but the teacher does not yet have an application idea to be developed in the class. So that based on the results of the preliminary study questionnaire, it is known that all students have used mobile devices and 87% of students are very interested if learning is carried out based on game applications. Furthermore, students are very interested if the application used is I Mind Map. I mind map is a diagram that visually depicts ideas, concepts, information, or other things. Each concept idea or information is in a mind map box that is connected in an organized manner with lines (links). The description of the mind map that the researcher made is presented in

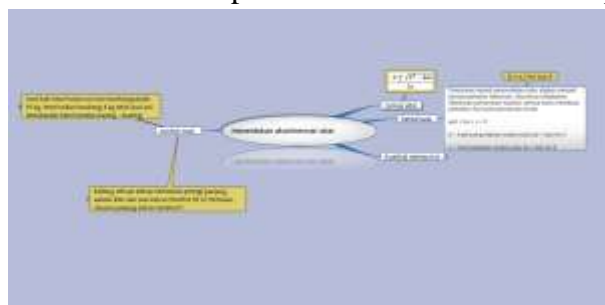


Fig 1. I Mind Map

Figure 1. Mind Map of Quadratic Equation Figure 1 is an example of a mind map made by researchers as an illustration to students regarding teaching materials that will be applied by researchers. From the results of the preliminary study questionnaire, it is known that almost all students are interested in learning using the application. In addition, according to students, learning using the i mind map will be able to make it easier for students to understand the concepts of the existing material.

Based on this information, the researchers concluded that teaching materials based on the I mind map application were able to improve students' understanding and that the I mind map teaching materials could stimulate students' understanding and needed to be developed. From the results of the analysis of student needs obtained from the distribution of questionnaires to each class IX student, it shows that students are interested in using teaching materials based on the I Mind map because students can develop their way of thinking and make them become active.

Several studies have also shown the use of the mind that improves students' mathematical concept understanding abilities [61]–[64]. In fact, the active role of students during learning is further enhanced by the application of mind mapping [61], [65]–[68]. Because of the advantages that exist from the application of mind maps, this study concludes that teaching materials that integrate mind map applications need to be applied to improve students' conceptual understanding abilities.

---

## CONCLUSION

This study concludes that teachers have not yet implemented mind map-assisted learning, and students' conceptual understanding skills tend to be low. Students are interested in learning using mind map applications because students can develop ways of thinking and make them more active during learning. This research is still in the preliminary study stage, and will still be continued at the design, implementation and evaluation stages.

## REFERENCES

- Brown, P., Levinson, S. C., & Gumperz, J. J. (1987). *Politeness: Some Universals in Language Usage* (1 ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511813085>
- Moleong, L. J. (2000). *Metodologi Penelitian Kualitatif*. Remaja Rosdakarya. [http://slims.unib.ac.id:80/index.php?p=show\\_detail&id=15061](http://slims.unib.ac.id:80/index.php?p=show_detail&id=15061)
- Adha, M. A., Arifin, I., Maisyarah, M., Sultoni, S., & Sunarni, S. (2020). ANALISIS DAMPAK ANJURAN PEMERINTAH TERHADAP BELAJAR DI RUMAH BAGI PELAKU PENDIDIKAN. *Jurnal Administrasi dan Manajemen Pendidikan*, 3(3), 216–223. <https://doi.org/10.17977/um027v3i32020p216>
- Affandi, H. (2017). Tanggung Jawab Negara dalam Pemenuhan Hak atas Pendidikan menurut Undang-undang Dasar Tahun 1945. *Jurnal Hukum Positum*, 1(2), 218. <https://doi.org/10.35706/positum.v1i2.848>
- Al Maarif, M. F., Afifah, R. A. N., Choirunnisa, A., Jannah, A. M., Zanuar, M. Y., Saddhono, K., & Yingxiang, S. (2023). Integrating and Strengthening National Vision in the Community as an Effort to Prevent Radicalization and Foster Love for the Motherland. *Pengabdian: Jurnal Abdimas*, 1(1), 20–29. <https://doi.org/10.55849/abdimas.v1i1.151>
- Amrina, A., Akhiri, I., Lee, C., & Jansee, J. (2022). Using of Visual Application in Arabic Language Learning Class X MAN 1 Kuantan Singingi. *Sciencetchno: Journal of Science and Technology*, 1(1), 1–14. <https://doi.org/10.55849/sciencetchno.v1i1.1>
- Asyafah, A. (2019). MENIMBANG MODEL PEMBELAJARAN (Kajian Teoretis-Kritis atas Model Pembelajaran dalam Pendidikan Islam). *TARBAWY: Indonesian Journal of Islamic Education*, 6(1), 19–32. <https://doi.org/10.17509/t.v6i1.20569>
- Auliani, R., Suprawihadi, R., & Avinash, B. (2023). Application of Appropriate Technology for Clean Water. *Pengabdian: Jurnal Abdimas*, 1(1), 30–39. <https://doi.org/10.55849/abdimas.v1i1.152>
- Azizah, W., Oktavia, N. A., & Mudinillah, A. (2022). The Use of The Canva Application in The Learning of Maharah Kitabah at The Islamic Boarding School Prof. Hamka Maninjau Class VII. *Sciencetchno: Journal of Science and Technology*, 1(1), 15–24. <https://doi.org/10.55849/sciencetchno.v1i1.2>
- Fadiyah, F., Fuadi, A., Nurjannah, N., Irmayanti, I., & Lita, W. (2023). Quizizz Application-Based Interactive Learning Media Development Workshop for Junior High School Teacher. *Pengabdian: Jurnal Abdimas*, 1(2), 59–65. <https://doi.org/10.55849/abdimas.v1i2.157>
- Fiqih, M., Thaha, A., Shidiq, S., Nafis, Moch. A., & Martin, W. (2023). The Concept of Internal Quality Assurance in Madrasah Diniyah PP. Al-Hidayah Tanggulangin
-



- 
- Sidoarjo. *Pengabdian: Jurnal Abdimas*, 1(1), 40–45. <https://doi.org/10.55849/abdimas.v1i1.150>
- Handoko, H., & Winarno, W. (2019). Pengembangan Perangkat Pembelajaran Matematika melalui Pendekatan Scaffolding Berbasis Karakter. *Mosharafa: Jurnal Pendidikan Matematika*, 8(3), 411–422. <https://doi.org/10.31980/mosharafa.v8i3.553>
- Hermansyah, S., Nasmilah, N., Pammu, A., Saleh, N. J., Huazheng, H., & Congzhao, H. (2023). Socialization Making Media Learning Interactive E-Module based Flippbook in Elementary School 4 Maiwa. *Pengabdian: Jurnal Abdimas*, 1(1), 1–7. <https://doi.org/10.55849/abdimas.v1i1.117>
- Holly, S., Maulik, B., & Samuel, I. (2023). Use of Whatsapp as A Learning Media to Increase Students' Learning Interest. *Sciencetchno: Journal of Science and Technology*, 2(1), 35–48. <https://doi.org/10.55849/sciencetchno.v2i1.57>
- Kartika, T. (2019). MANAJEMEN PEMBELAJARAN TAHFIDZ AL-QUR'AN BERBASIS METODE TALAQQI. *Jurnal Isema: Islamic Educational Management*, 4(2), 245–256. <https://doi.org/10.15575/isema.v4i2.5988>
- Levan's, O., Tanucan, J. C. M., & Garzozzi-Pincay, R. F. (2022). Used Learning at Al-Irsyad Bulaan Kamba Islamic Boarding School. *Sciencetchno: Journal of Science and Technology*, 1(1), 71–85. <https://doi.org/10.55849/sciencetchno.v1i1.6>
- Mallangi, N., & Weismann, I. Th. J. (2021). Pengaruh Kurikulum 2013 pada Mata Pelajaran Pendidikan Agama Kristen terhadap Perkembangan Spiritual Anak Kelas 4 & 5 SD Kristen Kalam Kudus Makassar. *Jurnal Ilmu Teologi dan Pendidikan Agama Kristen*, 2(1), 15. <https://doi.org/10.25278/jitpk.v2i1.517>
- Mulyasari, D., Noer, R. M., Sari, N., Ermawaty, E., Triharyadi, F., Tampubolon, D., & Catherine, S. (2023). Improving Health Status in The Elderly Through Health Checks and Education at Nuriah Nursing Homes in Karimun. *Pengabdian: Jurnal Abdimas*, 1(2), 75–81. <https://doi.org/10.55849/abdimas.v1i2.183>
- Mustafiyanti, M., Putri, M. P., Muyassaroh, M., Noviani, D., & Dylan, M. (2023). A Form of Independent Curriculum, an Overview of Independent Learning at State Elementary School 05 Gelumbang Muaraenim. *Pengabdian: Jurnal Abdimas*, 1(2), 82–96. <https://doi.org/10.55849/abdimas.v1i2.185>
- Nicholas, T., James, G., & Robert, K. (2023). Moral Aqidah Learning Using Video-Based Technology. *Sciencetchno: Journal of Science and Technology*, 2(1), 1–16. <https://doi.org/10.55849/sciencetchno.v2i1.65>
- Noer, R. M., Silalahi, A. D., Mulyasari, D., Sari, N., Ermawaty, E., Triharyadi, F., Tampubolon, D., & Bevoor, B. (2023). Improving the Degree of Health in the Elderly Through Health Checks and Education. *Pengabdian: Jurnal Abdimas*, 1(1), 8–13. <https://doi.org/10.55849/abdimas.v1i1.139>
- Nur Utami, K., & Mustadi, A. (2017). PENGEMBANGAN PERANGKAT PEMBELAJARAN TEMATIK DALAM PENINGKATAN KARAKTER, MOTIVASI, DAN PRESTASI BELAJAR SISWA SEKOLAH DASAR. *Jurnal Pendidikan Karakter*, 8(1). <https://doi.org/10.21831/jpk.v7i1.15492>
- Pane, A., & Darwis Dasopang, M. (2017). BELAJAR DAN PEMBELAJARAN. *FITRAH: Jurnal Kajian Ilmu-ilmu Keislaman*, 3(2), 333. <https://doi.org/10.24952/fitrah.v3i2.945>
- Putra, V. N. A. (2018). Manajemen Perencanaan Pembelajaran untuk Kaderisasi Muballigh di Pondok Pesantren Takwinul Muballighin Yogyakarta. *MANAGERIA: Jurnal Manajemen Pendidikan Islam*, 3(1), 133–155. <https://doi.org/10.14421/manageria.2018.31-07>
-

- 
- Putri, N. A., Kamaluddin, K., & Amrina, A. (2023). TikTok Application on Achievement and Learning Motivation at Influence Colleges. *Sciencetechno: Journal of Science and Technology*, 2(1), 80–96. <https://doi.org/10.55849/sciencetechno.v2i1.62>
- Ranal, A., Husniyah, H., Fienti, Y., Putri, S. A., Lenin, F., Musrika, M., Diana, D., & Xin, D. (2023). Physical Activity Training Education for the Elderly at Nursing Homes. *Pengabdian: Jurnal Abdimas*, 1(1), 14–19. <https://doi.org/10.55849/abdimas.v1i1.143>
- Saputra, A. G., Rahmawati, T., Andrew, B., & Amri, Y. (2022). Using Canva Application for Elementary School Learning Media. *Sciencetechno: Journal of Science and Technology*, 1(1), 46–57. <https://doi.org/10.55849/sciencetechno.v1i1.4>
- Utami, L. D., Amin, M., Mustafiyanti, M., & Alon, F. (2023). Masjid Friendly: Mosque Based Economic Empowerment. *Pengabdian: Jurnal Abdimas*, 1(2), 97–106. <https://doi.org/10.55849/abdimas.v1i2.186>
- Vicky, D., Adrianna, H., & Phan, B. (2023). Use of Gadgets by Early Childhood in the Digital Age to Increase Learning Interest. *Sciencetechno: Journal of Science and Technology*, 2(1), 17–34. <https://doi.org/10.55849/sciencetechno.v2i1.58>
- Wahyuni, S., Areva, D., & Dahren, L. (2015). Proses Penetapan Kriteria Ketuntasan Minimal (KKM) pada Mata Pelajaran Ekonomi Kelas X di SMA Se-Kecamatan Lubuk Kilangan Kota Padang. *Jurnal Ipteks Terapan*, 8(3). <https://doi.org/10.22216/jit.2014.v8i3.6>
- Wanti, L. P., Romadloni, A., Somantri, O., Sari, L., Prasetya, N. W. A., & Johanna, A. (2023). English Learning Assistance Using Interactive Media for Children with Special Needs to Improve Growth and Development. *Pengabdian: Jurnal Abdimas*, 1(2), 46–58. <https://doi.org/10.55849/abdimas.v1i2.155>
- Zendrato, J. (2016). TINGKAT PENERAPAN RENCANA PELAKSANAAN PEMBELAJARAN DALAM PELAKSANAAN PEMBELAJARAN DI KELAS Suatu Studi Kasus di SMA Dian Harapan Jakarta. *Scholaria: Jurnal Pendidikan dan Kebudayaan*, 6(2), 58. <https://doi.org/10.24246/j.scholaria.2016.v6.i2.p58-73>
- Jamil, H., & Agung, N. (2022). Tantangan Pembelajaran Bahasa Arab Di Era Society 5.0: Analisis Pembelajaran Bahasa Arab Berbasis Aplikasi Interaktif. *Alibbaa': Jurnal Pendidikan Bahasa Arab*, 3(1), 38–51. <https://doi.org/10.19105/ajpba.v3i1.5536>
- Nugroho, A. (2012). Pengembangan Model Pembelajaran Jarak Jauh Berbasis Web. *Jurnal Transformatika*, 9(2), 72. <https://doi.org/10.26623/transformatika.v9i2.60>
- Salim, N. Z., Djam'annuri, D., & Aminullah, A. (2018). Studi Komparasi Konsep Pendidikan Karakter Anakmenurut Al-Ghazali Dan Thomas Lickona. *Manarul Qur'an: Jurnal Ilmiah Studi Islam*, 18(2), 135–153. <https://doi.org/10.32699/mq.v18i2.944>
- Ulya, A., Muqtadiroh, F. A., & Muklason, A. (2021). Identifikasi Faktor Resistansi Guru Terhadap Teknologi Sebagai Pendukung Pembelajaran di Pondok Pesantren Salaf. *Jurnal Nasional Teknologi dan Sistem Informasi*, 7(1), 18–26. <https://doi.org/10.25077/teknosi.v7i1.2021.18-26>
- ZAM, E. M. (2021). Peran Literasi Teknologi Informasi Dan Komunikasi Pada Pembelajaran Jarak Jauh Di Masa Pandemi Covid-19. *EDUTECH: Jurnal Inovasi Pendidikan Berbantuan Teknologi*, 1(1), 11–20. <https://doi.org/10.51878/edutech.v1i1.176>
-

---

**Copyright Holder :**

© Uun Pertiwi et al. (2022).

**First Publication Right :**

© Al-Hijr: Journal of Adulearn World

**This article is under:**

