Analysis Of Utilization Of Information Technology In Learning Mathematics

Ulfiyanti
Jurusan Matematika, FMIPAK, Universitas Negeri Manado, Indonesia
Victor R. Sulangi
Jurusan Matematika, FMIPAK, Universitas Negeri Manado, Indonesia
Sanjte M. Salajang
Jurusan Matematika, FMIPAK, Universitas Negeri Manado, Indonesia

Korespondensi penulis: ulfiyanti220@gmail.com

Abstract.This research aims to determine the utilization of information technology in mathematics learning in Class VIII of SMP Negeri 1 Parigi Selatan. This is a case study that describes an actual situation. In collecting data, the researcher used data collection procedures through interviews with informants, who, in this case, were students, as the source of data and information. Qualitative data analysis in this research uses the SWOT analysis method, which systematically identifies various factors to formulate company strategies. This analysis is based on the logic that can maximize strengths and opportunities while minimizing weaknesses and threats. Then, identify the types of errors and conclude. From the strengths perspective, the results indicate that implementing online learning allows learning resources to be easily accessed online. From the perspective of weaknesses, an unstable internet connection affects students' focus on learning and teaching. From the perspective of opportunities, online learning enhances students' self-learning skills and provides new insights into technology and learning. Finally, from the perspective of threats, students' learning motivation decreases.

Keywords: SWOT Analysis, Information Technology, Mathematics Learning

Abstrak. Penelitian ini bertujuan untuk mengetahui bagaimana pemanfaatan teknologi informatika dalam pembelajaran matematika di SMP Negeri 1 Parigi Selatan kelas VIII. Penelitian ini bersifat studi kasus, yaitu penelitian yang menggambarkan suatu keadaan yang sebenarnya. Dalam mengumpulkan data peneliti prosedur pengambilan data yaitu wawancara terhadap informan, yang dimaksud adalah siswa yaitu sebagai sumber data dan informasi. Analisis data kualitatif dalam penelitian ini menggunakan metode analisis SWOT, yaitu analisis yang mengidentifikasi berbagai faktor secara sistematis untuk merumuskan strategi perusahaan. Analisis ini didasarkan pada logika yang dapat memaksimalkan kekuatan dan peluang namun secara bersamaan dapat meminimalkan kelemahan dan ancaman. Kemudian tunjukkan jenis kesalahannya dan buat kesimpulan. Hasil menunjukkan pelaksanaan pembelajaran daring dalam perspektif *strength* sumber belajar dapat dengan mudah diakses di internet, pelaksanaan pembelajaran daring dalam perspektif *weakness* jaringan internet yang tidak stabil mempengaruhi fokus siswa dalam belajar dan mengajar, pelaksanaan pembelajaran daring dalam perspektif *opoportunity* meningkatkan kemandirian belajar siswa dan mendapat wawasan baru mengenai teknologi dan pembelajaran, dan pelaksanaan pembelajaran daring dalam perspektif *threat* motivasi belajar siswa menurun.

Kata Kunci: Analisis SWOT, Teknologi Informatika, Pembelajaran Matematika

INTRODUCTION

In this era, the development of technology is very rapid, so every corner of people's lives is touched by technology. One of the technologies often used by the public is mobile phones (Christmastano, 2017; Rukajat, 2018). Mobile phones are widely used for social media, chatting, and entertainment (Fatimah, 2016; Salamah, 2020). Mobile phones are also used to assist in school teaching and learning (Sidiq & Choiri, 2019; Faudi et al., 2020) because cell phones are a means of getting sources of information other than teachers and textbooks (Silalahi, 2015; Handarini & Wulandari, 2020).

In the teaching and learning process at this time, the use of mobile phones has been permitted by some teachers to support learning. By allowing the use of mobile phones during the teaching and learning process, it makes it easier for students to obtain broader and more learning material compared to just using textbooks, especially in mathematics learning, where students can obtain more learning material and examples of questions and their solutions (Sugiyono, 2015; Hayati, 2017).

Even though students can get educational material quickly, they prefer to use it for other things. For example, using it for social media, chatting, or other entertainment (Lurdes, 2015; Susilawati & Harun, 2017). This is evident from the less time allocated for learning activities than the time allocated for other means (Nurhasanah & Sobandi, 2016). Student learning outcomes may decrease (Maharani, 2020).

Based on the interviews conducted by researchers with mathematics teachers at Grade VIII South Parigi 1 Public Middle School, several teachers permitted students during the teaching and learning process. However, not all Grade VIII students have cell phones, and not all have the same quality cell phones. In the teaching and learning process, it was found that teachers sometimes lacked control over students, so students used their mobile phones for other things. Apart from being at school, students also use mobile phones at home, but they only allocate a little time for studying compared to other things. According to the description above, the researcher conducted a study entitled "Analysis of Utilization of Information Technology in Mathematics Learning."

METHOD

The type of research used is a case study that describes a situation or reveals a problem following the actual situation. The conclusions drawn apply only to the object under study. At the same time, the research location is at SMP Negeri 1 Parigi Selatan, so the data source obtained is the subject of students of SMP Negeri 1 Parigi Selatan.

To obtain valid data, in this study, the researcher used several data collection procedures, namely interviews. Interviews with informants in question were students, namely as a source of data and information, carried out intending to extract information about the focus of the research. To obtain the desired data, the researcher used an interview guide made after the test results data were obtained. The interview subjects were students with different mistakes that represented the mistakes of other students who made the same mistakes. Furthermore, the questions posed to students followed the mistakes they experienced in working on these questions, which the supervisor and validator approved.

RESULT AND DISCUSSION

This descriptive qualitative research aims to describe the use of information technology in learning mathematics. This research was carried out in the even semester of 2023 with 15 students in class VIII B at SMP Negeri 1 Parigi Selatan as the subject. The research data were obtained using structured interview methods. The following will explain the research findings when the writer conducted research VIII B at SMP Negeri 1 Parigi Selatan.

The implementation of this research began with asking permission from the Dean of the Faculty of Mathematics and Natural Sciences, Manado State University, to be submitted to the principal of SMP Negeri 1 Parigi Selatan. Based on permit number 1748/UN41.1/PP/2023, the author obtained permission from the school principal to collect data through interviews with class VIII B students for the 2022/2023 school year. Data were collected from 10 May 2023 to 11 May 2023 by conducting interviews with 15 South Parigi 1 Public Middle Schools.

Research data on the use of informatics technology in mathematics in class VIII B of SMP Negeri 1 Parigi Selatan are as follows:

1. Students who do not have information technology

   a. S.1 students

When conducting interviews with S.1 students, it was found that they needed information technology tools, be it cell phones or personal laptops. S.I. said that only his mother had a cell phone, and her mother needed one, so she never brought a cell phone to school. Because he was only with his friends during the learning process, which required using a cell phone to obtain learning material, he also added that even at home, he rarely uses a cell phone; even if he borrows his mother's cellphone, he only uses it to open social media.

b.   S.7 students

When conducting interviews with S.7 students, they discovered they needed information technology tools, cell phones, or personal laptops. S.7 said that only his mother had a cellphone, but it differed from S.1. Student S.7 was given by his mother to bring her mother's cell phone for learning. According to S.7, H.P. is almost used in all subjects, and mathematics is no exception. he added that cell phones are usually used in learning mathematics at school to add material or find examples of other questions. However, there are times when using the internet or applications to work on questions given by the teacher, not only that WhatsApp is also an alternative for sharing assignment answers. Apart from using it to look for materials at school, he usually uses his cell phone for social media. At home, he was using the cell phone only for social media and entertainment and sometimes using the cell phone to ask for answers for homework.

2.   Students Who Have Information Technology Tools

a.   S.2 students

When conducting interviews with S.2 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at school, he used his cell phone to play games; he also added that he very rarely used his cell phone to look for material as requested by his teacher. He said he only asked for materials from his friends if he was ordered to look for materials. Most similar to being at school at home. He uses his cell phone to play games, and if the teacher gives a homework assignment, he will ask for answers from his friends via WhatsApp.

b.   S.3 students

When conducting interviews with S.3 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at S.3 school,

he used his cell phone to look for additional material as instructed by his teacher, but he added that he often used his cell phone to play social media while the teaching and learning process was in progress. At home, he uses his cellphone to play social media, and if the teacher gives him a homework assignment, he will ask for answers from his friends via WhatsApp.

c.   S.4 students

When conducting interviews with S.4 students, it was found that the student had an information technology device and a cell phone, but he did not have a personal laptop; only his older brother had a laptop. While at school, S.4 used a cell phone to look for additional material as instructed by the teacher. Apart from adding to the material, he sometimes uses an application to answer the questions. He added that he uses his cell phone for other activities only during breaks or when the teacher is not teaching. He uses his cell phone at home depending on his mood, sometimes playing social media games or entertainment. He also added that sometimes he borrows his brother's laptop to watch Korean dramas. Furthermore, if there is homework, he sometimes uses the internet or applications to do it but sometimes asks for answers from his friends.

d.   S.5 students

When conducting interviews with S.5 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at school, S.5 used his cell phone to look for additional material as instructed by his teacher, but he added that he often also used his cell phone to play social media while the teaching and learning process was in progress. At home, he uses his cellphone to play social media, and if the teacher gives him a homework assignment, he will ask for answers from his friends via WhatsApp.

e.   S.6 students

When conducting interviews with S.6 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at school, S.6 used his cell phone to look for additional material as ordered by his teacher, but he added that he often also used his cell phone to play social media while the teaching and learning process was in progress. At home, he uses his cellphone to play social media, and if the teacher gives him a homework assignment, he will ask for answers from his friends via WhatsApp.

f.   S.8 students

When conducting interviews with S.8 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at school, S.8 used his cell phone to look for additional material as instructed by his teacher, but he added that he often used his cell phone to play games while the teaching and learning process was in progress. At home, he also uses his cell phone to play games, and if the teacher gives a homework assignment, he will ask for answers from his friends via WhatsApp.

g.   S.9 students

When conducting interviews with S.9 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at school, he used his cell phone to play games; he also added that he very rarely used his cell phone to look for material as requested by his teacher. He said he only asked for materials from his friends if he was ordered to look for materials. Most similar to being at school at home. He uses his cell phone to play games, and if the teacher gives a homework assignment, he will ask for answers from his friends via WhatsApp.

h.   S.10 students

When conducting interviews with S.10 students, it was discovered that the student had an information technology device and a cell phone, but he did not have a personal laptop; only his mother had one. While at school, S.10 used a cell phone to look for additional material as instructed by the teacher. Apart from adding to the material, he sometimes uses an application to answer the questions. He added that he uses his cell phone for other activities only during breaks or when the teacher is not teaching. He uses his cell phone at home depending on his mood, sometimes playing games, social media, or entertainment. He also added that sometimes he borrowed his mother's laptop to watch Korean dramas. Furthermore, if there is homework, he sometimes uses the internet or applications to do it but sometimes asks for answers from his friends.

i.   S.11 students

When conducting interviews with S.11 students, it was found that the student had an information technology device and a cell phone, but he did not have a personal laptop; only his parents and older siblings had laptops. While at school, S.11 used a cell phone to look for additional material as instructed by the teacher. Apart from adding to the material, he also sometimes uses an application to answer the questions; he added that he usually plays games

during lessons. He uses a cell phone at home depending on his mood, sometimes playing games, social media, or entertainment. He also added that sometimes he uses a laptop to play games. Furthermore, if there is homework, he sometimes uses the internet or applications to do it but sometimes asks for answers from his friends.

j.   S.12 students

When conducting interviews with S.12 students, it was discovered that the student had an information technology device and a cell phone, but he did not have a personal laptop; only both parents had laptops. While at school, S.12 used a cell phone to look for additional material as instructed by the teacher. Apart from adding to the material, he sometimes uses an application to answer the questions. He added that he usually also plays social media during lessons. He uses a cell phone at home depending on his mood, sometimes playing games, social media, or entertainment. He also added that sometimes he uses a laptop to watch Korean dramas. Furthermore, if there is homework, he sometimes uses the internet or applications to do it but sometimes asks for answers from his friends.

k.   S.13 students

When conducting interviews with S.13 students, they found that they had information technology tools, namely cell phones and personal laptops. While at school, S.13 used a cell phone to look for additional material as instructed by the teacher. Apart from adding to the material, he sometimes uses an application to answer the questions. He added that he usually also plays social media during lessons. He uses a cell phone at home depending on his mood, sometimes playing games, social media, or entertainment. He also added that sometimes he uses a laptop to watch Korean dramas. Moreover, if there is homework, he sometimes uses the internet or applications to do it but sometimes asks for answers from his friends.

l.   S.14 students

When conducting interviews with S.14 students, they found that they had information technology tools, namely cell phones and personal laptops. While at school, S.14 used a cell phone to look for additional material as instructed by the teacher. Apart from adding to the material, he sometimes uses an application to answer the questions. He added that he also usually plays games during lessons. He uses a cell phone at home depending on his mood, sometimes playing games, social media, or entertainment. He also added that sometimes he

uses a laptop to play games. Moreover, if there is homework, he sometimes uses the internet or applications to do it but sometimes asks for answers from his friends.

m.   S.15 students

When conducting interviews with S.15 students, it was discovered that the student had an information technology device, a cell phone, but he did not have a laptop. While at school, he used his cell phone to play games. He also added that he rarely used his cell phone to look for material as requested by his teacher. He said he only asked for materials from his friends if he was ordered to look for materials. Most similar to being at school at home. He uses his cell phone to play games, and if the teacher gives a homework assignment, he will ask for answers from his friends via WhatsApp.

The results of the online learning SWOT analysis that the author found at SMP Negeri 1 Parigi Selatan are as follows; Strength (Strength) consists of learning resources that can be easily accessed on the internet, can still carry out the teaching and learning process, the teacher is not present. Weaknesses include an unstable internet network, affecting student focus in learning and teaching. The opportunity consists of increasing student learning independence and gaining new insights about technology in learning. Finally, the threat consists of decreased student learning motivation and students who need information technology tools.

CONCLUSION

Based on the results of research and discussion, it can be concluded that

1.   Implementation of online learning in the aspect of Strength: Learning resources can be easily accessed online but can still carry out the teaching and learning process if the teacher is not present.

2.   Implementation of online learning on the Weakness aspect: unstable internet network, affecting student focus in learning and teaching.

3.   Implementation of online learning in the Opportunity aspect: increasing student learning independence and gaining new insights about technology in learning.

4.   Implementation of online learning on the Threat aspect: Student learning motivation decreases, and students who need information technology tools.

REFERENCES

Christmastianto, I. A. (2017). Analisis SWOT Implementasi Teknologi Finansial Terhadap Kualitas Layanan Perbankan di Indonesia. *Jurnal Ekonomi dan Bisnis, 20*(1), 133-144.

Fatimah, F. N. (2016). *Teknik Analisis SWOT: Pedoman Menyusun Strategi yang Efektif & Efisien serta Cara Mengelola Kekuatan dan Ancaman.* Yogyakarta: Quadrant.

Fuadi, T. M., Musriandi, R., & Suryani, L. (2020). COVID-19: Penerapan Pembelajaran Daring di Perguruan Tinggi. *Jurnal Dedikasi Pendidikan, 4*(2), 193-200.

Handarini, O. I., & Wulandari, S. S. (2020). Pembelajaran Daring Sebagai Upaya Study From Home (SFH) Selama Pandemi Covid 19. *Jurnal Pendidikan Administrasi Perkantoran (JPAP), 8*(3), 496-503.

Hayati, S. (2017). *BELAJAR dan PEMBELAJARAN BERBASIS PEMBELAJARAN KOOPERATIF*. Graha Cendika.

Lurdes Martins, M. D. (2015). How to Effectively Integrate Technology in the Foreign Language Classroom for Learning and Collaboration. *Procedia - Social and Behavioral Sciences, 174*, 77-84.

Nurhasanah, S., & Sobandi, A. (2016). *Minat Belajar Sebagai Determinan Hasil Belajar Siswa. I(1)*, 128-135.

Maharani, a. (2020). Comutational Thinking Dalam Pembelajaran Matematatika Era Society 5 .0. Euclid, (7(2), 86-96

Rukajat, A. (2018). *Pendekatan Peneitian Kualitatif*. Yogyakarta: Deep Publish.

Salamah, Z. H. (2020). Pembelajaran Online Berbasis Media Google Formulir Dalam Tanggap Work From Home masa Pandemi Covid-19 Di Madrarasah Ibtidahyah Negeri (Min) 1 Paser. Jurnal Of Islamic Education, 8

Sidiq, U., & Choiri, M.M. (2019). *Metode Penelitian Kualitatif di Bidang pendidikan*. Ponegoro: Nata Karya.

Silalahi, S. P. (2015). Penerapan SWOT Sebagai Dasar Penentuan Strategi Pemasaran Pada PT. Bank Rakyat Indonesia TBK, Kabanjahe. *Jurnal Ilmiah Methonomi, 1*(2), 1-17.

Sugiyono. (2015). *Metode Penelitian Kombinasi (Mix Methods)*. Alfabeta

Susilawati, I. M., & Harun, M. (2017). Analisis SWOT Sebagai Dasar Strategi Branding Pada Madrasah Ibtidaiyah Alhidayah, Cireunde, Ciputat. *Tarbawi: Jurnal Keilmuan Manajemen Pendidikan, 3*(01), 111-128.