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Science Teachers' Perceptions of Web-Based Learning

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Abstrak

Penggunaan media pembelajaran berbasis teknologi merupakan kebutuhan dalam proses pembelajaran saat ini. Hal ini dikarenakan dunia telah memasuki fase baru perkembangan teknologi di mana pendidikan berperan. Pendidikan berbasis teknologi menghasilkan generasi yang melek teknologi. Akibatnya, upaya guru diperlukan untuk memasukkan teknologi ke dalam pembelajaran di kelas. Pembelajaran berbasis web merupakan salah satu contoh penerapan teknologi dalam pendidikan. Google Sites digunakan untuk pembelajaran berbasis web dalam penelitian ini. Tujuan dari penelitian ini adalah untuk menganalisis persepsi guru IPA terhadap penggunaan Google Sites di kelas. Metode deskriptif dengan pendekatan kuantitatif digunakan dalam penelitian ini. Subyek penelitian adalah guru IPA di salah satu kecamatan di Indonesia. Pengumpulan data menggunakan Focus Group Discussion, guru diminta pendapat atau persepsinya tentang penggunaan Google Sites di kelas. Teknik analisis data menggunakan teknik analisis model interaktif yang terdiri dari pengumpulan data, reduksi data, display data, dan penarikan kesimpulan. Hasil penelitian menemukan Google Sites, menurut mayoritas guru, dapat digunakan sebagai media pembelajaran berbasis website. Google Sites memenuhi enam indikator dasar peringkat media yang baik, menurut guru. Keenam indikator tersebut adalah kesesuaian media dengan tujuan pembelajaran, ketepatan fakta pendukung, konsep, dan prinsip dalam isi pelajaran, kepraktisan, keluwesan, dan daya tahan penggunaan, keterampilan guru dalam menggunakan Google Sites, target pengguna media, dan kualitas teknis.

***Kata kunci*:** *Science, teacher, perceptions, web-based learning, google sites.*

Abstract

The use of technology-based learning media is a requirement in today's learning process. This is because the world has entered a new phase of technological development in which education plays a role. Technology-based education produces a generation who are technologically literate. As a result, teacher efforts are required to incorporate technology into classroom learning. Web-based learning is one example of a technological application in education. Google Sites was used for web-based learning in this study. The purpose of the study is to analyze the perception of science teachers on the use of Google Sites in the classroom. A descriptive method with a quantitative approach was used in the research. The subjects of the study were science teachers in an Indonesian sub-district. Data collection is use Focus Group Discussion, the teacher was asked for his thoughts or perceptions on using Google Sites in the classroom. The data analysis technique used analysis interactive model technique consists of data collection, data reduction, data display, and conclusions. The result of study found Google Sites, according to the majority of teachers, can be used as a website-based learning media. Google Sites meets the six basic indicators of good media ratings, according to teachers. The six indicators are the media's suitability for learning objectives, the accuracy of supporting facts, concepts, and principles in lesson content, the practicality, flexibility, and durability of use, teachers' skills in using Google Sites, target media users, and technical quality.

Keywords: Science, teacher, perceptions, web-based learning, google sites.

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1. INTRODUCTION

Education plays a very important role in improving reliable human resources. The low quality of education is the cause of the crisis of human resources considering that the current era is increasingly advancing, which automatically affects economic development (Ramli et al., 2016; Ritonga, 2021). So, it is normal for job providers to need human resources who are truly competent to work together. Humans will be able to take care of natural resources properly. One way to improve the quality of education is to follow the development of technological advances so as not to create a gap between education and technology (Carayannis & Morawska-Jancelewicz, 2022; Maimun & Hakim, 2021). One way to do this

is by making or utilizing technology in the learning process. The development of civilization has experienced a shift from the analog world to the digital dimension through the rapid advancement of information technology. At the same time, educators are required to be able to combine traditional learning models with advances in information technology in order to balance the diverse learning styles of students (Lai, 2019; Syarif, 2013). The use of information and communication technology is growing along with the development of globalization. Moreover, for the last three years, Indonesia has experienced the Covid-19 pandemic which has caused problems in education (Churiyah et al., 2020; Purwoko et al., 2020). The government has restricted activities that involve large numbers of people to prevent the spread of the virus. Therefore, Indonesia sets rules to run online learning guided by online learning platforms (Agung & Surtikanti, 2020; Pratita et al., 2021). Habits that have grown and developed over the past three years have spurred the school ecosystem to continue to use technology to support their learning. Teachers and students are no longer awkward using computers in learning. Assignments have been given online, as well as submissions. All of this is inseparable from the ability of teachers to manage classes with the help of technology.

In addition to mastering professional competencies, teachers must also master pedagogic competencies under current developments. In pedagogic competence, it is explained that teachers must be able to use and utilize information and communication technology in carrying out learning (Agustini et al., 2019; König et al., 2020). Teachers should not be fixated on face-to-face learning models, but teachers must also be able to use technology that makes it easier for them to deliver subject matter. One of the technologies used by teachers in delivering subject matter is web-based learning. Web-based learning includes all educational interventions that use the internet. Until now, there are three classifications in web-based learning, namely tutorials, online group discussions, and virtual patients (Cook, 2007; Govindarajan, 2021). Online tutorials are similar to face-to-face lectures. This tutorial is run like learning that is carried out in class. Tutorials are facilitated with multimedia (sound, images, films, and animations) and are linked to the website. Online discussions are similar to small group face-to-face sessions. Similar to the discussion process that takes place in the classroom, online discussion is also a part of the learning process facilitated by the teacher (Alonso et al., 2005; Van Bruggen, 2005). The role of the teacher here is to monitor and guide the discussion according to the needs of the students. Communication that occurs in this online discussion can be asynchronous or synchronous. A virtual patient is a computer-based simulation that allows students to consult with teachers outside of learning hours.

Online learning uses Information Communication Technology (ICT). Many researchers define ICT as a tool that provides great opportunities to improve teacher performance in carrying out learning practices (Bingimlas, 2009; Papadakis & Kalogiannakis, 2017; Yefimenko et al., 2021). Apart from the successful implementation of ICT in various subjects (Kim et al., 2013; Papadakis & Kalogiannakis, 2017), it was also suggested in previous studies that several factors hinder the implementation of ICT for teaching and learning, such as negative attitudes towards the influence of technology, lack of internet access. and technological facilities and equipment, the poor condition of the existing physical infrastructure, and teachers who are less qualified to apply and use technology (Blackwell et al., 2013; Frolova & Rogach, 2021). Choosing the right ICT tools is not an easy task, as they must be selected to meet specific curriculum objectives. Utilization of ICT in teaching involves four stages: (1) discovery, (2) learning how to operate it, (3) understanding how and when to use ICT, and (4) specialization (Bingimlas, 2009; Wu et al., 2018). The selection of learning media is a challenge for teachers, especially in online learning. There are several obstacles to online learning, especially in learning natural sciences. One of them

is how to convey abstract concepts into context. It is necessary to choose the right media to explain abstract concepts. For example, the teacher explains about atoms. Teachers cannot use paper media to teach atoms. The media that make it possible to teach atoms is using a virtual lab. Consideration of choosing media on science subject is an important thing. It studies natural phenomena along with natural events requires the elaboration of facts, concepts, laws, and their validity which are proven from various series of studies (Tala & Vesterinen, 2015; Waldrip et al., 2010). Science is seen from two sides, namely science as learning that produces a product of the work of scientists and science learning as a process of scientists working to produce knowledge (Rohaeti et al., 2019; Tan et al., 2020).

So that the use of learning media will be very influential and determine the success of a process of learning activities. The use of media as an intermediary can achieve the learning objectives. To achieve the learning objectives, the media is certainly selected based on the suitability of the subjects material. There are many choices of media types that can be used, namely images, audio, video, graphics, virtual labs, and others (Hendra Saputra & Pasha, 2021; Sakiah & Effendi, 2021). In online learning, as it is today, one of the media that makes it possible to cover all types of media is Google Sites, a web-based application that is user-friendly because it can be used only by using mobile phones and the internet (Adzkiya & Suryaman, 2021; Afifah et al., 2021). Google Sites is one of the programs launched by Google. The use of Google Sites can help teachers to manipulate objects learning. This is in accordance with Piaget's statement that knowledge can appear and increase with the number of interactions with the object being studied (Aminah et al., 2021; Craig Gamble, 2017). Educators can create and operate Google Sites with ease even if the user is not familiar, and also students can use/operate Google Sites easily because it is similar to accessing a website.

The science teacher community in Lubuk Sikaping District recently started using Google Classroom to manage student assignment submissions. However, most teachers have never used Google Sites. Meanwhile, teachers need need media that can assist them in monitoring student activities at home and providing learning resources that are accessible to all pupils. Previous research indicates that utilising learning sites has advantages (K. W. Chu et al., 2019). It would have the benefit of automating the process and allowing teachers to view the wiki interaction process, allowing them to watch the students' progress over time and intervene as needed. Early last July, the author conducted a focus group discussion with teachers about Google sites. After giving a demo about the use of Google Sites, the teachers were asked for their perceptions about the use of Google Sites in the classroom. The purpose of the study is to analyze the perception of science teachers on the use of Google Sites in the classroom.

2. METHODS

This study used a descriptive method with a qualitative approach. Descriptive research is one type of research whose purpose is to present a complete picture of a social setting or is intended to explore and clarify a phenomenon or social reality. The aim is to analyze several variables related to the problem and unit under study (Arikunto, 2013). Data were collected using a questionnaire instrument and interview sheets. The subjects of the research were 20 science teachers in Lubuk Sikaping District. Before being used, the instrument was validated by expert lecturers at the Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang.

Data collection using a questionnaire instrument was carried out directly during Focus Group Discussions (FGD) with science teachers. The purpose of using a questionnaire was to determine the perception of science teachers on Google Sites. Data collection was continued by using an interview sheet. Interviews were conducted in-depth to confirm the answers

given when filling out the questionnaire. The data analysis technique used as a reference in this study uses the Miles and Huberman model. According to Miles and Huberman, the Analysis Interactive Model technique consists of data collection, data reduction, data display, and conclusions (Syawaludin, A. et al., n.d.). The analysis scheme is show in Figure 1.

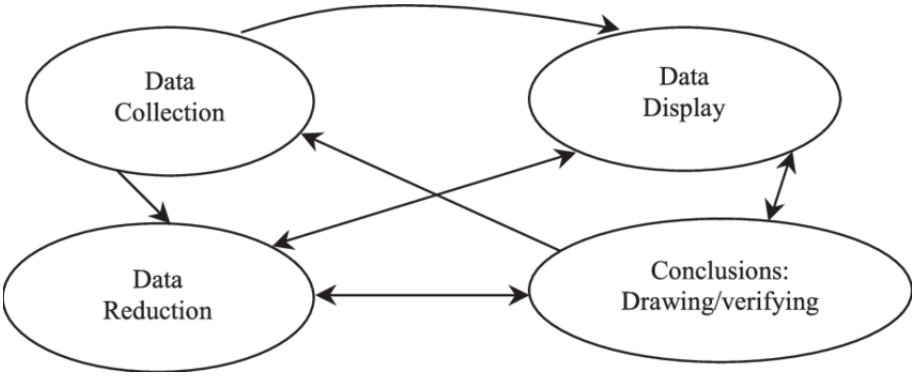


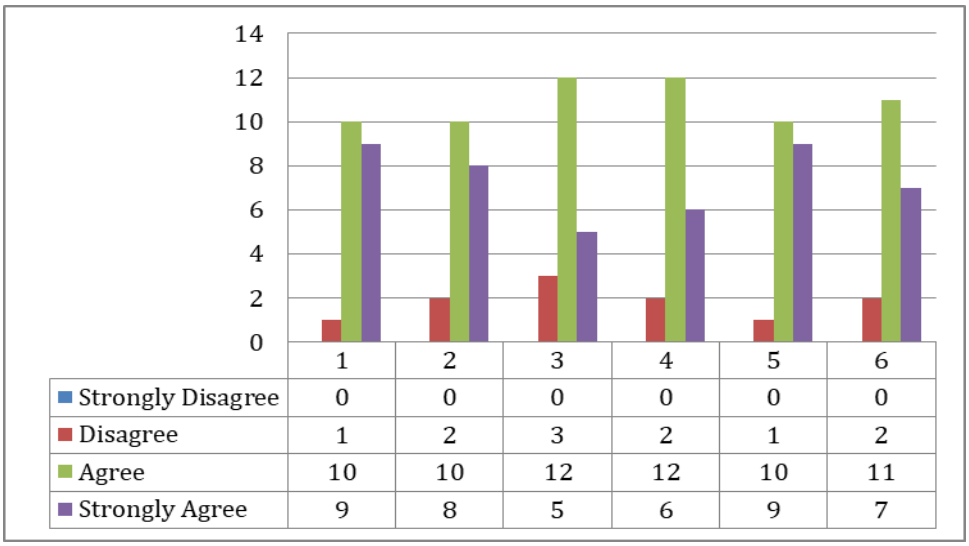
Figure 1. Miles and Huberman Data Analysis Scheme

Figure 1 shows the relationship between the interactive nature of data collection and analysis, data collection is a continuous process in the data analysis scheme. Data reduction is a way of concluding, where in the process it makes it easier to present and make conclusions from the data, which makes clear data that previously had not been seen to be clearer (Rijali, 2019).

3. RESULTS AND DISCUSSION

Results

This study was conducted to describe the function and role of Google Sites in learning and to analyze the perception of science teachers on the use of Google Sites. A total of 20 teachers filled out a questionnaire instrument consisting of 6 indicators. Each question item was filled with numbers 1 to 4 according to the Likert scale range. After collecting the data, the reduction process was carried out by grouping the same data. The result analysis is show in Figure 2.



	1	2	3	4	5	6
Strongly Disagree	0	0	0	0	0	0
Disagree	1	2	3	2	1	2
Agree	10	10	12	12	10	11
Strongly Agree	9	8	5	6	9	7

Figure 2. Analysis Result

Base on Figure 2, in the first indicator, none of the teachers chose zero (strongly disagree). While the number of teachers who chose the number 1 (disagree) is one person. The rest, as many as 10 teachers agree and 9 teachers strongly agree with the indicator. Similar to the first indicator, the second indicator is dominated by the opinions of teachers who agree with as many as 10 people. The number of teachers who stated strongly agree was 8 people. In the third indicator, 12 teachers agreed and 6 teachers disagreed. Furthermore, in the fourth indicator, the number of teachers who agreed was 12 people, while the teachers who strongly agreed were 6 people. It was not much different for the fifth and sixth indicators, with as many as 10 and 11 teachers who agree, while as many as 9 and 7 teachers state strongly agree. If reduced, the numerical data converted into graphical data to make it easier to read the data.

Discussion

The final step in the Miles and Huberman data analysis scheme is drawing conclusions and verifying the data which is then explained in a description to comprehensively examine the data that has been obtained. In this paper, data collection was followed by in-depth interviews to confirm the data that had been obtained on the questionnaire sheet. This study discusses the perception of science teachers on the use of Google Sites in the classroom. Perception is a direct response of absorption or process of someone knowing some senses. Perception is the impression that a person gets from his five senses. Then, these impressions are analyzed or organized, interpreted, and evaluated. The individual will get meaning. Perception cannot be obtained without experience. A person needs to feel or experience first to bring up perception (Haatainen et al., 2021; Qiong, 2017). This is obtained from interaction with the environment.

The results of interviews conducted by researchers on 20 teachers showed a positive response to the use of Google Sites as a web-based learning media. In the interview, the researcher used six indicators that need to be considered when using Google Sites as a learning media. The first indicator that the researcher uses is the suitability of the media with the learning objectives. The teacher's perception of this indicator was that Google Sites can be developed according to the learning objectives. The teacher knew this after the author shows the Google Sites display that has been developed previously. These sites are very complete and developed under the learning objectives of each basic competency. For Google Sites to be used to support learning, it should follow the criteria that teachers should consider when selecting or using media. One of them is that the media chosen and used by the teacher must be under the learning objectives so that teaching and learning activities are more effective and students can understand the learning material (Marpanaji et al., 2018; Nurrita, 2018). The second indicator is the accuracy to support the content of lessons that consists of facts, concepts, principles, or generalizations. The use of media must be adjusted to the content of the learning. The teacher's perception of this indicator was that Google Sites as a learning media can support lesson content. Teachers believed that Google Sites can be integrated with animation, images, sound, and audio. Teachers can easily design website pages by inserting these four features so that students can freely learn from various media. To be able to help the learning process effectively, the media must be in harmony and in accordance with the needs of learning tasks and the mental abilities of students (Abdullah, 2012; Yulando et al., 2019). The third indicator is practicality, flexibility, and durability in its use. These criteria lead teachers to choose available media or easily made by the teacher themselves. The teacher thought that the use of Google Sites in the class is very practical and flexible because it can be used for all learning content of science. The flexibility of Google Sites makes students comfortable following learning. According to previous study students taking online classes are not only concerned with quality. Learners also want comfort and

flexibility (Mann & Henneberry, 2012). Another practicality of using Google Sites as a learning media is to be able to integrate Google Forms into it. Google Forms can be used as an assessment in the form of quizzes or exercises. To enter Google Forms, teachers only need to use the same Gmail account as Google Sites. Students can directly work on questions on the Google Sites website page that has been created by the teacher without having to move to a new tab in the browser. The fourth indicator is the teacher's skill in using Google Sites. Teachers must have skills in using Google Sites in classroom learning. The teacher's ability to use Google Sites must also be supported by the teacher's ability to use computers and the internet. In the teaching and learning process, a teacher should be skilled in choosing, using, and adjusting the media used (Karo-Karo & Rohani, 2018; Lusiyani & Dara Anindya, 2021). Based on the data obtained, teachers under the age of 40 were more proficient in using Google Sites. On the other hand, teachers over 40 have a hard time learning Google Sites at the start. However, after some practice, the teacher who initially had difficulty developing a website with Google Sites gradually became more proficient because the features on Google Sites were not too complicated and easy to use.

Learning media is not only sufficient with theoretical knowledge but also needs to be supported by doing a lot of exercises. Teachers need the desire to try, design, and use media, and also be able to develop these media. As teachers, they should also try to use modern electronic technology tools, and also try to design and use simple media that will be used in the learning process in the classroom. There are many types of learning media, and no one media is the best compared to other media because each media has its advantages and disadvantages. Teachers need to be familiar with the types of media with their respective characteristics so that teachers can choose and use media under basic competencies, learning experiences, and concepts that have been prepared by the teachers so that the learning process can be carried out properly. The target of using Google Sites is the independence of students in learning because basically, website-based learning fosters student learning independence (Haka et al., 2020; Khasanah & Lestari, 2021). Currently, all information is obtained from the internet. However, teachers need to organize the concepts provided so that students can learn sequentially. Of course, the teacher should provide additional information that is relevant to the concepts being studied so that students can better understand the concepts. If students do not understand the concepts, the teacher plays a role in explaining the concepts again. Students get many resources that can be discussed with the teacher. The problem now depends on the readiness of students to accept the learning process from other sources. There is a moderate and low influence of the use of website-based learning media on student learning outcomes. Websites can help student learning outcomes, especially in the cognitive domain (Bintaleb & Al Saaed, 2020; Rahayu et al., 2019). Cognitive learning outcomes are students' ability to learn a concept in school and are expressed in scores through test results to determine the level of success in learning achievement.

The sixth indicator is the perception of teachers in terms of technical quality. The teacher pointed out that the Google Sites display was very flexible. Teachers can easily modify the appearance of Google Sites at any time as needed. Students also easily access the features available on Google Sites. The navigation buttons are easy to understand and use. All teachers agree that using learning media can provide benefits to students. With learning media, the quality of learning increases because not only teachers are active in providing material to students but students can also be active in the classroom and involved in the learning process so that students more easily accept the subjects material presented by the teacher. The use of learning media can improve student learning outcomes. Several things can improve student learning outcomes with the existence of learning media. First, the teaching and learning process becomes easy and interesting. With the learning media, teachers can deliver learning materials to be interesting and easy to understand by students.

So that students can understand the lesson easily. Second, student learning efficiency can be increased. Students who learn by using the media will learn to be more efficient because it is following the learning objectives. The teacher gives the material more sequentially by giving the easier material first. Third, learning media helps students concentrate on learning. Learning media that is interesting and following the needs of students can help students concentrate on learning in the classroom. Students do not feel bored in the classroom in receiving the material given by the teacher. By displaying learning media, students become happy to learn well (Audie, 2019; Supriyatin et al., 2020). Fourth, the media can increase students' learning motivation. Learning media can increase students' learning motivation so that when teachers deliver material in class, students' attention to lessons can increase. Teachers can display learning media that attract students' attention before learning begins.

The use of Google Sites must also be maximized and all existing features are utilized as much as possible so that Google Sites becomes a learning media that can improve student learning outcomes. The Google Sites feature is very functional and really adapts to user needs. Of course this is a positive thing compared to putting a lot of features but rarely used. The features of Google Sites are: translate or translator, time management, calculator, search, file search, meeting schedule, public data, other Google products, and Drag and drop. Through the use of Google Sites, teachers can provide information about class news, upcoming activities, and announcements. Teachers can include photos and videos as attractive as possible so that students are interested in seeing them. Teachers can use Google Sites to upload assignment and portfolio forms. With Google Sites, it becomes easier for teachers to monitor students' homework. Not only assignments, teachers can complete student attendance and grades which can also be monitored by parents.

The implication of this study is providing overview related to the use of google sites for the benefit of the teaching and learning process in the classroom, Google Sites can be a means for teachers to communicate to parents of students regarding various learning progress or student documentation. Parents can visit students' google sites regularly to find out various information about their children's learning. This is a form of collaboration between teachers and parents in achieving shared learning goals.The limitation of this study lies on limited participant of this study, therefore for future study it is hoped can conduct similar study with more participant and can consider in evaluating the effectiveness of using the Google site for learning.

4. CONCLUSION

In general, teachers' perception of the use of Google Sites is very good. Teachers are open to following technological developments and want to try new things for educational innovation. After conducting FGD activities, teachers are committed to using Google Sites for the next semester to support web-based learning. The teacher has built Google Sites quite well, although there are still shortcomings in terms of document completeness. Over time, teacher-developed Google Sites will become better and can be used optimally in the classroom. This study will motivate writers, in particular, to provide long-term training for teachers on the topic of Google sites in the future, and readers who act as teachers to begin using Google sites as an option for presenting learning modules.

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