Implementing Google Sites to Improve Elementary School Students' Understanding of Science Concepts

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ABSTRACT
The lack of Students' comprehension of scientific topics science classrooms at Madrasah Ibtidaiyah possess underscoring the necessity for effective digital media. This study examines the application of Google Sites as a digital instrument designed to improve fifth-grade students' understanding of scientific ideas. The research utilizes a descriptive qualitative methodology, employing a case study approach that encompasses observation, interviews, and documentation. The informants and data sources for this research are fifth-grade students and teachers at one of the Madrasah Ibtidaiyah in Lhokseumawe city. The research results indicate that implementing the Google Sites learning media can improve students' understanding of science concepts. Students are more enthusiastic about learning, more active, and more responsive, making the learning process more conducive and improving the quality of student learning. Regarding the material on changes of state, students receive more support and have a more profound understanding of the topic presented. Research demonstrates that using Google Sites improves elementary school students' comprehension of science content. The improvement is evident from the students' average score, which increased to 84, 5 students achieving perfect scores (100), and most students score are getting above 80. Thus, the learning process becomes more active and meaningful for students. This research also makes a new contribution, which is the application of easy-to-use, creative, and interactive digital media, thus supporting the quality of science learning in elementary schools.

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INTRODUCTION

Mastery of the concept plays an important role in the science learning process because students can more easily understand the connections, principles, and events that naturally occur. By strengthening this understanding, students not only learn to memorize but are also able to apply it to determine solutions, answer questions, and draw conclusions based on existing facts. Additionally, students are also more independent, creative, and able to connect

the material learned in school with real-life situations around them. In this way, science learning becomes more meaningful, broad, and beneficial for students in the future. To make learning more meaningful for students, understanding concepts is crucial as a foundation for studying science, according to.[1]

Understanding is the foundation for students to be able to restate their existing knowledge in their language, making it easier to comprehend. This means being able to explain the understanding of concepts in depth through the material that has been studied, based on existing knowledge, making learning more meaningful.2 Weak conceptual understanding can make students cognitive skills difficult to develop to a higher level.3 Effective delivery of material by the teacher can make students' easier to understand the lesson. Typically, teachers use various diverse learning strategies to present the material that more engaging and interactive way.4 Therefore, MI students need to have a strong understanding of science concepts. Understanding is a higher level of thinking ability than mere recall or memorization.5

Based on the interview conducted on Wednesday, March 5, 2025, at MIN Lhokseumawe city, it appears that students are struggling to achieve the expected level of conceptual understanding. This is reflected in the students' test scores, which are mostly below the Minimum Passing Criteria set by the school, thus hindering and limiting the effectiveness of the science learning process. Additionally, this data is also supported by documentation data showing low conceptual understanding skills among students, as seen in Table 1.

Table 1. Score List of Fifth Grade MI Aceh, Lhokseumawe City

Class	Average Score	Number of Students	Minimum Passing Grade ≥ (75)	
			Pass	Fail
V A	75,33	25	9	16
V B	73,15	25	10	15
VC	71, 33	25	8	17

Source: Daily Test Scores of Grade V Students at Min Aceh School in Lhokseumawe City

Table 1 shows a list of average student scores of 5th grade MI Aceh in Lhokseumawe City based on daily test results. Fifth class A achieved an average score of 75.33 or 25 students, which 9 students were declared the Minimum Mastery Criteria of 75 and 16 students were declared not yet proficient. Meanwhile, the fifth-grade class B had an average score of 73.15. The students of class V B achieved an average score of 73.15 out of a total of 25 students, that included 10 students who are proficient and 15 students who are not yet proficient. Eight of them met the minimum passing grade, and 17 of them were not yet proficient. The data indicates that the majority of students in each class still require further

[1] 'Pengaruh Model Pembelajaran Poe Terhadap Kemampuan Pemahaman Konsep Ipa Siswa Sd | Novanto | Orbita: Jurnal Pendidikan Dan Ilmu Fisika', N.D., Accessed 15 March 2025, Https://Journal.Ummat.Ac.Id/Index.Php/Orbita/Article/View/4665.

[2] Ummi Rosyidah Et Al., 'Analisis Pemahaman Konsep Matematis Mahasiswa Program Studi Pendidikan Matematika Dalam Mata Kuliah Aljabar Dasar', *Linear: Journal Of Mathematics Education*, 23 June 2020, 46–56, Https://Doi.Org/10.32332/Linear.V1i1.2225.

[3] E. Sujarwanto Et Al., 'Kemampuan Pemecahan Masalah Fisika Pada Modeling Instruction Pada Siswa Sma Kelas Xi', *Jurnal Pendidikan Ipa Indonesia* 3, No. 1 (2014): 1, Https://Doi.Org/10.15294/Jpii.V3i1.2903.

[4] Linda Maulidina Et Al., 'Analisis Metode Pembelajaran Ipa Dalam Pembelajaran Jarak Jauh Saat Wabah Covid-19 Di Sekolah Dasar', *Khazanah Pendidikan* 15, No. 1 (2021): 42, Https://Doi.Org/10.30595/Jkp.V15i1.9838.

[5] Supitniar Hasanah, *Upaya Meningkatkan Pemahaman Tentang Perubahan Wujud Benda Menggunakan Model Student Teams Achievement Division (Stad) Pada Siswa Kelas V d Sdn 47/Iv Kota Jambi*, N.D.

guidance and support to achieve the established minimum passing grade. The table shows that most of the students got a score below the school's minimum passing grade. Based on, number of students evaluated, only 30% met the minimum passing grade, while the remaining 70% received scores below the expected standard. This means is that the way students learn needs to be changed so that they can better understand science information and get at least the minimum passing grade set by the school.

Therefore, teachers must facilitate students with media that can foster a high level of conceptual understanding.6 This will enable students to comprehend the material that are studying and make it simpler to engage in effective learning activities in the future.7 Then it will be easier to build more complex science abilities.8 Teachers play an important role in providing media that can foster a deeper understanding of concepts.9 One of them can deepen understanding of science concepts in elementary school. According to Wahyu, Google Sites is the easiest way to overcome concept understanding during the learning process,10 Direct learning necessitates the use of media, which enables students to learn anytime, anywhere, and track of the progress.11 In Google Sites, educators can present learning materials, assign tasks, and include syllabi and various other information. Additionally, Google Sites is very accessible to students; they only need a gadget or laptop connected to the internet.12 Students really need the media in learning process so they can improve their understanding of concepts.13 Thus, using Google Sites as a learning medium not only supports achieving learning objectives but also encourages students' independence and active involvement in the learning process.

Several prior studies have demonstrated that Google Sites is efficacious for learning across diverse subjects. However, there have been no studies that specifically evaluate its impact on understanding science concepts at the MI level. For instance, Islanda and Darmawan discovered that the use of Google Sites media can enhance student learning outcomes by fostering greater engagement, independence, and comprehension of the material presented.14 Additionally, Salsabila and Aslam's (2022) research aligns with this, as Google Sites media was deemed suitable and received very positive responses from both

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[6] Murgiyanti Murgiyanti, "'Pengembangan Media Pembelajaran Website Berbasis Google Sites Untuk Meningkatkan Kebhinekaan Global Anak Usia Dini Di Tk It Almawaddah Tahun Pelajaran 2022/2023'", *Jurnal Pendidikan Dan Ilmu Sosial (Jupendis)* 1, No. 2 (2023): 2, Https://Doi.Org/10.54066/Jupendis-Itb.V1i2.133.

[7] Ayu Putri Fajar et al., 'Analisis Kemampuan Pemahaman Konsep Matematis Siswa Kelas VIII SMP Negeri 17 Kendari', *Jurnal Pendidikan Matematika* 9, no. 2 (2019): 229, https://doi.org/10.36709/jpm.v9i2.5872.

[8] Suyit Ratno1 Et Al., 'Analisis Problematika Proses Pembelajaran Ipa Pada Siswa Kelas Vi Sdn 060912 Medan Denai', *Jurnal Hukum Motivasi Pendidikan Dan Bahasa* 2, No. 2 (2024): 2, Https://Ourhope.Biz.Id/Ojs/Index.Php/Jp/Article/View/9.

[9] Samsiar Rivai And Abdul Rahmat, 'Pelatihan Pembuatan Media Pembelajaran Matematika Untuk Pemahaman Konsep Dasar Matematika Bagi Mahasiswa Jurusan S1 Pendidikan Guru Sekolah Dasar', *Dikmas: Jurnal Pendidikan Masyarakat Dan Pengabdian* 3, No. 1 (2023): 1, Https://Doi.Org/10.37905/Dikmas.3.1.57-68.2023.

[10] Yuliana Wahyu Et Al., 'Problematika Pemanfaatan Media Pembelajaran Ipa Di Sekolah Dasar', *Jurnal Penelitian Pendidikan Ipa* 6, No. 1 (2020): 107–12, Https://Doi.Org/10.29303/Jppipa.V6i1.344.

[11] Eri Murniasih Kep Amd Et Al., *101 Tips Belajar Efektif Dan Menyenangkan* (Alprin, 2020).

[12] Reza Rachmadtullah Et Al., *Monograf Pembelajaran Interaktif Dengan Metaverse* (Cv.Eureka Media Aksara, 2022).

[13] Fatmawati Fatmawati Et Al., 'Media Pembelajaran Audio Visual: Literature Review', *Pionir: Jurnal Pendidikan* 10, No. 1 (2021), Https://Doi.Org/10.22373/Pjp.V10i1.9748.

[14] Ela Islanda And Deni Darmawan, *Pengembangan Google Sites Sebagai Media Pembelajaran Untuk Meningkatkan Prestasi Belajar Siswa*, 27 (2023).

students and teachers.[15] Meanwhile, Wicaksono et al. the use of Google Sites showed greater benefits for both students and teachers, which helped improve digital literacy. Another related study by Putra provides more detail about the development process, specifically using the DDD-E model, and states that the media meets the feasibility standards set by experts.[16] Additionally, Adzkiya and Suryaman placed more emphasis on the English language learning process, where students felt more comfortable and motivated to learn by utilizing Google Sites.[17] The similarities with previous research, they lie in the use of Google Sites as a substitute for books, while the differences are in the materials and research methods used.

The purpose and focus of this research is to analyze the implementation of using Google Sites media on students' conceptual understanding abilities in science subjects at Madrasah Ibtidaiyah in Lhokseumawe City. Unlike previous studies that generally only highlighted the overall effectiveness of digital media on improving learning outcomes (e.g., in low-level cognitive aspects), this study aims to fill the gap in deeper conceptual understanding, such students' ability among concept in the context of science learning. The success of implementing Google Sites media in this study is measured by the extent to which students are able to re-explain the information they received using their own words without losing its meaning, as stated by Fajar et al.18 Additionally, this research aims to identify supporting and hindering factors in the use of Google Sites media so that the results can serve as a bridge for further research examining the relationship between digital technology integration and the sustainable improvement of conceptual understanding at the primary education level.19

This research also provides academic and practical contributions regarding the use of Google Sites media, which is expected to be useful for teachers, researchers, and education practitioners. Thus, the application of this media can be a creative and relevant solution to the problem of low student understanding, while also improving students' technological and collaborative skills, making the learning process more meaningful, active, and capable of achieving the desired goals.[20]

RESEARCH METHOD

This research utilizes a qualitative methodology to elucidate the use of Google Sites as a pedagogical tool in Madrasah Ibtidaiyah, particularly in enhancing students' conceptual comprehension.[21] The type of research applied is Yin's case study, an approach suitable for exploring phenomena occurring contextually in the field and obtaining detailed information regarding the process and results of implementing the media.

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[15] Fadillah Salsabila And Aslam Aslam, 'Pengembangan Media Pembelajaran Berbasis Web Google Sites Pada Pembelajaran Ipa Sekolah Dasar', *Jurnal Basicedu* 6, No. 4 (2022): 6088–96, Https://Doi.Org/10.31004/Basicedu.V6i4.3155.

[16] Vicky Dwi Wicaksono Et Al., 'Google Sites As Ict Learning In Indonesia: The Benefits And Implementation', *Kne Social Sciences*, Ahead Of Print, 10 May 2023, Https://Doi.Org/10.18502/Kss.V8i8.13303.

[17] Dilla Safira Adzkiya And Maman Suryaman, 'Penggunaan Media Pembelajaran Google Site Dalam Pembelajaran Bahasa Inggris Kelas V Sd', *Educate : Jurnal Teknologi Pendidikan* 6, No. 2 (2021): 20, Https://Doi.Org/10.32832/Educate.V6i2.4891.

[18] Fajar et al., 'Analisis Kemampuan Pemahaman Konsep Matematis Siswa Kelas VIII SMP Negeri 17 Kendari'.

[19] Mariana Jediut Et Al., 'Manfaat Media Pembelajaran Digital Dalam Meningkatkan Motivasi Belajar Siswa Sd Selama Pandemi Covid-19', *Jurnal Literasi Pendidikan Dasar* 2, No. 2 (2021): 2.

[20] Syailin Nichla Choirin Attalina Et Al., 'Tingkatkan Kemampuan Literasi Digital Guru Sd Dalam Penggunaan Media Pembelajaran', *Khaira Ummah* 1, No. 02 (2022): 02, Https://Doi.Org/10.34001/Khairaummah.01022022-8.

[21] Creswell 2018, *Research Design: Qualitative, Quantitative, And Mixed Methods Approaches*, N.D.

The study was conducted in an elementary school in Lhokseumawe, Aceh, during the second semester of the 2024/2025 academic year. The study involved a group of 25 students, including 17 females and 8 men, from class 5A. The implementation of this initiative was facilitated by their science teachers, Ibu Nurul and Ibu Intan, who incorporated Google Sites into their instructional methods. Additionally, Ibu Irma acted as the tertiary informant, while students identified by the initials K, K, G, and A were included because of their significant involvement with Google Sites in their academic activities.

This research uses three methods for data collection: observation, interviews, and documentation. Data collection was carried out through non-participant structured observation, which is a planned and detailed observation process of student interactions during learning, according to predetermined aspects and time.[22] Additionally, structured interviews were conducted with science teachers to gather more comprehensive information regarding the use of learning media, from the preparation process to implementation and evaluation. Structured interviews were chosen because the researcher already had a clear idea of what information they were keen to explore.

Data analysis in this study uses the model from Miles, Huberman, and Saldaña, which consists of three main stages: data condensation, data presentation, and conclusion drawing/verification. According to Miles et al., these three stages—data condensation, data presentation, and conclusion drawing/verification—are interconnected processes before, during, and after data collection, forming a common domain called analysis. Data analysis in qualitative research is conducted both during and after the data collection process.[23] The validity of the data was tested using data from interviews, observations, and documentation.[24]

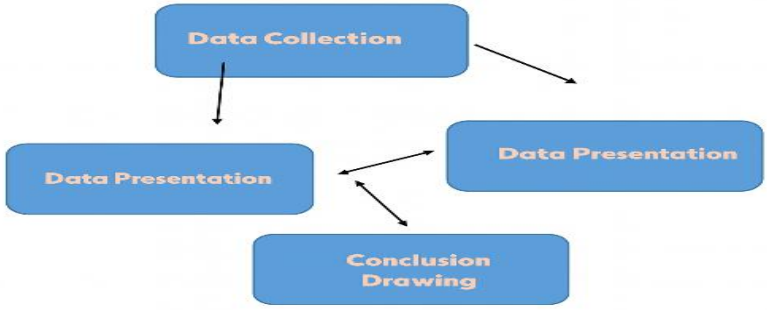

Figure 1. Qualitative Data Analysis Techniques
Source: Miles, Huberman, & Saldana, 2014

RESULTS AND DISCUSSION

Based on the results of interviews, observations, and documentation, the data analysis process was carried out in three stages: data reduction, data presentation, and drawing conclusions. In the data reduction process all data based on observations and interviews regarding the science learning process before and after the implementation of Google Sites media were selected and grouped. Data that was unrelated to the research issue was discarded. Data demonstrating improvements in students' learning behavior, activity, and capacity to comprehend what they were learning were saved for future research. The decreasing results demonstrated a significant difference in how well students absorbed science knowledge before and after Google Sites media was included. Thematic analysis

[22] Sugiyono;, *E-Book Metode Penelitian Kuantitatif, Kualitatif, Dan Rd* (Alfabeta, 2013), Bandung, //Elibrary.Stikesghsby.Ac.Id%2findex.Php%3fp%3dshow_Detail%26id%3d1879%26keywords%3d.

[23] Matthew B. Miles Et Al., *Qualitative Data Analysis: A Methods Sourcebook*, Edition 3 (Sage, 2014).

[24] Dedi Susanto Et Al., 'Teknik Pemeriksaan Keabsahan Data Dalam Penelitian Ilmiah', *Qosim : Jurnal Pendidikan Sosial & Humaniora* 1, No. 1 (2023): 1, Https://Doi.Org/10.61104/Jq.V1i1.60.

Thematic analysis revealed numerous major themes that explain changes in the learning process, including:

Theme 1: Improving Student Access and Engagement Before Using Google Sites.

Students only access materials and assignments through Google Classroom without the support of interactive media like videos or quizzes. This makes students difficult to understand the relationships among concepts, then they are unable to provide examples or non-examples of the material they are learning. After implementing Google Sites, students can access learning videos, read materials, understand learning objectives, and take quizzes directly within a single platform. This condition increases students' active participation and engagement in learning activities.

Theme 2: Conceptual Understanding Enhancement

The observation results indicate that after using Google Sites, students were able to re-explain the concepts they had learned in their own words, as Fajar et al. (2019) stated that conceptual understanding is reflected in students' ability to re-articulate information without changing its meaning. Video-based learning activities and interactive quizzes facilitate students in connecting one concept with another more concretely.

Theme 3: Improving Motivation and Learning Activities

Surveyed teachers and students stated that Google Sites makes learning more engaging and student-centered. Teenagers are more likely to complete school assignments when they can do them alone or with other people. This tool makes teachers' work easier and allows them to quickly assess students' progress. This is done by displaying test scores and the results of various learning exercises.

The results of this study show that using Google Sites films for teaching science increases students' interest in the subject and helps them understand it better. The idea of student-centered learning aligns with the idea of Outcomes-Based Education (OBE), which is entirely dedicated to what contributes to learning. Google Sites allows students to learn by doing, interact with digital content, and think critically about what they are studying.

These findings support earlier studies that showed interactive media-based instruction can improve learning outcomes and student engagement. However, this study makes a novel contribution in the context of elementary madrasahs, specifically regarding the use of Google Sites as an integrated medium that facilitates conceptual understanding, not just knowledge transfer.

The science learning process appears different after the implementation of Google Sites media compared to before its use. Previously, students only used the digital media Google Classroom to review assignments; there were no videos to watch, which made it difficult for students to provide examples and non-examples of the material being studied. Additionally, students struggled to comprehend the material they were learning, which hindered their ability to draw conclusions or review it.25 However, after using Google Sites media, students were able to learn by watching learning videos, reviewing materials, understanding learning objectives, and taking quizzes directly using Google Sites. This feature allowed students to be directly involved in solving problems in understanding the lesson material, making learning activities more active and enthusiastic throughout the learning process.

[25] Puan Aisyah Maharani Et Al., 'Pengembangan Media Pembelajaran Interaktif Berbantuan Google Sites Untuk Meningkatkan Hasil Belajar Siswa Pada Materi Momentum Dan Impuls', *Jurnal Penelitian Pembelajaran Fisika* 15, No. 1 (2024): 31–42, Https://Doi.Org/10.26877/Jp2f.V15i1.17458.

Figure 2. Google Sites Homepage View by Humaira Silfiani
https://sites.google.com/view/materi-perubahan-wujud?usp=sharing

As shown in Figure 2, the main page view of Google Sites that was developed by Humaira Silfiani is displayed. accessible via the link https://sites.google.com/view/materi-perubahan-wujud?usp=sharing. The page presents material on changes of state in matter in a detailed, easy-to-understand, and engaging manner, allowing students to learn more independently, actively, and enjoyably, in line with the expected learning objectives.

Essentially, media should provide effectiveness during the learning process. Effective learning is characterized by its emphasis on empowering learning resources and students to actively master knowledge about what is being taught. This aligns with the viewpoint of Dewi et al., who argue that learning is enhanced when students participate in hands-on experiences, independently discover knowledge, and apply it in their daily lives. The success of student learning is assessed through their responses to the questionnaire, which is based on seven indicators of conceptual understanding.

Thus, utilizing Google Sites as a learning medium is a solution to make it easier for teachers to teach, serving as an effort to improve students' learning quality, learning motivation, learning creativity, and concept understanding in elementary school/Islamic elementary school subjects.26 Google Sites is the easiest way to overcome concept understanding during the learning process, and direct learning requires media that helps students learn anywhere without time constraints. This aligns with the opinion of teacher V, Ibu Nurul, who stated:[27]

> "Therefore, personally, I feel very helped by the existence of Google Sites. What I like most is that I can store all my learning administration there. From lesson plans and teaching materials to assessments, everything can be neatly organized in one place and easily accessed at any time. Therefore, there's no need to carry thick folders everyplace anymore; just open it on your phone or laptop, and students are also directly involved with the media used.".

The interview results show that teachers find it easy and effective to use Google Sites to manage the learning process. This aligns with Kounin's Theory of Classroom Management, which emphasizes that successful classroom management occurs when teachers can prevent problems before they arise, keep students active and engaged, and thus maximize the learning process.[28] This notion is in line with the opinion of Jubaidah & Zulkarnain, who emphasize the importance of teachers' skills in keeping the learning process

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[26] Fatmawati Fatmawati Et Al., 'Media Pembelajaran Audio Visual: Literature Review', *Pionir: Jurnal Pendidikan* 10, No. 1 (2021), Https://Doi.Org/10.22373/Pjp.V10i1.9748.

[27] Hasil Wawancara Bersama Guru Kelas V Ibu Nurul

[28] Isfauzi Hadi Nugroho, 'Integrasi Manajemen Kelas Dan Kontrol Kedisiplinan Untuk Mengubah Perilaku Siswa Yang Tidak Produktif', *Al-Hikmah : Journal Of Education And Islamic Studies* 6, No. 2 (2019): 2.

running smoothly and actively involving students.[29] The use of Google Sites as a learning medium can support this, namely maintaining learning momentum, focusing students' attention, and preventing classroom problems. With a more attractive and accessible interface, Google Sites helps teachers manage the learning process, making students more active, engaged, and better able to understand the material presented.

Based on the presentation above, it can be concluded that the advantages of Google Sites media are (1) it helps teachers and students in a more engaging learning process, (2) teachers can provide learning materials and assignments and include syllabi and student worksheets (LKPD), and (3) it encourages students to be more active in learning and makes learning less monotonous because it is presented in the form of text, images, and videos, with a single link covering everything, (4) It makes abstract (non-concrete) material more concrete, (5) It is easy to access, so students only need a gadget or laptop connected to the internet.

Benefits of Implementing Google Sites Media

Some of Google Sites' benefits for education are that it is free, simple, easy to use, and has lessons that are easy for anyone to understand. Google Sites also makes evaluation easier because it works with Google Forms, which can quickly summarize test or task results. Other benefits of Google websites include being free to use and integrating easily with other Google services like Google Drive and Google Docs. These make it easier to handle educational materials and talk to teachers and students. Content for Google Sites can include audio recordings, videos, and Google Forms to collect information from students.[30] This means that Google Sites allows for the easy display of various interactive educational resources.

Figure 3. Students Accessing Google Sites Media on Computer/Laptop

Figure 3 shows students accessing the Google Sites learning media using a computer or laptop in the classroom. During the activity, students actively and independently sought information, studied the material, and completed the exercises presented on the Google Sites platform. The use of digital media not only makes the learning process more interactive but also provides students with the convenience to learn according to their individual needs and pace. Therefore, the adoption of Google Sites is anticipated to enhance students' motivation to study and their comprehension of the subject matter.

[29] Siti Jubaidah And M. Rizki Zulkarnain, 'Penggunaan Google Sites Pada Pembelajaran Matematika Materi Pola Bilangan Smp Kelas Viii Smpn 1 Astambul', *Lentera: Jurnal Ilmiah Kependidikan* 15, No. 2 (2020): 68–73, Https://Doi.Org/10.33654/Jpl.V15i2.1183.

[30] Muhammad Ainur Rizqi And Subanji Subanji, 'Analisis Praktek Pembelajaran Daring Persamaan Garis Lurus Berbantuan Media Geogebra Melalui Google Sites', *Aksioma : Jurnal Matematika Dan Pendidikan Matematika* 12, No. 1 (2021): 141–54, Https://Doi.Org/10.26877/Aks.V12i1.7621.

We implement Google Sites media by combining face-to-face and digital-based learning through a Google Sites link. This is supported by the results of the interview interaction with Ibu Nurul, the class teacher, which stated:[31]

> "Learning using Google Sites media is being done for the first time in the school. Previously, I had not utilized this medium in class; instead, I relied on Google Classroom, YouTube, or traditional textbook reading. I noticed that this media really captured the students' attention. They practiced focusing by watching the provided videos, and they could see the material being studied directly with the examples in the learning videos. Additionally, the students could play quizzes, which made the learning process interesting and fun as they experienced accessing this media on their own laptops for the first time."

The interview results indicate that the use of Google Sites is the first experience implemented in the school. Previously, the learning process more frequently utilized Google Classroom, watched videos on YouTube, and read textbooks. The implementation of Google Sites media aligns with the innovation learning theory (Rogers), which states that the adoption process must occur for an innovation to be implemented. This means that educators and students must be open to accepting and trying new things considered more beneficial. In this case, the Google Sites media delivers a more engaging, inventive, and enjoyable learning environment. This, in turn, increases students' motivation, participation, and ability to study independently, allowing them to meet their own needs.[32] The benefits of using Google Sites media for a more relevant and engaging learning experience for students are shown by their more enthusiastic responses during the learning process, their increased involvement in seeking information, and their ability to finish assigned tasks. This conclusion is supported by the results of an interview with student Anisa, who stated:[33]

> "Our school is one of two MI schools in Lhokseumawe City, Aceh, who are making their first venture into digital media this year, 2023. Learning with Google Sites is enjoyable; however, teachers sometimes struggle to find and prepare suitable and varied materials because we are more accustomed to using books. But, certainly, studying using Google Sites is more pleasant and encourages us to actively seek knowledge and learn independently.".

The interview findings offered by the students show that the deployment of Google Sites media is a fresh and interesting learning experience for them, albeit teachers still struggle to identify and create appropriate content. Students are also more motivated, engaged, and self-sufficient when studying, therefore employing Google Sites media can help facilitate a more meaningful and student-centered learning experience. It fits with Mezirow's transformative learning theory, which says that learning happens when teachers and students can think about, question, and change the ways they think based on the situation they are in. When students use Google Sites media, they change. They become more open, active, and independent, which makes learning more important and able to meet the needs of each student. Although teachers still face challenges, the use of this technology encourages students to be more motivated and engaged, aligning with the transformative vision expressed by Mezirow.[34]

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[31] Result of an interview with Teacher 'Nurul'.

[32] Dini Putri Haryanto, 'Inovasi Pembelajaran', *Perspektif Ilmu Pendidikan* 16, No. Viii (2007): 259537, Https://Doi.Org/10.21009/Pip.162.11.

[33] Result of an interview with Students 'Anisa'.

[34] Ari Maulana, 'Transformasi Pembinaan Akhlak Generasi Z Melalui Program Ngaji Sambil Ngopi (Ngaspi) Di Kupi Nanggroe Banda Aceh' (Masters, Universitas Islam Negeri Ar-Raniry Banda Aceh, 2025), Https://Repository.Ar-Raniry.Ac.Id/Id/Eprint/41883/.

The transformation of learning from books to digital requires an adaptation process, so teachers need more time, skills, and mature support to be able to implement it.[35] The lack of training on technology use is also a barrier for educators, causing anxiety for teachers when they have to adapt to digital-based media. This conclusion is supported by the results of interviews with Ibu Nurul, a fifth-grade teacher, who stated that implementing digital media is a significant challenge, especially regarding their skills and readiness to optimize the technology to support students' learning processes.[36]

> "Often, teachers experience anxiety and discomfort when faced with using digital-based learning media, especially because they have long been accustomed to teaching with traditional methods using books and blackboards. This condition creates an unusual obstacle in the process of adapting to the increasingly rapid developments in educational technology. As a teacher, I hope the government would provide comprehensive and long-lasting training programs in addition to new technology. This program is essential for preparing teachers to develop and implement interesting, tech-driven teaching materials, especially more seasoned teachers who may not be as adept with digital technologies. Teachers are required to be able to advance their digital competency with sufficient assistance in order to stay current and give students more interesting and relevant learning experiences".

The interview results highlight the importance of a transformative process. This process requires teachers to think critically about and respond to change, which ultimately enhances the learning experience and better meets the needs of students. According to Mezirow's 1991 approach, teachers need to adapt to digital learning environments to maintain the relevance and effectiveness of their teaching methods for their students.[37] This change increases teacher relevance, promotes lecture quality, and elevates engagement and learning efficacy. According to Donald and colleagues 2006, the shift from traditional print materials to digital platforms represents a transformation characterized by changes in pedagogical attitudes, technological infrastructure, and essential skills, thereby fostering engagement, innovation, and self-direction among students and teachers in the field of education.[38]

Technology has two functions such a tool and a medium. It helps students acquire new knowledge, solve challenges, and personalize their learning experiences, thereby enhancing their ability to achieve their academic goals.[39] Trainers face many challenges in the digital age. The list includes changes in roles and required competencies, differences in how technology is used, curriculum and teaching methods, and ethical and digital safety issues. There have also been significant changes in assessment and examination methods. To maintain effective learning, teachers need to adapt to technological advancements.

Implementation of Google Sites Media in Digital Class V

The continuity of the learning process in the classroom using Google Sites media runs smoothly and is structured and systematic as expected. It began with explaining how to use the Google Sites media, followed by watching a 7-minute video. Then, students viewed the material in the material column to be read for 5 minutes. After that, the teacher provided

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[35] Hendra Et Al., *Media Pembelajaran Berbasis Digital (Teori & Praktik)* (Pt. Sonpedia Publishing Indonesia, 2023).

[36] Result of an interview with Teacher 'Nurul'.

[37] Feliks Rejeki Sotani Zebua, "Analisis Tantangan Dan Peluang Guru Di Era Digital," *Jurnal Informatika Dan Teknologi Pendidikan* 3, no. 1 (2023): 21–28, https://doi.org/10.25008/jitp.v3i1.55.

[38] Andrian Haro dkk., *Buku Ajar Komunikasi Digital* (PT. Sonpedia Publishing Indonesia, 2024).

[39] Ndaru Kukuh Masgumelar And Pinton Setya Mustafa, 'Teori Belajar Konstruktivisme Dan Implikasinya Dalam Pendidikan Dan Pembelajaran', *Ghaitsa : Islamic Education Journal* 2, No. 1 (2021): 1, Https://Doi.Org/10.62159/Ghaitsa.V2i1.188.

reflections or leading questions about important points from the lesson topic that were seen in the video and the material provided in the Google Sites column feature.

Figure 4. Explaining the Rules and Procedures for Using Google Sites Media

Figure 4 shows the teacher's activities while explaining the rules and procedures for using the Google Sites media to students in class V. During this process, the teacher provided detailed and easy-to-understand instructions on the step-by-step use of the Google Sites media so that students could access the materials, videos, and questions available on the platform. Learning is implemented using Google Sites media through a link shared by the classroom teacher via the class WhatsApp group. Students then access the link and are directly connected to the Google Sites access page for science material on the properties and changes of matter. The learning link is ready for students to use at any time. The explanation provided also aims to ensure that students are able to learn independently and actively and become more engaged so that the learning process runs more optimally and according to the expected goals. Teachers implement Google Sites media by explaining its use. This procedure is done so that students do not have difficulty understanding what features are provided on the feature column page. For a teacher, it's common to start by providing reinforcement before using media so that students are not confused during the learning process. The present instance is the first time I've used this media in class; I've never used it before in science lessons. This is supported by the results of an interview with Nurul's homeroom teacher, who stated that:[40]

> "This Google Sites media represents a new finding that I have not previously used in class. I see that implementing this media provides students with a high level of academic experience in learning with the technological advancements of today's modern era. Additionally, I also feel that this medium can help teachers deliver material in a tangible way because students can see directly what will be learned today, one link covers all the components being studied, and this medium can be accessed anytime, both at home and at school. This is a unique advantage for students, especially those who were absent, as they can see the material learned today without fear of falling behind".

Based on the interview, it indicates that the application of Google Sites media is able to support a more interactive, independent, and student-needs-based learning process in the current technological era. This aligns with Rogers' theory of innovation diffusion, which states that the adoption of an innovation occurs when there is an adoption process, meaning that students and teachers are open, able to learn, and adapt to the technology being implemented, allowing the learning process to run more optimally and meaningfully.[41]

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[40] Hasil Wawancara Bersama Ibu Nurul Kelas V.

[41] Warman Warman Et Al., 'Peran Kepala Sekolah Sebagai Inovator Dalam Meningkatkan Kinerja Guru Di Smp Negeri Kota Samarinda: Sebuah Studi Kualitatif', *Jurnal Ilmu Manajemen Dan Pendidikan* 4, No. 2 (2024): 135–46, Https://Doi.Org/10.30872/Jimpian.V4i2.4312.

Evaluation the Usage of Google Sites Media

Evaluating the usage of Google Sites may be accomplished by taking into consideration a variety of elements, including its efficiency, its user-friendliness, its design, and its influence on learning or the objectives that are wanted. Both in-person and online, the instructor stated that the utilization of multimedia medium in educational settings is both effective and fascinating. The students responded with a great deal of enthusiasm throughout the sessions that made use of Google Sites, which is particularly noteworthy given that they had never before employed this platform for educational purposes in the classroom. This assumption is supported by the findings of the interview that were provided by Mrs. Intan, who is the teacher of the fifth grade:[42]

> "This media is capable of realistically measuring students' conceptual understanding abilities, as students can complete the quiz questions provided in the Google Sites feature. This product serves as a solution for teachers to see how well students understand the material they have learned. Usually, to evaluate lessons, teachers have to assign homework, but with this media, teachers don't need to provide homework because this media already has quizzes that can be answered directly in class independently".

Based on the interview results presented by the 5th-grade teacher, Mrs. Intan, it is confirmed that the implementation of Google Sites media is able to support a more practical, independent, and student-needs-based learning evaluation process, thus providing faster feedback on students' mastery of the material. This aligns with Vygotsky's 1978 constructivist theory, which states that the learning process occurs when students are given the opportunity to be active, independent, and directly involved in learning, enabling them to better construct their knowledge and skills.[43]

The common evaluation method used by teachers is usually a one-sheet paper where students answer quizzes manually. This procedure is very time-consuming during the learning process. Since the target audience is a fifth-grade class, which is already a digital class, teachers need to develop progress that aligns with technology, keeping pace with more advanced, practical, and modern learning developments.[44] This evaluation aims to assess the extent to which students understand the concepts in the material they have learned and are able to recall them from what they have studied. This assessment is supported by the results of an interview with teacher Nurul, who stated:[45]

> "After using Google Sites as a learning medium, I observed an improvement in students' understanding and interest in learning, especially in science subjects. Most students became more enthusiastic because the material was presented interactively and could be accessed anytime. This has a positive impact on their learning outcomes. The students' average score after using Google Sites increased compared to before. In fact, there are some students whose grades were previously below the minimum passing score but are now able to achieve satisfactory grades. In my opinion, this medium is very helpful in bridging students' learning needs in the digital age, like today".

According to the findings of the interview that were offered by Mrs. Nurul, the teacher of the fifth grade, the Google Sites platform is able to test the students' level of

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[42] Result of an interview with Teacher 'Intan'.

[43] Suharni Suddin dkk., *Sejarah Sosial* (CV. Gita Lentera, 2025).

[44] Jessica Sandi Mariana Situmorang And Nani Mediatati, 'Efektivitas Plickers Sebagai Media Evaluasi Ppkn Untuk Mengurangi Perilaku Menyontek Siswa Smk Negeri 2 Salatiga', *Cetta: Jurnal Ilmu Pendidikan* 6, No. 2 (2023): 2, Https://Doi.Org/10.37329/Cetta.V6i2.2521.

[45] Result of an interview with Teacher 'Nurul'.

comprehension in a genuine manner by means of the quiz questions that are provided. Due of this, teachers are able to assess their students' level of comprehension of the topic without having to assign homework. Additionally, students are able to independently take the quizzes while they are in class. According to Piaget's constructivist theory, which places an emphasis on the significance of independent and active learning processes, in which pupils are given the chance to develop their own knowledge and abilities, this is consistent with the theory.[46]

The findings from interviews with multiple students support this assertion, indicating that they experienced increased motivation to learn due to the enjoyable and straightforward nature of the content presented through Google Sites. A student expressed a preference for learning science through this medium due to its provision of visuals, films, and practice questions that facilitate independent completion at home. Other students reported increased confidence in their assignment work due to the ability to study the content on Google Sites as needed. The finding is reinforced by observations made during the learning process, which show that students participated more actively in debates and produced better work. Interviews with Ghina's students suggested that:[47]

> "Using Google Sites provides a more enjoyable and less boring learning experience. My friends and I found it easier to understand the material because of the visual displays, learning videos, and interactive quizzes embedded in the site. They also revealed that the flexibility to access materials anytime made them more independent in their learning."

Based on the interview results presented by student Ghina, she emphasized that Google Sites provides a more enjoyable and less boring learning experience. Students also found it easier to understand the material because of the visual displays, learning videos, and interactive quizzes embedded within the site. This aligns with the theory presented by Rogers 2003 regarding the process of innovation adoption, which is the application of technology that can meet students' needs, increase learning motivation, and support independent learning processes, making learning more meaningful and relevant to the times.[48]

Therefore, utilizing Google Sites as a teaching tool not only makes studying more engaging and pleasant, but also encourages students to be more independent in how they grasp the information. The available interactive features enhance independent understanding and foster a flexible learning environment that accommodates the needs of students in the digital age. Alfiansyah found that observations of the learning environment showed an increase in students' active engagement in class discussions and the completion of given activities.[49] Therefore, using Google Sites has shown to be a useful tool for establishing a more inclusive and adaptable learning environment, which is essential for meeting the demands of today's digital learners.

An evaluation was conducted to assess students' cognitive achievement in science learning, specifically concerning Properties and Changes of Matter, based on the results of a multiple-choice test across three primary domains: Knowledge (C1), Understanding (C2), and Application (C3). The evaluation instrument consists of 10 questions, each worth 10

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[46] Zihniatul Ulya, 'Penerapan Teori Konstruktivisme Menurut Jean Piaget Dan Teori Neuroscience Dalam Pendidikan / Application Of Constructivism Theory According To Jean Piaget And Neuroscience Theory In Education', *Al-Mudarris: Journal Of Education* 7, No. 1 (2024): 1, Https://Doi.Org/10.32478/Vg1nnv56.

[47] Result of an interview with Teacher 'Ghina'.

[48] Jusman Jusman dan Ashari Usman, "Peran Teknologi Pendidikan Dalam Meningkatkan Kualitas Pembelajaran Di Era Digital: Sebuah Studi Literatur," *Jurnal Pendidikan Multidisiplin* 1, no. 1 (2025): 1–10, https://doi.org/10.54297/jpmd.v1i1.879.

[49] Gamasiano Alfiansyah dkk., "Ketidaklengkapan Pengisian Informed Consent di Rumah Sakit," *Jenggala : Jurnal Riset Pengembangan dan Pelayanan Kesehatan* 3, no. 2 (2024): 39–48.

points, resulting in a maximum possible score of 100 if all answers are correct.[50] The students' final scores obtained after participating in Google Sites-based learning reflect their final ability to understand the material, as presented in Table 3 below.

Based on the research results in Class V, it is known that the scores obtained by 25 respondents after using Google Sites media showed quite satisfactory results. The highest score achieved was 100, while the lowest score was 50. The total overall score is 2,060, resulting in an average score of 84. It can be seen that the learning outcomes of the fifth-grade students improved after using the Google Sites learning media. Previously, the students' average score was lower, but after being given treatment using this media, the average score increased to 84. This study proves that using Google Sites truly helps to improve students' conceptual understanding abilities.

This means that by using this medium, students' understanding of the subject matter also becomes better. This report shows the value of each student after participating in learning using Google Sites media. It appears that most students achieved fairly high scores, with the distribution ranging from 50 to 100. A total of 5 students successfully achieved a perfect score of 100, indicating an improvement in understanding after using the learning media. Although one student scored the lowest with 50, the overall distribution of scores shows a positive trend, with many students falling within the 80 to 90 range. This indicates that Google Sites media plays a role in supporting the achievement of satisfactory learning outcomes.

Advantages and Disadvantages of Google Sites Media

Google Sites has several benefits for educational settings. It's free, which is always a plus, and it's really easy to use. The layout is straightforward, and the classes are designed to be user-friendly. According to Habibah, it is possible to create a Google site for a class in a very short period of time. This is possible since templates are available for different pages, and no significant technical skills are needed.[51] According to Shinta Widyasari et al., Google Sites can be filled with materials such as videos, audio recordings, or Google Forms as feedback from students.[52] Additionally, there is a feature called an embed code that can display GeoGebra applications developed by teachers. Furthermore, Google Sites has many intriguing advantages to learn about, as follows: Google Sites is free and easy to create, users can collaborate in its use, it offers 100 MB of free web storage, Google's search engine can search or track students, and users can customize the appearance of Google Sites as attractively as possible. This argument is supported by the opinion of the 5th-grade teacher, Mrs. Irma:[53]

> "Because of its accessibility and user-friendliness, this Google Sites media platform may be extremely beneficial to both teachers and students. Teachers claim that by keeping pupils interested via dynamic exchanges, this arrangement fosters their love of learning. It encourages a thorough, immersive, and modern educational experience in the classroom by keeping up with the advancement of new technology. Duplicating the files is not required because the educational materials are easily

[50] Ardiansyah Et Al., 'Teknik Pengumpulan Data Dan Instrumen Penelitian Ilmiah Pendidikan Pada Pendekatan Kualitatif Dan Kuantitatif', *Ihsan : Jurnal Pendidikan Islam* 1, No. 2 (2023): 2, Https://Doi.Org/10.61104/Ihsan.V1i2.57.

[51] Ni'mah Nur Habibah, 'Pengembangan Media Pembelajaran Berbasis Literasi Sains Berbantuan Google Sites Pada Materi Sumber Energi' (Bachelorthesis, Jakarta: Fitk Uin Syarif Hidayatullah Jakarta, 2024), Https://Repository.Uinjkt.Ac.Id/Dspace/Handle/123456789/82685.

[52] Shinta Widyasari Et Al., 'Kemampuan Literasi Matematika Melalui Model Pembelajaran Problem Based Learning Dengan Bantuan Google Sites Kelas Xi', *Proximal: Jurnal Penelitian Matematika Dan Pendidikan Matematika* 7, No. 2 (2024): 534–42, Https://Doi.Org/10.30605/Proximal.V7i2.3569.

[53] Result of an interview with Teacher 'Irma'.

> accessible on the Google Sites page. As a result, neither teachers nor students are now required to utilize USB devices, which makes it easier for them to access educational resources".

Based on the interview results presented by the fifth-grade teacher, Mrs. Irma emphasized that using Google Sites media provides significant ease and benefits, namely making the learning process more interesting, modern, and easily accessible, thus motivating students and helping them focus more on theivaluablees. Teachers are also more supported because they no longer need a flash drive to share teaching materials. This supports Smaldino, Lowther, and Russell's theory that technology-based learning tools, like Google Sites, can improve students' motivation, engagement, and learning processes by increasing their level of activity, independence, and ease of access to learning resources based on their own needs.54

Ext, the researcher conducted interviews and observations with several students. The results of these interviews are as follows. Researchers conducted interviews with students who said:[55]

> "With this media, learning becomes more interesting because there are videos, material summaries, and quizzes. Besides, you can see the available material without having to open a book first; everything is already on this Google Sites media. Therefore, it's easier to learn with such sophisticated media. Learning with this media makes it easier to understand the material, especially with the direct viewing of images and videos".

Based on the interview results shared by Kifa's students, using Google Sites makes the learning process more interesting, easy, and enjoyable. Students are more helped because they can learn through videos, material summaries, and quizzes that are available, so students no longer need to search for textbooks but can simply access one complete and easy-to-understand medium. This aligns with Dale's theory of the cone of experience, which states that the learning process is more meaningful and easier to understand when students are actively involved and learn from more concrete experiences, such as watching videos, looking at pictures, and participating in interactive activities. By combining visual media, text, and practice questions, Google Sites can provide a more complete learning experience, making it easier for students to absorb and connect the information they receive.[56]

The advantages of Google Sites media are that it helps teachers and students in a more engaging learning process. Teachers can provide learning materials and assignments, including syllabi and student worksheets (LKPD). It encourages students to be more active in learning, and learning becomes less monotonous because it is presented in the form of text, images, and videos, with a single link covering everything. It makes abstract (non-concrete) material more concrete. It is easy to access, so students only need a gadget or laptop connected to the internet. This aligns with Vygotsky's constructivist theory, which states that the learning process is more meaningful when students are actively involved, given opportunities to seek, discover, and construct their own knowledge, with appropriate media and learning resource support.[57]

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[54] Aisyah Ali Et Al., *Media Pembelajaran Interaktif : Teori Komprehensif Dan Pengembangan Media Pembelajaran Interaktif Di Sekolah Dasar* (Pt. Sonpedia Publishing Indonesia, 2024).

[55] Result of an interview with Student 'Kifa'.

[56] Awalul Khasanah And Muhammad Fahmi, 'Efektivitas Teori Kerucut Pengalaman Terhadap Peningkatan Hasil Belajar Pendidikan Agama Islam', *Proceedings Of Annual Islamic Conference For Learning And Management* 1 (December 2024): 150–70.

[57] Nurdyansyah Nurdyansyah And Eni Fariyatul Fahyuni, *Inovasi Model Pembelajaran Sesuai Kurikulum 2013*, With Nurdyansyah Nurdyansyah And Eni Fariyatul Fahyuni (Nizamia Learning Center, 2016), Http://Eprints.Umsida.Ac.Id/296/.

Every novelty in implementation naturally has its obstacles. The challenges of implementing this media include situations where the power goes out, preventing students from using digital media and forcing them to rely on books instead. This situation makes students bored and unmotivated to study, which aligns with Akbar's opinion.[58] Additionally, there is concern that if the Wi-Fi data limit is exceeded, connecting to Google Sites will not be possible. Moreover, poor Wi-Fi connectivity is a significant obstacle for teachers using this medium. This point is supported by the opinion of the 5th-grade teacher, Mrs. Nurul:[59]

> "The fundamental obstacle when using Google Sites media is a poor internet connection preventing access to the Google Sites link. This is certainly a major obstacle for teachers in teaching in digital classrooms, especially since students in digital classrooms rarely use books, let alone bring them. The only possible anticipation is not studying due to poor network connectivity. This scenario is certainly detrimental to students, as they should be going to school to gain knowledge, but their learning is delayed, and they are not studying at all in school".

This aligns with the opinion of Khalis's students, who stated:[60]

> "Digital media is limited due to poor network connectivity, which hinders the learning process. Slow Wi-Fi and inaccessible links during study times significantly disrupt our learning when the network is unreliable." Additionally, there are varying levels of understanding the material; some grasp it quickly when using digital media, while others struggle to use digital media when opening it because they are not yet accustomed to using a laptop. And there's an impact that makes people lazy about reading books because digital classes rarely use books when learning".

According to discussions to the student Khalis and fifth-grade instructor Ibu Nurul, the learning process was hampered by the usage of Google Sites media because of inconsistent internet access and a range of student competence levels. Dependency on digital media can also make children less likely to read books, so it's important to find solutions and provide direction to make sure technology keeps improving student learning. This is in line with Rogers' 2003 thesis, which holds that in order to optimize the use of technology in assisting students' learning processes, it is necessary to provide solutions and assistance that address challenges related to infrastructure, skills, and student acceptability.61

Both good and bad effects are highlighted in the aforementioned viewpoints on the limitations of utilizing Google Sites for digital material. The positive impact of using this media is that learning becomes simple and efficient.[62] Students can easily and conveniently learn the subject matter, and they can also keep up with the rapidly developing technology. Meanwhile, the negative impact is that students are becoming less and less close to reading books because all the material is provided on laptops. This makes students too lazy to read textbooks because they have become reliant on fast and easy media.

The following pie chart presents the proportional comparison between the number of advantages and disadvantages in using Google Sites as a learning medium in an educational setting.Data shows that the advantage aspect reaches 67%, while the disadvantages are only 33%.This indicates that Google Sites generally contributes more to improving the

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[58] Jakub Saddam Akbar Et Al., *Penerapan Media Pembelajaran Era Digital* (Pt. Sonpedia Publishing Indonesia, 2023).

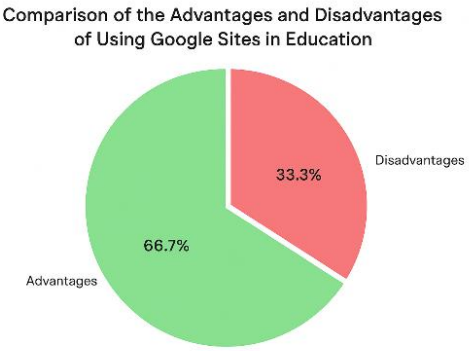
[59] Result of an interview with Teacher 'Nurul'..

[60] Result of an interview with student 'Khalis'.

[61] Loso Judijanto dkk., *Transformasi Pendidikan: Menghadapi Era Digital di Ruang Belajar* (PT. Sonpedia Publishing Indonesia, 2025).

[62] Wastriami Wastriami And Adam Mudinillah, 'Manfaat Media Pembelajaran Berbasis Aplikasi Kinemaster Terhadap Hasil Belajar Ipa Siswa Sdn 25 Tambangan', *Tarqiyatuna: Jurnal Pendidikan Agama Islam Dan Madrasah Ibtidaiyah* 1, No. 1 (2022): 30–43, Https://Doi.Org/10.36769/Tarqiyatuna.V1i1.195.

effectiveness of the learning process.The most significant benefits are the ability to give students with knowledge that is both dynamic and fascinating, as well as the ease of access and flexibility within the presentation of information. However, there are still a great deal of technical issues that need to be overcome, such as the access to the internet, the limitations of the devices, and the level of digital proficiency possessed by the teachers. Given this, it is clear that even while Google Sites has a great deal of promise as a tool to promote digital learning, its deployment still requires the assistance of technical professionals and training in order to guarantee that all individuals participating in the educational process are able to make the most of it:



Graph 2. Comparison of the Advantages and Disadvantages of Using Google Sites

Thus, it can be concluded that using Google Sites as a learning medium offers more advantages than challenges.According to Febrian & Nasution, Google Sites is a useful alternative digital media in the current learning era because of its benefits, which include simplicity of use, interactive capabilities, and the capacity to deliver content in an interesting and comprehensive way.[63] However, in order for the use of this medium to function as efficiently and fairly as possible for every student, some limitations, including restricted internet access and reliance on electronic devices, still need to be addressed and solutions developed.

Teachers' Perceptions of Changes in Student Understanding

Teachers have a good view of using Google Sites-based learning media to assess how well students grasp science subject. Teachers observed that pupils tended to understand the fundamental concepts of the lesson more rapidly after utilizing this medium. Before Google Sites, many students could just remember material without fully understanding it. In contrast, students showed deeper and longer-lasting understanding when they learned using interactive and visual methods. The students' increasing participation in class discussions, together with their ability to explain scientific principles in their own words, clearly showed their growth. Mrs.Nurul's interview results support this conclusion. She said.:[64]

> "In the application of this medium, it can be seen that learning becomes more efficient because students have already read and understood the material before face-to-face learning takes place. With the inclusion of images, videos, and short quizzes in Google Sites, students not only read but also experience meaningful learning. Even students who were previously passive began to show interest and courage to ask

[63] M. Agil Febrian And Muhammad Irwan Padli Nasution, 'Efektivitas Penggunaan Google Sites Sebagai Media Pembelajaran Kolaboratif: Perspektif Teoritis Dan Praktis', *Al-I'tibar : Jurnal Pendidikan Islam* 11, No. 2 (2024): 152–59, Https://Doi.Org/10.30599/Jpia.V11i2.3590.

[64] Result of an interview with Teacher 'Nurul'.

questions. As a teacher, I interpret this change as a sign that the use of digital media can improve students' understanding and self-confidence.".

In the course of the conversation with Ibu Nurul, a teacher of fifth grade, it was discovered that the use of Google Sites in the classroom results in learning that is both more efficient and more pertinent. This results in students being more engaged, feeling more confident in their ability to absorb the material, and believing that it is easier to do so, all of which contribute to an improved learning experience. The findings of this study provide credence to Dale's 1969 theory, which proposes that the utilization of instructional technologies that include students in an active manner and offer significant learning experiences has the potential to enhance both the quality of student learning and the consequences of that learning.[65]

The improvements seen in students' understanding and confidence align with Mayer's multimedia learning theory. This theory suggests that using visual and auditory elements in digital media enhances learning, which in turn boosts student engagement and motivation.[66] Constructivism suggests that digital media allows students to actively participate in creating knowledge through interactive experiences. This, in turn, builds their confidence in using what they've learned. Utilizing digital media in the classroom enhances students' comprehension and fosters essential cognitive skills that contribute to academic success, such as self-efficacy.

CONCLUSION

This research shows that using Google Sites media in science learning at Madrasah Ibtidaiyah can significantly improve students' conceptual understanding abilities. This online media offers a unified learning environment that encompasses learning objectives, resources, videos, and assessments on a single platform, enhancing engagement, interactivity, and student focus in the learning process. Students become more active in finding relationships among the concepts and more easily to understand the material through contextual learning experiences. Nevertheless, this study has limitations of subject scope and relatively short implementation duration, so it does not fully capture the long-term impact of using Google Sites on learning outcomes. In addition, there are other issues related to the the execution of field deployments, specifically in connection to the digital competency of instructors and the availability of the infrastructure that is necessary.

For future research, it is advised that the Google Sites platform be examined for its performance in diverse areas, that both long-term and numerical methodologies be applied, and that a bigger sample size be utilized. To facilitate the implementation of Outcome-Based Education (OBE) and the development of students' capabilities for the 21st century, the inclusion of a variety of interactive components ought to be given the highest priority in the production of this medium.

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[66] Sella Mawarni And Ali Muhtadi, 'Pengembangan Digital Book Interaktif Mata Kuliah Pengembangan Multimedia Pembelajaran Interaktif Untuk Mahasiswa Teknologi Pendidikan', *Jurnal Inovasi Teknologi Pendidikan* 4, No. 1 (2017): 84, Https://Doi.Org/10.21831/Jitp.V4i1.10114.

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