Vol. 10, No. 3, 2024, pp. 632-640
DOI: https://doi.org/10.29210/020243964

Contents lists available at Journal IICET

JPPI (Jurnal Penelitian Pendidikan Indonesia)
ISSN: 2502-8103 (Print) ISSN: 2477-8524 (Electronic)

Journal homepage: https://jurnal.iicet.org/index.php/jppi

Effectiveness of using google sites-based learning media to improve critical and creative thinking abilities of vocational school students

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Article Info

Article history:

Received May 03rd, 2024
Revised Jun 12th, 2024
Accepted Jul 10th, 2024

Keyword:

Creative,
Critical thinking,
Education,
Google sites,
Learning media

ABSTRACT

Critical thinking and creative thinking are the main components and important components related to 21st-century skills. Technology is currently very advanced in learning media, so learning is becoming easier and less boring for students. This is supported by global demands that force the education sector to align technical progress with efforts to improve educational standards. One of the sciences and technologies that can be utilized is interactive learning media based on Google Sites. This research was conducted to see the increase in students' ability to think critically and creatively after using Google Sites as a learning media. The research was conducted at the Accounting Department Vocational School in Madiun Regency and Madiun City, East Java. Data collection was carried out by observing critical and creative thinking skills in class, as well as filling out a questionnaire about Google site-based learning media. The research results show that using Google Sites as a learning media for students can improve students' critical and creative thinking abilities. Students' assessments of Google Sites learning media meet the criteria of being very eligible in all aspects. Google Sites can help teachers provide learning resources for students that will help them understand their lessons and activities better.

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Introduction

Education is the formation of a dignified national character and civilization in order to make the nation's life more intelligent. Education is very important for the future of the nation; as the nation's successor, you must have good educational provisions. The right to obtain education can be had by all levels of society as stated in the 1945 Constitution, Chapter XIII, article 31 after amendments regarding education and culture. By learning a lot, everyone will gain broader insight into developing their personal qualities (Pubian et al., 2023; Gesy et al., 2022). The quality of learning is very important for educational progress. Several aspects that determine quality are learning outcomes and interest in learning. Meanwhile, the factors that influence learning outcomes are internal factors and external factors. Internal factors include interest and motivation. Interest in learning is an internal factor that determines the success of learning, but in fact, students' interest in learning is still relatively low based on observations made by teachers (Fauhah & Rosy, 2020).

Based on the results of observations by Basori & Jufri (2024), researchers suspect that the cause of the problem of low interest in learning and low learning outcomes is inappropriate learning methods or models. The method

used by the teacher is a lecture method, which causes the teacher to dominate learning. Learning media that is less interactive is also a contributing factor to low interest in learning. This is in line with the research results by Roberts (2019), which stated that student interest decreased when they were not present in the control group, which was tested using the lecture learning method. With good interest in learning, it is hoped that students will be more enthusiastic in participating in learning so that their learning outcomes will be better. The main components and important components related to 21st-century skills are critical thinking, creative thinking, communication and collaboration (Abidin & Tohir, 2019) Critical thinking is a high-level thinking ability based on strong beliefs to conclude facts rationally and objectively (Gesy et al., 2022). Meanwhile, the ability to think creatively is an individual's actions when analyzing and looking for alternative solutions when thinking about various responses that can be solved (Silvanus & Ridwan, 2022). Of course, quality and effective learning will be carried out if there are adequate supporting factors for learning, such as the existence of learning tools that are systematically arranged starting from preparation for learning management, preparing teaching materials or materials, and learning assessment evaluation tools to determine how much knowledge and skills students have absorbed (Maharani & Kartini, 2019). Learning media are tools that can assist learning activities so that learning objectives can be achieved effectively and efficiently (Wulandari et al., 2023). This is done so that the process of delivering the material can be well received by students as well as to increase enthusiasm and motivation for digital learning (Churiyah et al. 2020).

Technology is currently very advanced in learning media, so learning has become easier and less boring for students (Mulyaningsih et al., 2023). This is supported by global demands that force the education sector to align technical progress with efforts to improve educational standards, especially in terms of changing the way information and communication technology are used in learning activities (Rizqi & Subanji, 2021) The use of technology makes learning more active and fun (Ramadia et al. 2023; Handayani et al., 2022). With the development of technology, science and technology-assisted learning models will become more effective because learning will become more varied (Jusra & Nuranggraeni, 2023). The development of technology, which is evenly distributed and increasingly widespread in every field of life, including education, forces all educators to follow the pace of technological development (Sadikin & Hakim, 2019). The use of appropriate technology in education can make it easier to obtain complete sources, information flows all the time without knowing the time and place, students' learning activities and abilities increase, learning can be standardized, and the quality and quantity of learning outcomes increase (Rizqi & Subanji, 2021).

The use of appropriate learning media is what determines the success of learning. Learning media is divided into several types that can be adapted to learning conditions and situations (Wulandari et al., 2023). One of the sciences and technologies that can be utilized is interactive learning media based on Google Sites (Jusra & Nuranggraeni, 2023). Google Sites is an e-learning platform, which is a form of Google product that can be used to create websites. Its benefits are that it is an internet-based digitalization media tool for creating creative content that can be used as a site. The use of the digitalization era, such as Google sites, can be managed by educators in teaching learning using a learning management system to students (Jusra & Nuranggraeni, 2023; Silvanus and Ridwan 2022). According to Rikani et al., (2021), Google Sites is a Learning Management System (LMS) offered by Google for e-learning-based learning media. In the field of education, Google Site learning media can create various kinds of learning activities, such as making it easier to convey the content of lesson topics, assignments, presentation of the syllabus, and so on. The form of delivering material to students can be through writing, pictures, illustrations, video playback, and so on. Google sites can provide a variety of independent learning even when students are not in class, thereby allowing students to manage their knowledge more broadly and develop (Gesy et al., 2022). Therefore, hope for the use of technology as a support for teaching and learning in the classroom has emerged among educators (Basuki & Ummah, 2020).

Critical and creative thinking skills are needed to develop students' learning potential. The facts show that students' critical and creative thinking abilities still need to improve. Based on these problems, the researcher will provide a solution by developing a teaching material product in the form of Google Site-based learning media for vocational school students majoring in Accounting in Madiun Regency and Madiun City, East Java, Indonesia. Because of current technological developments, Google Sites is suitable for use as a learning medium in implementing the learning process for vocational school students. The advantage of this research compared to previous studies is that this learning media is based on Google Sites with the aim that vocational school students can improve their critical and creative thinking skills and can provide varied learning through Google Sites learning media, which is equipped with several features with interesting and complete extensions. The use of Google Sites-based learning media can develop students' critical and creative thinking skills and become an innovation in the development of teaching materials.

Method

This research was conducted from January 2024 to February 2024. The research was conducted at the Accounting Department Vocational School in Madiun Regency and Madiun City, East Java. Data collection was carried out by observing critical and creative thinking skills in class, as well as filling out a questionnaire about Google site-based learning media. Observations are carried out directly in the class with the aim of finding out and getting information from the students. The questionnaire carried out in this research aims to obtain primary data, namely sources related to the effectiveness of using Google Sites-based learning media in Accounting Vocational Schools in Madiun Regency and Madiun City, East Java. To do this, start by asking a list of questions that have been created based on the problems in the research. Then, a questionnaire was distributed to 188 students with a list of questions. So, you will get complete data information. The following are the research methods used:

Observation
Direct observation of learning activities is carried out at the observation stage to obtain initial data regarding learning conditions, including learning models, infrastructure, and existing obstacles. The observation method applied is participant observation, where the researcher is actively involved in the learning process as an observer. Observations also focus on student activities using the learning media developed to strengthen information and identify potential obstacles in the field.

Interview
Interviews were conducted directly with students in individual face-to-face meetings. At the same time, colleagues served as written interview samples to gain views on the teaching and learning process in the classroom. Interview grids are extracted from the Teacher Performance Assessment (PKG) instrument to ensure the relevance and accuracy of the data obtained.

Questionnaire
At the initial observation stage, questionnaires were given to colleagues, while at the product evaluation stage, questionnaires were given to material experts and the media. In addition, a questionnaire for students is used to assess their response to the learning media developed. The type of questionnaire used is a closed questionnaire, where respondents choose the answers provided by the researcher, making it easier to analyze the data obtained. With a combination of observation, interviews, and questionnaire methods, this research ensures comprehensive data collection to support learning analysis and learning media design. The research population is:

1 class XII from SMKN 2 Jiwan for limited trials of 30 students
4 class XII from SMKN 2 Jiwa for testing the media developed by 126 students
1 class XII from SMKN 1 Geger for testing the media developed by 32 students
1 class XII from SMKN 2 Madiun for testing media developed by 30 students

The instrument used in this research was a rating scale. Rating Scale or Assessment Scale is a type of data collection instrument used to measure an object or variable based on the respondent's subjective assessment. The rating scale allows respondents to provide an assessment of the items in the instrument on a certain scale. The scale used is a Likert scale with a rating range of 1-5. The Likert scale is one of the most common types of scale used in research, primarily because it can be used to measure a subject's level of agreement or disagreement with a statement. The Likert scale is a measurement method used to measure a person's opinion using a questionnaire to determine the attitude scale towards a particular object. The survey was carried out using a questionnaire. The questionnaire model used is in the form of a rating scale, which is relatively easy to make, and respondents are also easy to respond to. Instruments with this scale are a form that researchers often use to carry out measurements.

In this research, a Likert scale model was used. The weights or scores given to this statement are strongly agreed (SS) with a value of 5, agree (S) with a value of 4, disagree (KS) with a value of 3, disagree (TS) with a value of 2, and strongly disagree (STS) with a value of 1. This approach was chosen by researchers for the following reasons: Research subjects are individuals who have the best knowledge about themselves. The information provided by subjects to researchers is considered accurate and reliable. The subject's interpretation of the statement given is in accordance with what the researcher intended. After receiving the respondent's answers, the scores will be totalled and calculated using the following formula:

Total score = T x Pn

Index (%) = Total score / Y x 100

Information:
T: Total respondents
Pn: Total Likert score options

Y is calculated using the formula:

Y = Highest Likert score x number of respondents

Before completing the Likert results, we must know the interval (distance range) and percent interpretation in order to know the assessment using the method of finding the percent score interval (I). Interval Formula:

With I = 100/5 = 20 (20 is the distance interval from the lowest 0% to the highest 100%). Table 1 show the scores by interval.

Table 1. Likert scale results with interval analysis

Index (%)	Qualification	Equivalent
0 – 20	Very Invalid	Very Eligible
21 – 40	Invalid	Eligible
41 – 60	Fairly Valid	Fairly Eligible
61 – 80	Valid	Not Eligible
81 – 100	Very Valid	Totally Not Eligible

Results and Discussions

Google Sites is a platform that teachers can use to create interactive learning content that is easily accessible to students. This makes it easier for students to read what they need to broaden their knowledge and study at home. Google Sites makes it easier for students to study teaching materials and update learning data on certain subject websites. One of the services or features offered by Google is the ability to create websites for free, which allows teachers and students to collaborate in creating effective learning media content (Wardhani and Zaini 2023). Google sites can be used as complex learning media, including audio, visuals, videos, reading texts, and questions related to learning material. Multimedia is a combination of text, sound, image, animation, video, and interactive content (Sugiyani et al., 2014). In other words, multimedia consists of the use of computers to display and combine images, animation, text, sound, and video, along with the tools and connections that enable people to create, interact, and communicate with each other.

All these websites are connected through links to the Google website. According to research by Nuryati et al., (2022) the use of web-based learning media provides better results for students. This is also in line with research by Wulandari et al. (2022), which states that the use of interactive multimedia as a learning support can improve student learning outcomes. Google Sites learning media has the advantage of providing flexibility for students to understand learning material, increasing student independence so that students can manage their knowledge and learn at their own pace. This media was developed to help students develop the ability to master concepts and think critically through direct experience because they not only listen to explanations from the teacher but students also carry out other activities such as observing videos and pictures and carrying out simulations. Table 2 shows the percentage of students in critical thinking after using Google Sites learning media.

Table 2. Percentage Scale for Critical Thinking Students Using Google Sites.

Criteria	Day-1	Day- 2	Day- 3
Very Competent	5 %	7 %	7 %
Competent	85 %	87 %	92 %
Fairly Competent	10 %	6 %	1 %

The effectiveness test in Table 2 was carried out to see the extent to which students' critical thinking abilities increased after using Google Sites in learning. On the first day, the results showed that the number of very competent students was 5%, competent students were 85%, and fairly competent students were 10%. Then, on the second day, there was an increase in very competent and competent students, namely 7% and 87%, respectively, while fairly competent students decreased to 6%. Moreover, on the third day, the number of competent students increased to 92%, while the number of fairly competent students decreased to 1%. These results indicate that the use of Google Sites as a learning media for students can improve students' critical thinking skills.

Based on the data obtained in Table 2, the learning media that has been developed using Google Sites is effectively used to improve students' critical thinking skills. This is in line with research by Nurmanita (2022), which states that using Google Sites as a learning medium can improve critical thinking skills because it makes it easier for someone to learn and increases a person's thinking ability to be the focus when educators deliver the material. In agreement with this, the results of Sevtia et al. research (2022) stated that the use of learning media makes it easier to study and analyze the material contained on Google Sites so that a person's thinking ability is more focused. Other research conducted by Sridhara and Raghunandan (2019) also shows that using Google Sites can make a person's thinking critical because it requires someone to understand the use of e-learning media that is integrated with Google applications.

Nurlatifah and Suprihatiningrum (2023) explained the importance of learning media involvement in training students to think critically when solving existing problems. Based on the explanation from Gessy et al. (2022), the Google Site learning media can help increase students' level of critical thinking so that students are able to make the right decisions regarding all the complexities of existing problems. Meanwhile, Nur (2021) stated that the lack of use of learning media has an impact on weakening student enthusiasm and feeling bored, and the ongoing learning process becomes passive. Modern learning must be innovative, interactive, and able to improve students' basic competencies. Several characteristics of an independent curriculum that must be considered are the concept of learning at the right level, differentiated learning consequences (students learn according to their style and abilities), integration of materials, competencies, and activities to increase student creativity and critical thinking (Fanani et al., 2022). For this reason, learning media is needed that can attract students' attention and foster interest in reading. As a learning aid, Google Sites is expected to help explain abstract concepts, increase absorption capacity and provide direct experience in learning so that it can improve students' mastery of concepts and critical thinking.

Apart from being able to think critically, other skills that students must develop in learning are creative thinking skills (Nasution et al., 2023; Sukmawati et al., 2017; Van et al., 2017). Creative thinking skills are very important for students in solving problems that arise with logical reasoning and appropriate solutions (Wulansari et al., 2023). Creative thinking skills involve cognitive processes that will contribute to the emergence of creative ideas or innovative actions (Patrício et al., 2018). Creative thinking skills are also related to novelty, the ability to create something, being creative in applying new forms, creating imaginative skills, or innovating to add something that already exists into something more useful and of high value (Greenstein, 2012). Furthermore, Collard and Looney (2014) stated that creative thinking skills are very important for every student to develop because, with creative thinking skills, a person can solve the problems and challenges they face. Research by Siburian et al. (2019) shows that creative thinking skills have a positive correlation with cognitive learning outcomes. Wannapiroon and Pimdee (2022) stated that creative thinking skills can be developed through classroom learning activities. By improving creative thinking skills, it is hoped that students will come up with new ideas, insights, approaches, points of view, and ways of understanding various things and have many ways and ideas to solve problems from various points of view. Table 3 shows the percentage of students in creative thinking after using Google Sites learning media.

Table 3. Percentage Scale for Creative Students Using Google Sites

Criteria	Day-1	Day- 2	Day- 3
Very Competent	5 %	5 %	6 %
Competent	92 %	93 %	94 %
Fairly Competent	3 %	2 %	0 %

The effectiveness test in Table 3 was carried out to see the extent to which students' ability to think creatively increased after using Google Sites in learning. The first day showed that the number of very competent students was 5%, competent students were 92%, and fairly competent students were 3%. Then, on the second day, there was an increase in competent students, namely to 93%, while very competent students remained at 5% and fairly competent students decreased to 2%. Moreover, on the third day, the number of competent students increased to 94%, while fairly competent students decreased to 0%, and very competent students increased to 6%. These

results indicate that the use of Google Sites as a learning media for students can improve students' creative thinking abilities. This is in line with research by Ratnawati et al. (2023), who found that Google Sites can improve students' creative thinking abilities.

Next, teaching materials, including storyboards, are designed to direct product development. The development stage includes creating media, such as editing image designs, slides, learning materials, videos, exercises, and quizzes on the Google site so that it becomes a complete product. The display of website media development results is shown in Figure 1.

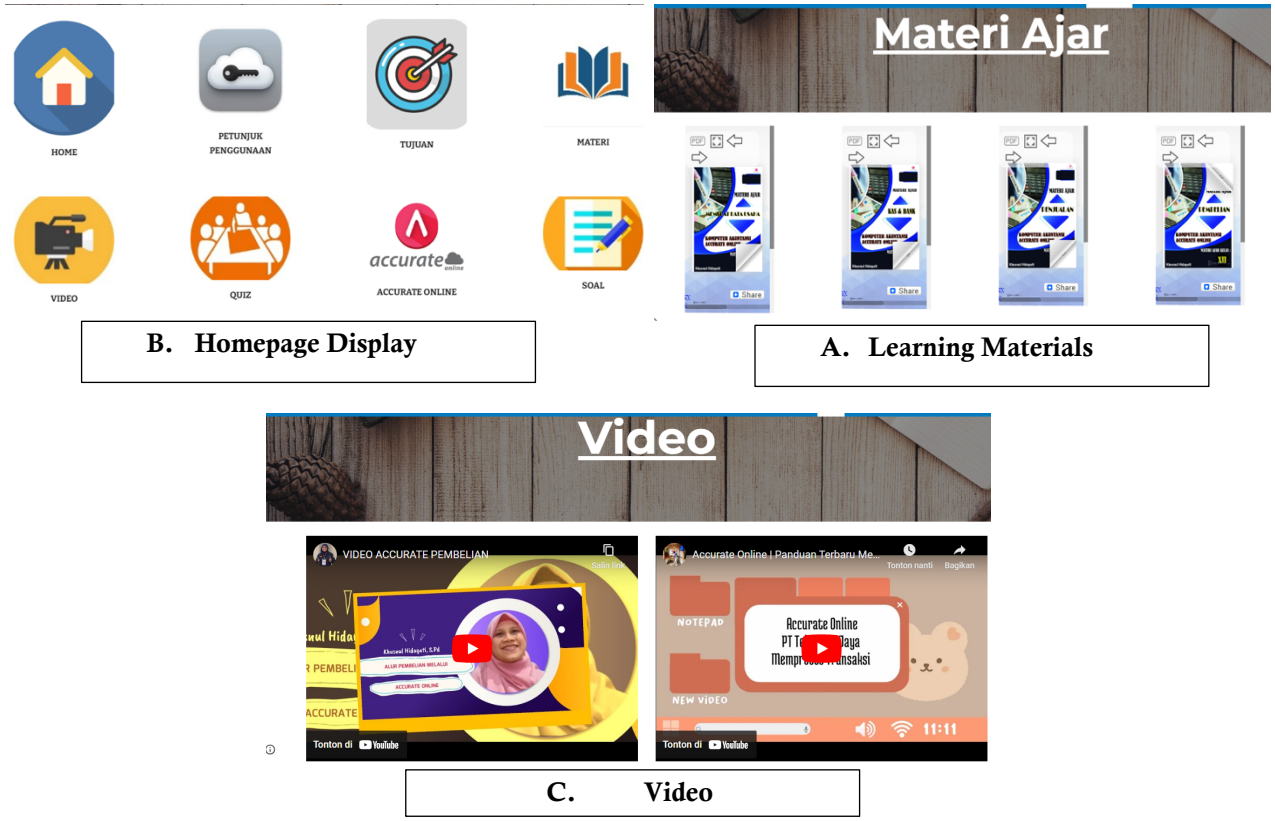

Figure 1. Display of Website Media

The learning media in this study is web-based and developed from the Google site, so internet access is required. This learning media has been assessed for suitability. Table 4 shows the results of the recapitulation of students' assessments of Google Sites learning media. The research results show that the Google site learning media has very eligible criteria in all aspects. The presentation received the lowest score, namely 89.81%. Meanwhile, the highest score is in language use, with a score of 93.85%.

Table 4. Recapitulation of Student Assessment of Google Sites Learning Media

No	Aspect	Rating Scale				
		∑ni	∑N	100%	Value	Criteria
1.	Material	2949	3192	100%	92.38%	Very Eligible
2.	Presentation	2867	3192	100%	89.81%	Very Eligible
3.	Languages	1498	1596	100%	93.85%	Very Eligible
4.	Benefits	2466	2660	100%	92.70%	Very Eligible
Total Score		9780	10640	100%	91.91%	Very Eligible

Based on Table 4, it can be seen that the students' assessment of Google Sites learning media meets the criteria of being very eligible in all aspects, namely the material aspect with a score of 92.38%, the presentation aspect with a score of 89.81%, the language aspect with a score of 93.85%, and the benefits aspect with a score of 91.91%. It can be concluded that the 188 student respondents felt that the Google Sites learning site was useful and helpful in understanding their learning. The results of this research also support Roodt and de Villiers' (2012) claim that Google Sites has a significant positive impact on students because most of them consider the use of

the online platform as an innovative learning tool. Thus, Google Sites' learning media is very feasible and acceptable to students. Learning materials using Google Sites can help teachers provide contextual and localized learning resources to students, which will help students understand their lessons and activities better so that they can improve their critical and creative thinking skills.

These results align with research by Dewi et al. (2023), which states that the results of the material feasibility test by material experts obtained an overall proportion of 87.4% of the five assessment indicators. With the composition, the suitability of the material with learning outcomes is 87%, Material Accuracy is 90%, Encourage Curiosity is 100%, Language is 80%, and User-Friendly Is 80%. So, website-based learning media is included in the criteria for being very suitable for use. Furthermore, Aziza & Baroroh (2024) stated that Google Sites-based learning media was considered appropriate by material experts, with an average value of 3.79, and very relevant according to media experts, with an average value of 4.44. Media validation is carried out by material experts and media experts using an assessment sheet that refers to product suitability criteria. Data analysis is carried out at this stage to determine the effectiveness of learning media.

Today's rapid advances in science and technology have brought and continue to bring changes in all sectors of daily life. One is in the education sector as one of the most critical institutions directly and indirectly affected by these changes. Information and communication technologies (ICT) fundamentally contribute to the improvement and effectiveness of education, which has always been at the center of social change because it influences, directs, and naturally conveys knowledge. This is in line with the statement of Guan et al. (2018), which states that the education sector is experiencing a transformation with the presence of Information and Communication Technology (ICT) involving the use of hardware and software to collect, process, store, presenting and sharing information mostly in digital form. New technology, as a term for social media networks, internet services, and new applications and media, has significantly contributed to the field of education by improving learning. The quality of education has always been a critical issue internationally; evaluations and proposals continue to be carried out, and new ways of supporting learning continue to be sought. Education must constantly innovate in using facilities and differentiate didactic process methods to ensure the quality of education meets the criteria for each level and discipline (Nicolaou et al., 2019)

Education in the current generation approaches information in diverse and innovative ways. Therefore, the learning environment must adapt to their skills, needs, and knowledge to be more effective. Based on Balakrishnan & Gan (2016), students learn more and better while watching video material, handle more than one screen simultaneously, prefer interactivity, and are active on social media. Therefore, one-way teaching makes them less interested in procedures. Then, using learning media such as Google Sites can provide new experiences and support digital learning. For future research, efforts should be made to explore technology with several multimedia components to improve the teaching and learning process in various groups of students in primary, secondary, vocational upper, and tertiary or university educational institutions. Research efforts like this will significantly increase inclusiveness and narrow educational gaps. In addition, research on change management processes to overcome barriers to multimedia adoption is also of interest.

Conclusions

Based on research, the use of Google Sites learning media increases students' critical and creative thinking abilities. This can be seen from the results of the effectiveness test, which resulted in an increase in students' critical thinking abilities after using Google Sites to learn. The same results occurred in tests of the effectiveness of students' increased ability to think creatively. Students' assessments of Google Sites learning media meet the criteria of being very eligible in all aspects. Learning materials using Google Sites can help teachers provide learning resources for students that will help them understand their lessons and activities better.

References

Abidin, Z., & Tohir, M. (2019). Keterampilan berpikir tingkat tinggi dalam memecahkan deret aritmatika dua dimensi berdasarkan taksonomi bloom. *Alifmatika: Jurnal Pendidikan Dan Pembelajaran Matematika*, *1*(1), 44–60. doi:10.35316/alifmatika.2019.v1i1.44-60

Aziza, A., & Baroroh, K. (2024). Development of google sites-based social science learning media to increase students' critical thinking ability. *International Journal of Multidisciplinary Research and Analysis*, *07*(05). doi:10.47191/ijmra/v7-i05-12

Balakrishnan, V., & Gan, C. L. (2016). Students' learning styles and their effects on the use of social media technology for learning. *Telematics and Informatics*, *33*(3), 808–821. doi:10.1016/j.tele.2015.12.004

Basori, B., & Jufri, S. (2024). Increasing Learning Interest and Learning Competency Using Google Sites-Based Problem-Based Learning (pp. 410–416). doi:10.2991/978-2-38476-198-2_56

Basuk, A., & Ummah, U. S. (2020). Developing interactive android-based e-learning media as a virtual laboratory for the students of office administration education. *Jurnal Pendidikan Bisnis Dan Manajemen*, *6*(1), 24–31. doi:10.17977/um003v6i12020p024

Churiyah, M., Subagyo, S., Basuki, A., Dharma, B. A., Filianti, F., & Sakdiyyah, D. A. (2020). mobile learning application berbasis android: peran guru dalam pembelajaran peserta didik Gen Z & Alfa. *Jurnal Graha Pengabdian*, *2*(4), 283-295. doi: http://dx.doi.org/10.17977/um078v2i42020p283-295

Collard, P., & Looney, J. (2014). Nurturing creativity in education. *European Journal of Education*, *49*(3), 348-364.

Dewi, D. P., Aeni, A. N., & Nugraha, R. G. (2023). Development of website-based learning media on the practice of pancasila on student learning motivation. *Jurnal Cakrawala Pendas*, *9*(2), 250–261. doi:10.31949/jcp.v9i2.4735

Fanani, A., Rosidah, C. T., Juniarso, T., Roys, G. A., Putri, E. S., & Vannilia, V. (2022). Bahan ajar digital berbasis multiaplikasi mata pelajaran IPAS SD. *Jurnal Pembelajaran, Bimbingan, Dan Pengelolaan Pendidikan*, *2*(12), 1175–118. doi:10.17977/um065v2i122022p1175-118

Fauhah, H., & Rosy, B. (2020). Analisis model pembelajaran make a match terhadap hasil belajar siswa. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, *9*(2), 321–334. doi:10.26740/jpap.v9n2.p321-334

Gesy, S. S., Basuki, A., Churiyah, M., & Agustina, Y. (2022). Meningkatkan berpikir kritis melalui media pembelajaran google site model case based learning. *Jurnal Ekonomi, Bisnis Dan Pendidikan (JEBP)*, *2*(2), 188–201. doi:10.17977/um066v2i22022p188-201

Greenstein, L. M. (2012). *Assessing 21st century skills: A guide to evaluating mastery and authentic learning*. Corwin Press.

Guan, N., Song, J., & Li, D. (2018). On the advantages of computer multimedia-aided english teaching. *Procedia Computer Science*, *131*, 727–732. doi:10.1016/j.procs.2018.04.317

Handayani, P., Sujarwo, S., & Khoiriyah, M. A. (2022). Media video games wordwall dan lembar kerja untuk kemampuan membilang dan motivasi anak. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(6), 6523–6536. doi:10.31004/obsesi.v6i6.3152

Jusra, H., & Nuranggraeni, D. (2023). Application of google sites assisted problem based learning model to junior high school students' mathematical problem solving ability. *Desimal: Jurnal Matematika*, *6*(2), 145-152. doi: http://dx.doi.org/10.24042/djm.v6i2.18073

Maharani, N., & Kartini, K. S. (2019). Penggunaan google classroom sebagai pengembangan kelas virtual dalam keterampilan pemecahan masalah topik kinematika pada mahasiswa jurusan sistem komputer. *PENDIPA Journal of Science Education*, *3*(3), 167–173. doi:10.33369/pendipa.3.3.167-173

Mulyaningsih, T., Hendratno, H., & Subrata, H. (2023). Literature review: development of google sites – based multimedia to improve elementary school students' reading literacy. *International Journal of Emerging Research and Review*, *1*(4), 000045. doi:10.56707/ijoerar.v1i4.45

Nasution, N. E. A., AlMuhdhar, M. H. I. A., Sari, M. S., & Balqis, B. (2023). Relationship between critical and creative thinking skills and learning achievement in biology with reference to educational level and gender. *Journal of Turkish Science Education*. doi:10.36681/tused.2023.005

Nicolaou, C., Matsiola, M., & Kalliris, G. (2019). Technology-enhanced learning and teaching methodologies through audiovisual media. *Education Sciences*, *9*(3), 196. doi:10.3390/educsci9030196

Nur, H. (2021). Perancangan media pembelajaran berbasis e–learning menggunakan google site pada mata pelajaran jaringan lanjut di SMK LMC model industri. *Jurnal Vinertek (Vokasional Informatika Edukasi Riset Dan Teknologi)*, *1*(2), 16-20.

Nurlatifah, N., & Suprihatiningrum*, J. (2023). Pengembangan google sites berbasis inkuiri terbimbing pada materi asam basa sebagai media belajar mandiri siswa SMA/MA kelas XI. *Jurnal Pendidikan Sains Indonesia*, *11*(1), 67–83. doi:10.24815/jpsi.v11i1.27391

Nurmanita, M. (2022). Efektivitas pembelajaran pancasila berbasis google sites berbantuan quizizz untuk meningkatkan kemampuan berpikir kritis mahasiswa. *Ideas: Jurnal Pendidikan, Sosial, Dan Budaya*, *8*(1), 137. doi:10.32884/ideas.v8i1.644

Nuryati, N., Subadi, T., Muhibbin, A., Murtiyasa, B., & Sumardi, S. (2022). Pembelajaran statistik matematika berbantuan website google sites (Quizizz) di Sekolah Dasar. *Jurnal Basicedu*, *6*(2), 2486–2494. doi:10.31004/basicedu.v6i2.2377

Patrício, R., Moreira, A. C., & Zurlo, F. (2018). Gamification approaches to the early stage of innovation. *Creativity and Innovation Management*, *27*(4), 499–511. doi:10.1111/caim.12284

Pubian, Y., Yulianti, D., Fitirawan, H., Nurwahidin, M., & Riswandi, R. (2023). Pengembangan model blended learning berbasis google site untuk meningkatkan efektivitas pembelajaran siswa. *Jurnal Teknologi Pendidikan : Jurnal Penelitian Dan Pengembangan Pembelajaran*, *8*(2), 392. doi:10.33394/jtp.v8i2.6604

Ramadia, G., Komariah, K., & Arifin, M. H. (2023). Pengembangan multimedia berbasis google sites pada materi kegiatan ekonomi terhadap pemahaman konsep siswa kelas IV Sekolah Dasar. *Paedagoria: Jurnal Kajian, Penelitian Dan Pengembangan Kependidikan*, *14*(3), 276-284. doi: https://doi.org/10.31764/paedagoria.v14i3.16162

Rizqi, M. A., & Subanji, S. (2021). Analisis praktek pembelajaran daring persamaan garis lurus berbantuan media geogebra melalui google sites. *AKSIOMA : Jurnal Matematika Dan Pendidikan Matematika*, *12*(1), 141–154. doi:10.26877/aks.v12i1.7621

Roberts, D. (2019). Higher education lectures: From passive to active learning via imagery? *Active Learning in Higher Education*, *20*(1), 63–77. doi:10.1177/1469787417731198

Roodt, S., & de Villiers, C. (2012). *Using Google Sites as an Innovative Learning Tool at Undergraduate Level in Higher Education*. Retrieved from http://aisel.aisnet.org/ecis2012/11

Sadikin, A., & Hakim, N. (2019). Pengembangan media e-learning interaktif dalam menyongsong revolusi industri 4.0 pada materi ekosistem untuk siswa SMA. *BIODIK*, *5*(2), 131–138. doi:10.22437/bio.v5i2.7590

Sevtia, A. F., Taufik, M., & Doyan, A. (2022). Pengembangan media pembelajaran fisika berbasis google sites untuk meningkatkan kemampuan penguasaan konsep dan berpikir kritis peserta didik SMA. *Jurnal Ilmiah Profesi Pendidikan*, *7*(3), 1167–1173. doi:10.29303/jipp.v7i3.743

Siburian, J., Corebima, A. D., Ibrohim, I., & Saptasari, M. (2019). Analisis validitas hasil pengembangan perangkat pembelajaran ilmu pengetahuan lingkungan berstrategi inkuiri dan instrumen tes kemampuan berpikir kritis, berpikir kreatif dan hasil belajar kognitif mahasiswa. *BIODIK*, *5*(1), 31–47. doi:10.22437/bio.v5i1.6825

Silvanus, J., & Ridwan, R. (2022). Efektivitas pembelajaran praktikum dengan google sites berbantuan quizstar untuk meningkatkan kemampuan berpikir kreatif mahasiswa era COVID-19. *Jurnal Teknologi Pendidikan*, *11*(2), 155–163. doi:10.32832/tek.pend.v11i2.6118

Sridhara, R. N., & Raghunandana, M. (2019). Best practice of google site usage in noble group of institutions library and information center. *Library Philosophy and Practice (e-journal)*, 1-13.

Sugiyani, Y., Rosalina, V., & Yunan, I. (2014). Perancangan aplikasi edukatif berbasis multimedia untuk memudahkan siswa belajar membaca pada mata pelajaran bahasa indonesia. *Jurnal PROSISKO*, *1*, 55–59. Retrieved from http://www.ilmukomputer.com/

Sukmawati, A., Sajidan, S., & Harlita, H. (2017, October). Higher order thinking skill in 21 st century: Creative Thinking Skill. In *International Conference on Science Education (ICoSEd)*.

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, *72*, 577–588. doi:10.1016/j.chb.2017.03.010

Wannapiroon, N., & Pimdee, P. (2022). Thai undergraduate science, technology, engineering, arts, and math (STEAM) creative thinking and innovation skill development: a conceptual model using a digital virtual classroom learning environment. *Education and Information Technologies*, *27*(4), 5689–5716. doi:10.1007/s10639-021-10849-w

Wardhani, T. M., & Zaini, I. (2023). Pengembangan media pembelajaran menggambar ilustrasi berbasis google sites di SMPN 1 Nawangan Pacitan. *Jurnal Seni Rupa*, *11*(2), 23-35.

Wulandari, A. P., Salsabila, A. A., Cahyani, K., Nurazizah, T. S., & Ulfiah, Z. (2023). Pentingnya media pembelajaran dalam proses belajar mengajar. *Journal on Education*, *5*(2), 3928–3936. doi:10.31004/joe.v5i2.1074

Wulandari, A. W., Hakim, L., & Sulistyowati, R. (2022). Pengaruh multimedia interaktif berbasis google sites pada materi usaha dan energi untuk peningkatan hasil belajar siswa. *Jurnal Luminous: Riset Ilmiah Pendidikan Fisika*, *3*(2). doi:10.31851/luminous.v3i2.8860

Wulandari, W., Rahmattullah, M., Nor, B., & Rizky, M. (2023). The Effect of the use of interactive learning media based on google sites on student's learning outcomes in class XI taxation material at SMA Negeri 1 Barambai. *SHS Web of Conferences*, *173*, 01001. doi:10.1051/shsconf/202317301001

Wulansari, K., Irdawati, Razak, A., Chatri, M., & Fajrina, S. (2023). Development of e-module with stem nuances to improve students' creative thinking skills. *Jurnal Penelitian Pendidikan IPA*, *9*(7), 5540–5546. doi:10.29303/jppipa.v9i7.4417