



The Effect of Google Sites-Based Reproductive Health Education on Students' Knowledge, Attitudes, and Behaviors in Supporting Sustainable Development Goals (SDG 3: Good Health and Well-Being)

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Abstract: This study aims to examine the effect of Google Sites-based reproductive health education on students' knowledge, attitudes, and behaviors. A quantitative quasi-experimental design with a pretest-posttest control group was employed. The sample consisted of 60 eleventh-grade students divided into two groups of 30 students each. The experimental group received reproductive health instruction using a Google Sites-based deep learning approach, while the control group received the same approach without Google Sites. Data were collected using a multiple-choice test (knowledge) and Likert-scale questionnaires (attitudes and behaviors), and analyzed using Independent Sample t-tests. Results showed significant differences between groups ($p = 0.001$). The experimental group demonstrated higher improvements: knowledge increased from 47.07 to 82.93 (76.2%), compared to 41.20 to 58.93 (43.0%) in the control group; attitudes increased from 61.07 to 89.27 (46.2%), compared to 48.40 to 70.50 (45.7%); and behaviors increased from 61.03 to 86.07 (41.0%), compared to 60.27 to 66.20 (9.8%). These findings indicate that integrating Google Sites as a digital learning medium enhances engagement and learning outcomes. In conclusion, Google Sites-based instruction is an effective strategy for improving students' reproductive health knowledge, fostering positive attitudes, and promoting healthier behaviors.

Keywords: Attitudes; Behavior; Google Sites; Knowledge; Reproductive health

Introduction

Adolescents are an important capital for a nation because they will become the next generation in the future. If at the stage of growth and development they do not get the right direction, then it is likely that the nation will face various obstacles in achieving optimal development. Therefore, the state has a responsibility to ensure the healthy growth and development process of adolescents, both physically and psychosocially. On the other hand, adolescents also have responsibilities for themselves, their families, and their social environment. But in reality, various problems still often occur in this age group, one of which is the increase in risky sexual

behavior caused by low knowledge about reproductive health (Oktaria & Martha, 2023). Adolescence is a transition phase from childhood to adulthood which is characterized by very rapid biological, cognitive, social, and emotional changes. In this period, adolescents are in the process of searching for self-identity so they often experience confusion in understanding the changes that occur in them. This condition can increase susceptibility to various risky behaviors, including unhealthy sexual behaviors, which can ultimately have an impact on adolescent reproductive health (Sumarni & Amin, 2024).

Socializing with peers is one of the dominant factors that affect adolescents' behavior, including in decision-making related to reproductive health. Adolescents tend

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to trust information from peers more than parents or teachers, so the social environment greatly affects their attitudes and behaviors (Tianingrum & Nurjannah, 2020). In addition, the development of information technology and globalization has expanded adolescents' access to various sources of information through the internet. This access not only provides opportunities to obtain useful information, but also increases the risk of exposure to age-inappropriate content and misinformation about sexuality (Santi et al., 2021). This condition shows the importance of learning reproductive health that is carried out in a structured manner, as it has been proven to increase knowledge and form healthy living behaviors (Yudyarto & Hermawan, 2026). However, the level of knowledge of reproductive health in adolescents is still relatively low, especially because they often obtain information from unreliable sources (Fahme et al., 2021).

Various data show that adolescent reproductive health problems are still a serious challenge. Around 2.5% of adolescents are reported to have experienced sexually transmitted infections before marriage, which indicates an urgent need for more comprehensive reproductive health education. Literature reviews also show that the prevalence of sexually transmitted infections in adolescents is quite significant, including HIV/AIDS at 0.3% and syphilis at 1.2% (Vatrisya et al., 2024). In addition, national survey data shows that around 6.6% of adolescent girls aged 15–19 years have been diagnosed with sexually transmitted infections, and around 1.2% of HIV/AIDS cases in Indonesia occur in this age group. This condition reflects the low level of knowledge and access to correct information about reproductive health among adolescents (Putri, 2024).

In addition to the problem of sexually transmitted infections, early marriage is also an important indicator of adolescent reproductive health problems in Indonesia. Data from the Central Statistics Agency shows that in 2022 there were around 8.06% of cases of child marriage that have the potential to cause pregnancy in adolescence. The 2020 National Socio-Economic Survey also noted that around 8.19% of women were married for the first time at the age of 7–15 years. This phenomenon shows that there is limited access to adequate reproductive health information and education for adolescents. In the context of pesantren-based education, learning about reproductive health often faces its own challenges related to cultural norms, religious values, and public perceptions of the discussion of sexual issues (Pakpahan et al., 2025).

In Muslim societies, the issue of reproductive health is often considered a sensitive topic that is rarely discussed openly because it is influenced by certain cultural norms and religious interpretations, so it can be

an obstacle in the delivery of reproductive health education to adolescents (Alomair et al., 2020). Several studies show that reproductive health materials in pesantren are generally still presented normatively and emphasize more on moral and religious aspects, so they have not fully integrated a comprehensive scientific approach. In addition, shame, cultural taboos, and concerns about social rejection are often obstacles for adolescents to obtain reproductive health information openly (Rahmawati & Milla, 2025). One strategy that can be used to overcome these limitations is through the use of digital technology in reproductive health learning. The development of information technology allows the delivery of educational materials in a more interactive, flexible, and accessible manner for adolescents. Web-based platforms such as Google Sites can be an effective learning medium because they allow the integration of various forms of educational materials such as texts, images, videos, and interactive quizzes in one page that is easily accessible to students (Titus et al., 2024).

Previous research has shown that the use of Google Sites-based learning media can significantly improve students' understanding of concepts. Hairunisa et al. (2025) found that Google Sites-based digital modules were able to increase adolescents' knowledge and attitudes about sexual education with an N-Gain value of 0.56 and a significant change in attitude after the use of the module. Similar findings were also reported by Fitroh et al. (2025) who showed that the use of Google Sites as a learning medium can improve students' understanding of various learning materials. In addition, studies on digital health interventions also show that digital platforms are able to improve safer sexual health practices because information can be accessed flexibly and presented with an attractive approach for adolescents (Borji-Navan et al., 2024).

Theoretically, knowledge about reproductive health will form positive attitudes towards healthy sexual behavior, which can further affect adolescent behavior. However, in practice, increased knowledge is not always directly followed by behavioral changes. Previous research has shown that reproductive health knowledge and attitudes only explain about 60% of the variation in attitudes towards early marriage in adolescents at the Bulukumba Regency Islamic Boarding School, so there are still other factors that affect adolescent behavior, such as social environment and family support (Mardia et al., 2024). Education-based health programs play an important role in raising awareness and changing healthy living behaviors (Anwar et al., 2022). Limited access to reproductive health education remains a major factor contributing to risky behaviors among adolescents (Morishima et al., 2024).

Various research results show that health education has an important role in improving the quality of adolescent reproductive health. Health education has been proven to significantly increase adolescents' knowledge and attitudes towards reproductive health (Oktaviani et al., 2024), while the use of video-based media is also effective in increasing awareness and understanding of risky sexual behavior (Rahmadyanti et al., 2025). In addition, reproductive health education has a real influence in shaping better preventive behaviors (Hasrida et al., 2025). The use of technology-based learning media such as Google Sites can increase students' understanding of reproductive system materials (Hakim & Pertiwi, 2023), especially when combined with a contextual approach that can strengthen a deeper understanding of concepts (Fuadi & Irdalisa, 2024). On the other hand, the development of adolescent reproductive health is also influenced by biological and environmental factors (Nursitoyaroh et al., 2024), so comprehensive education is needed, including about risky sexual behaviors to prevent unwanted pregnancy (Mayunita et al., 2025) and the importance of sex education as an effort to prevent these behaviors (Santika & Basuki, 2025). Along with the development of educational technology, learning innovations are increasingly important to improve understanding of concepts and student involvement (Fatimah et al., 2026). Therefore, science learning no longer only focuses on mastering facts, but must be able to encourage deep understanding of concepts, critical thinking, creativity, and the ability to collaborate (Yustiani et al., 2026).

Based on various studies that have been conducted, most studies on reproductive health education still use conventional approaches such as lectures, seminars, or face-to-face discussions. Meanwhile, research that utilizes digital learning media, especially Google Sites, in the context of pesantren education is still very limited. In fact, the use of this platform has great potential to integrate reproductive health materials with educational approaches that are more interesting, flexible, and in accordance with the learning characteristics of the digital generation. Thus, the novelty of this research lies in the integration of Google Sites-based reproductive health learning in the context of pesantren education, especially in adolescents at MA Pondok Pesantren Babul Khaer, Bulukumba Regency. This study not only examines the increase in knowledge, but also analyzes changes in adolescents' attitudes and behaviors after receiving the digital media-based learning intervention. In addition, this study also considers the social, cultural, and religious contexts inherent in the pesantren environment, so that it is expected to produce a more contextual and relevant reproductive health learning

model. This research is important to be carried out because the low knowledge of reproductive health, the high risk of unhealthy sexual behavior, and the limitations of learning methods that are appropriate to the context of pesantren are still the main challenges in adolescent health education. Therefore, the development of Google Sites-based learning media is expected to be an innovation in the delivery of reproductive health materials that are more effective, interesting, and accessible to adolescents. Based on this description, the researcher is interested in conducting a study entitled "The Effect of Google Sites-Based Reproductive Health Education on Students' Knowledge, Attitudes, and Behaviors in Supporting Sustainable Development Goals (SDG 3: Good Health and Well-Being)".

Method

This study uses a quantitative approach with a quasi-experimental method using a pretest-posttest control group design. This design is used to determine the influence of Google Sites-based reproductive health learning on student knowledge, attitudes, and behaviors. In this design, there are two research groups, namely the experimental group and the control group. The experimental group was taught using the Google Sites Deep learning strategy, while the control group used the deep learning strategy without google sites. Both groups were given a pretest before treatment and a posttest after the learning process to measure changes in students' knowledge, attitudes, and behavior.

The research was carried out at MA Babul Khaer, Bulukumba Regency in the even semester of the 2025/2026 school year. The research population was all grade XI students totaling 82 people. The research sample amounted to 60 students who were selected using the purposive sampling technique, which is the selection of samples based on certain criteria that are relevant to the research objectives, such as students who actively participate in learning and have access to digital devices to access learning media. The sample was then divided into two groups based on the existing class (intact group), namely 30 students as the experimental group and 30 students as the control group. The variables in this study consist of independent variables, namely Google Sites-based reproductive health learning, while dependent variables include students' reproductive health knowledge, attitudes, and behaviors.

The data collection technique uses three types of research instruments, namely: Knowledge test in the form of multiple choice to measure students' level of understanding of reproductive health. Attitude

questionnaire uses the Likert scale to measure students' attitudes towards reproductive health. Behavioral questionnaire uses the Likert scale to measure students' behavior related to reproductive health. Before being used in the study, the research instrument was first tested for validity and reliability. The validity test was conducted using Pearson Product Moment correlation, while the reliability test was conducted using Cronbach's Alpha coefficient to ensure the internal consistency of the instrument.

The research data were analyzed using descriptive and inferential statistical analysis with the help of the

IBM SPSS Statistics program. The analysis prerequisite test was carried out through the Shapiro–Wilk normality test and the variance homogeneity test. After meeting the prerequisites, hypothesis testing was carried out using an Independent Sample t-test to determine the difference in knowledge, attitude, and behavior outcomes between the experimental group and the control group after the treatment was given. Below you can see in Figure 1 the complete procedure for this research from the implementation stage to the end.

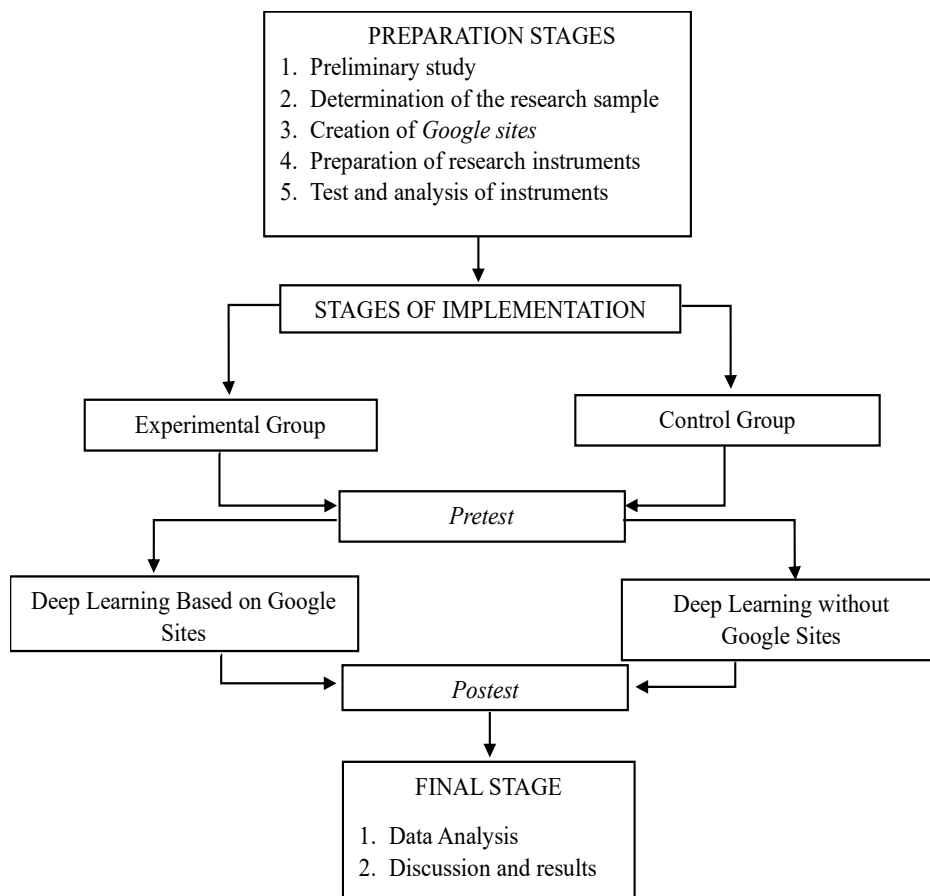


Figure 1. Research flowchart

Result and Discussion

This study aims to determine the effect of the use of Google Sites in Deep Learning strategy on the knowledge, attitudes, and reproductive health behaviors of grade XI students at MA Pondok Pesantren Babul Khaer, Bulukumba Regency. This study involved two groups, namely an experimental group that used a Google Sites-based deep learning strategy as a learning medium and a control group that used a Deep Learning strategy without Google Sites. Data analysis was carried out using descriptive statistics and inferential statistics

with the help of the SPSS version 24 program. Based on the results of the research that has been conducted, several research findings were obtained as follows.

Students' reproductive health knowledge was measured through pretest before learning and posttest after learning in experimental classes and control classes. The data obtained was then analyzed in a descriptive statistical manner to determine the average score, highest score, lowest score, and standard deviation, so that the level of knowledge of students could be compared between the experimental class that

used Google Sites and the control class without Google Sites.

Table 1. Descriptive analysis of reproductive health knowledge

Descriptive Analysis	Experimental Classes		Control Class	
	Pretest	Posttest	Pretest	Posttest
Number of Samples	30	30	30	30
Minimum Score	36	72	28	48
Maximum Value	56	92	56	68
Average score	47.07	82.93	41.20	58.93
Standard Deviation	5.91	5.93	6.73	5.93

Based on Table 1 the number of samples in the experimental class and the control class was 30 students each. In the experimental class, the average score increased from 47.07 (pretest) to 82.93 (posttest). Meanwhile, in the control class, the average score increased from 41.20 (pretest) to 58.93 (posttest). Although both classes experienced improvements, the average increase in the experimental class was higher than in the control class. This shows that learning in the experimental class is more effective in improving students' reproductive health knowledge.

Students' reproductive health attitudes were obtained through questionnaires given to experimental classes and control classes at the pretest and posttest stages. The pretest aims to find out the initial attitude of students, while the posttest aims to find out the change in attitude after learning. The data were then analyzed descriptively to compare reproductive health attitudes between the experimental class using Google Sites-based Deep Learning strategy and the control class without Google Sites.

Table 2. Descriptive analysis of reproductive health attitudes

Descriptive Analysis	Experimental Classes		Control Class	
	Pretest	Posttest	Pretest	Posttest
Number of Samples	30	30	30	30
Minimum Score	48	83	36	65
Maximum Value	72	96	60	74
Average score	61.07	89.27	48.40	70.50
Standard Deviation	5.34	3.43	5.97	2.22

Based on Table 2, the number of samples in the experimental class and the control class was 30 students each. In the experimental class, the average attitude score increased from 61.07 (pretest) to 89.27 (posttest). Meanwhile, in the control class, the average score increased from 48.40 (pretest) to 70.50 (posttest). Although both classes experienced improvements, the average increase in the experimental class was higher and more even than in the control class. This shows that

learning in experimental classes is more effective in improving students' reproductive health attitudes.

Students' reproductive health behavior was measured through questionnaires given at the pretest and posttest stages to the experimental class and the control class. The pretest aims to find out the initial behavior of students, while the posttest aims to find out the change in behavior after learning. The data were then analyzed descriptively to compare reproductive health behaviors between the experimental class using Google Sites-based Deep Learning and the control class without Google Sites.

Table 3. Descriptive analysis of reproductive health behavior

Descriptive Analysis	Experimental Classes		Control Class	
	Pretest	Posttest	Pretest	Posttest
Number of Samples	30	30	30	30
Minimum Score	56	80	55	61
Maximum Value	67	92	64	70
Average score	61.03	86.07	60.27	66.20
Standard Deviation	3.07	3.02	2.28	2.23

Based on Table 3 the number of samples in the experimental class and the control class was 30 students each. In the experimental class, the average behavioral score increased from 61.03 (pretest) to 86.07 (posttest). Meanwhile, in the control class, the average increased from 60.27 (pretest) to 66.20 (posttest). Overall, both classes experienced improvements in reproductive health behaviors, but improvements in the experimental class were much higher than in the control class. This shows that Google Sites-based learning is more effective in improving students' reproductive health behaviors.

The normality test is carried out to find out whether the research data is distributed normally or not. In this study, the normality test was used to determine whether the data in the experimental class and the control class which included the variables of knowledge, attitudes, and reproductive health behavior of students were distributed normally. Normality testing was carried out using the Shapiro-wilk test through the SPSS data processing program version 24 with a significance level of 5% ($\alpha = 0.05$). The decision-making criteria in this test is that if the significance value is < 0.05 , the data is declared not normally distributed, while if the significance value is > 0.05 , the data is declared to be normally distributed. The results of the normality test are presented in the form of a table that can be seen in Table 4.

Based on Table 4, regarding the results of the normality test of reproductive health knowledge, attitudes, and behaviors, it is known that the data from the three variables in the experimental class and the control class have been tested to determine whether the

research data is normally distributed or not. This normality test is carried out as one of the requirements before conducting further statistical analysis. The test results showed that the significance value (Sig.) for each variable, both knowledge, attitudes, and reproductive health behaviors, was above the value of 0.05. This shows that all research data is distributed normally. Thus, it can be concluded that the data on knowledge, attitudes, and reproductive health behaviors in the experimental class and the control class have met the assumption of normality so that the next statistical analysis can use the homogeneity test to determine the difference or influence of the treatment given in the study.

Table 4. Results of the normality test of health knowledge, attitudes and behaviors

Variable	Class	Sig.	Information
Reproductive Health Knowledge	Pretest Experiment	0.064	Normal
	Posttest Experiment	0.072	Normal
Reproductive Health Attitudes	Pretest control	0.362	Normal
	Posttest control	0.072	Normal
Reproductive Health Behaviors	Pretest Experiment	0.142	Normal
	Posttest Experiment	0.602	Normal
	Pretest Control	0.215	Normal
Reproductive Health Attitudes	Posttest Control	0.060	Normal
	Pretest Experiment	0.867	Normal
	Posttest Experiment	0.783	Normal
Reproductive Health Behaviors	Pretest Control	0.210	Normal
	Posttest Control	0.267	Normal

After the data of the two groups is declared to be normally distributed, the next stage is to conduct a homogeneity test. This test aims to find out whether the variance of data in the experimental class and the control class in the study have similarities or not. In this study, the homogeneity test was carried out using Levene's Test through the SPSS data processing program version 24 with a significance level of 5% ($\alpha = 0.05$). The basis for decision-making in this test is that if the significance value > 0.05 , then the variance of the data from the two groups is declared homogeneous or has the same variance. On the other hand, if the significance value ≤ 0.05 , then the variance of data from the two groups is declared to be inhomogeneous. The results of the homogeneity test were then presented in the form of a table to show the similarity of variance in the data of knowledge, attitudes, and reproductive health behaviors of students in class XI MA of the Babul Khaer Islamic Boarding School, Bulukumba Regency before further statistical analysis was carried out.

Based on Table 5, regarding the results of the homogeneity test of reproductive health knowledge, attitudes, and behaviors, it is known that the homogeneity test was carried out to find out whether the variance of data between the research groups had

similarities or not. The test results showed that the significance value (Sig.) on the reproductive health knowledge variable was 0.526, which means it was greater than 0.05. This shows that the variance of knowledge data between the groups compared is homogeneous. In addition, the variables of reproductive health attitudes and reproductive health behaviors also showed significance values greater than 0.05, so that the two variables were also declared homogeneous. Thus, it can be concluded that all variables in this study have the same or homogeneous variance. Therefore, the research data has met one of the requirements to conduct statistical analysis of the Independent Sample T-Test in testing the difference or influence of the treatment given in the study.

Table 5. Results of the reproductive health knowledge, attitude, and behavior homogeneity test

Variable	Sig.	Information
Reproductive Health Knowledge	0.526	Homogeneous
Reproductive Health Attitudes	0.542	Homogeneous
Reproductive Health Behaviors	0.111	Homogeneous

Based on the results of the normality test and the homogeneity test, it is known that the research data is normally distributed and has a homogeneous variance. Therefore, the data analysis was then carried out by hypothesis testing using the Independent Sample T-Test with the help of the SPSS data processing program version 24 for windows. In this study, the Independent Sample T-Test aims to find out whether there is a difference in learning outcomes between the experimental class that uses Google Sites-based reproductive health learning and the control class that uses Deep Learning Strategy in class XI MA students of the Babul Khaer Islamic Boarding School, Bulukumba Regency. The decision-making criteria in testing this hypothesis is that if the significance value (Sig. 2-tailed) < 0.05 , then H_0 is rejected and H_1 is accepted, which means that there is a significant influence of reproductive health learning with the Google Sites-based deeplearning teaching method on students' reproductive health knowledge, attitudes, and behaviors. On the other hand, if the significance value (Sig. 2-tailed) > 0.05 , then H_0 is accepted and H_1 is rejected, which This means that there is no significant influence of reproductive health learning using Google Sites-based deeplearning teaching methods on students' reproductive health knowledge, attitudes, and behaviors. The following is a table of the results of the Independent sample T-Test (Table 6).

Based on Table 6, the results of the Independent Sample T-Test showed that the significance value (Sig. 2-tailed) on the three variables, namely reproductive health knowledge, reproductive health attitudes, and

reproductive health behaviors, was 0.001 each. The significance value was less than 0.05 ($0.001 < 0.05$), so it can be concluded that there is a significant difference between the experimental class and the control class. In the reproductive health knowledge variable, a significance value of 0.001 indicates that reproductive health learning using Google Sites-based deeplearning teaching methods provides a significant difference in students' knowledge compared to learning that does not use these media. Furthermore, the reproductive health attitude variable also obtained a significance value of 0.001, which means that there was a significant difference in reproductive health attitudes between students in the experimental class and the control class after being given Google Sites-based learning treatment. Similarly, in the reproductive health behavior variable, the significance value obtained was 0.001, which indicates that there was a significant difference in reproductive health behavior between the two groups. This indicates that the use of Google Sites as a learning medium has an influence on changes in students' reproductive health behavior. Thus, it can be concluded that Google Sites-based reproductive health learning has a significant effect on the knowledge, attitudes, and behaviors of reproductive health students in grade XI.

Table 6. Independent sample t-test results

Variable	Sig. (2-tailed)	Information
Reproductive Health Knowledge	0.001	There are significant differences
Reproductive Health Attitudes	0.001	There are significant differences
Reproductive Health Behaviors	0.001	There are significant differences



Figure 2. Experimental class students access reproductive health learning videos via Google sites using laptops

Based on the results of the inferential analysis in this study, it was found that there was a difference in reproductive health knowledge between students who were taught through Google Sites-based Deep Learning Strategy and students who were taught through Deep

Learning Strategy without Google Sites. The results of the Independent Sample T-Test showed that the significance value (Sig. 2-tailed) was $0.001 < 0.05$, so it can be concluded that there is a significant difference between the two groups. The average knowledge score in the experimental class using Google Sites-based Deep Learning Strategy reached 82.93, while in the control class that used learning without Google Sites only reached 58.93. The average difference shows that the use of Google Sites-based learning media has a greater influence on improving students' reproductive health knowledge. This shows that learning that utilizes digital technology is able to help students understand the material more deeply through the presentation of material that is interactive, interesting, and easily accessible at any time.

The results of this study are in line with the research Hartari et al. (2025) which shows that the use of Google Sites-based learning media can significantly improve students' learning outcomes and concept understanding compared to conventional learning. Google Sites-based learning media allows teachers to present materials in various forms such as text, images, videos, and interactive quizzes to increase student involvement in the learning process and have an impact on improving students' cognitive learning outcomes.

Research by Arrahma et al. (2025) also shows that the use of Google Sites as a learning medium can improve students' critical thinking skills and learning outcomes because it provides a more contextual and interactive learning experience. The integration of technology in the learning process is one of the demands of 21st century education that encourages students to learn actively and independently so that the understanding of the concepts obtained becomes more deep. Alhassan et al. (2025) also states that Digital educational tools such as mobile applications and web platforms are effective in delivering reproductive health information to adolescents in an engaging and accessible way.

In line with research Guo et al. (2025) Web-based reproductive health education also shows that the use of digital technology in learning has a positive influence on the improvement of adolescents' knowledge. A systematic review and meta-analysis involving 11 studies with a total of 7,876 respondents showed that web-based reproductive health education had a knowledge improvement effect with a standardized mean difference (SMD) value of 0.59, which showed a moderate effect on improving adolescent reproductive health knowledge. This shows that digital technology-based health education interventions can be an effective strategy in improving reproductive health literacy in adolescents.

Based on the results of statistical analysis in this study and supported by various national and international studies, it can be concluded that there is a difference in reproductive health knowledge between students who are taught through Google Sites-based Deep Learning strategy and students who are taught through Deep Learning strategy without Google Sites. Learning that utilizes digital media such as Google Sites has proven to be more effective in improving reproductive health knowledge because it is able to provide a more interactive, flexible, and student-centered learning experience.

Based on the results of the inferential analysis in this study, it was found that there was a difference in reproductive health attitudes between students who were taught through Google Sites-based Deep Learning Strategy and students who were taught through Deep Learning strategy without Google Sites. The results of the Independent Sample T-Test showed that the significance value (Sig. 2-tailed) was $0.001 < 0.05$, so it can be concluded that there is a significant difference between the two groups. The average reproductive health attitude score in the experimental class using Google Sites-based Deep Learning strategy reached 89.27, while in the control class taught without Google Sites it was only 70.50. The average difference shows that the use of Google Sites-based learning media has a better influence in shaping students' positive attitudes towards reproductive health. This happens because technology-based learning allows students to obtain more interesting and interactive information through various media such as text, images, videos, and materials that can be accessed flexibly, thereby increasing student involvement in the learning process.

The results of this study are in line with the research Wahyuni et al. (2025) which shows that the use of website-based media in reproductive health education is able to significantly increase adolescents' knowledge and attitudes compared to the use of conventional learning media. Website-based media allows adolescents to obtain reproductive health information more easily and attractively so that it can influence their perspective and attitude towards reproductive health. The study showed that reproductive health education through website media provides an increase in more positive attitudes in adolescents after participating in the learning process.

In addition, the research by Arrahma et al. (2025) It also shows that the media can increase students' learning engagement and help them understand the learning material more deeply. Google Sites allows teachers to present learning materials interactively through various digital learning resources so that students can learn independently and understand the material better. This

has an impact on changing the attitude of students who become more positive towards the learning material learned. The use of media has been proven to significantly increase adolescents' knowledge and attitudes (Rama et al., 2025). This learning media includes videos. This is in line with research by Rahayu & Yerimadesi (2022) who stated that video learning media can improve student understanding because it presents information visually and attractively. It has also proven to be effective in increasing knowledge because information is presented simply and systematically (Yuniarly et al., 2023), Research conducted by Guo et al. (2025) shows that the use of digital-based learning has a positive influence on adolescents' attitudes towards reproductive health. The results of the study showed that web-based reproductive health education had an effect on improving adolescents' attitudes with a standardized mean difference (SMD) value of 0.16, which showed a positive change in attitudes after participating in a digital-based reproductive health education program. This shows that the use of digital technology in health education can be an effective strategy to increase adolescents' positive attitudes towards reproductive health.



Figure 3. At the end of the learning activity, students take turns through group representatives to present the results of the discussion in front of the class, while other groups provide responses or questions regarding the results of the presentation

Thus, based on the results of statistical analysis, it can be concluded that there is a difference in reproductive health attitudes between students who are taught through Google Sites-based Deep Learning strategy and students who are taught through Deep Learning strategy without Google Sites. Learning that utilizes digital media such as Google Sites has been proven to be more effective in shaping students' positive attitudes towards reproductive health because it provides a more interactive, flexible, and student-centered learning experience.

Based on the results of the inferential analysis in this study, it was found that there was a difference in reproductive health behavior between students who were taught through Google Sites-based Deep Learning

strategy and students who were taught through Deep Learning strategy without Google Sites. The results of the Independent Sample T-Test showed a significance value of Sig. (2-tailed) of $0.001 < 0.05$, so it can be concluded that there is a significant difference between the two groups. The average reproductive health behavioral score in the experimental class taught using Google Sites-based Deep Learning strategy reached 86.07, while the control class taught without Google Sites obtained an average of 66.20. The difference in average scores shows that the use of Google Sites-based learning media is able to have a better influence on the formation of students' reproductive health behaviors. This happens because technology-based learning allows students to obtain reproductive health information in a more interesting, interactive, and independently accessible manner, thereby encouraging students to implement better reproductive health behaviors in daily life.



Figure 4. Group representatives present the results of the assignment in the form of a poster that was created collaboratively using the Canva application on a laptop in front of the class

The results of this study are in line with the research Pratiwi & Sudaryanto (2024) which states that reproductive health education has a significant influence on changes in adolescent behavior related to reproductive health. Reproductive health education provided systematically can help adolescents understand the risks of unhealthy sexual behaviors as well as encourage them to adopt more responsible behaviors toward reproductive health. The study shows that reproductive health education interventions can reduce risky behaviors in adolescents as well as promote more positive health behaviors. This is also in line with research by Sihombing & Lubis (2025) which states that health education interventions are proven to be able to change individual behavior to be healthier through increased knowledge and awareness. Therefore, health learning using media can increase public health knowledge and awareness (Nubatonis & Ayatullah, 2019).

In addition, research by Sari et al. (2024) shows that adolescent reproductive health behaviors are influenced by the level of knowledge and access to reproductive

health information. Reproductive health learning plays an important role in helping students understand and implement behaviors that support reproductive health and has been proven effective in improving students' knowledge and attitudes (Thompson et al., 2017). Adolescents who receive good reproductive health education tend to have healthier behaviors, such as maintaining the cleanliness of the reproductive organs, avoiding risky sexual behaviors, and having a higher awareness of the importance of reproductive health (Liang et al., 2019). Therefore, the provision of reproductive health education through various learning media is very important (Desrosiers et al., 2020). One innovative approach that can be applied is the use of digital technology, such as websites, which has been proven to improve adolescents' knowledge, attitudes, and behaviors related to reproductive health (Wang et al., 2020).

Health education plays an important role in improving adolescents' knowledge and attitudes towards reproductive health, which ultimately influences their behavior in maintaining reproductive well-being (Oktaviani et al., 2024). Various approaches such as video-based learning and multimedia integration have been shown to increase students' awareness, engagement, and understanding of risky sexual behaviors (Putri, 2024). In addition, reproductive health education and family planning programs significantly contribute to the development of preventive health behaviors among adolescents (Sari et al., 2024). The use of digital learning media such as Google Sites also shows strong potential in improving students' conceptual understanding, especially in reproductive system materials (Hidayat et al., 2023). Contextual and ethnoscience-based learning further supports students in understanding the concept of reproductive health in a more meaningful way.

In addition, the effectiveness of digital media such as Google Sites in changing behavior is not only due to increased knowledge, but also because of its ability to influence students' psychological and social factors. Digital media allows the presentation of interactive, personal, and easily accessible information so that it can increase student engagement, motivation, and self-efficacy in implementing healthy behaviors. Studies show that digital-based health interventions are able to encourage behavior change because they utilize the principles of behavior change, such as providing feedback, strengthening motivation, and continuous access to information (Hong et al., 2025). In addition, the use of digital platforms also increases digital health literacy which plays an important role in helping adolescents understand, evaluate, and apply health information in daily life (Hawkins et al., 2025).

Based on the results of data analysis and supported by the findings of previous research, it can be concluded that there is a difference in reproductive health behavior between students who learn with Google Sites-based Deep Learning strategies and students who learn without these media. The use of Google Sites has proven to be more effective because it is able to increase interaction, facilitate access to information, and encourage active involvement of students in the learning process. This digital media not only serves as a means of delivering material, but also facilitates the internalization of values and the formation of healthy habits through contextual, interactive, and sustainable learning experiences, thus having a real impact on changes in students' reproductive health behaviors.

Conclusion

Based on the results of the study, it can be concluded that reproductive health learning based on Google Sites has a significant effect on students' knowledge, attitudes, and behaviors ($p = 0.001$). The most noticeable increase was in the knowledge aspect, where the average score of students in the experimental class increased from 47.07 to 82.93, higher than the control class which only increased from 41.20 to 58.93. Furthermore, in the attitude aspect, the average score of the experimental class increased from 61.07 to 89.27, higher than the control class from 48.40 to 70.50. In terms of behavior, the increase was also greater in the experimental class, from 61.03 to 86.07, compared to the control class from 60.27 to 66.20. These findings show that the use of Google Sites as a digital learning medium is able to increase student engagement and provide a more interactive learning experience, thus having an impact on improving overall learning outcomes. Further research is recommended to involve a larger sample size and a more diverse school coverage to improve the generalization of results. In addition, it is necessary to develop a research design that examines the long-term effects of digital media use on behavior change and combines Google Sites with other learning media to obtain more comprehensive results.

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Author Contributions

Conceptualization, methodology, software, formal analysis, investigation, data curation, writing—initial draft, visualization, project administration, funding Procurement, A.M.HM.; validation, A.M.HM., A.A.A., R., F.D., and M.T.; resources, writing—review and editing, supervised, A.A.A., R., F.D., and M.T. All authors have read and approved the final version of the published manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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