Bioedukasi
Jurnal Biologi dan Pembelajarannya

Vol. 23 No 3, October 2025, page 560-567
e-ISSN: 2580-0094; p-ISSN:1693-3931
DOI: 10.19184/bioedu.v23i3.53794
bioedukasi.jurnal.unej.ac.id

Integration of EduCanva in Google Sites to Improve Student Collaboration Skills in the Context of Agroindustry

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Article Info

Article history:
Received September 25, 2025
Revised October 31, 2025
Accepted October 31, 2025

Keywords: (A-Z)
Digital Learning
Educational Technology
Innovative Media
21st century Skills

ABSTRACT

This study aims to develop Google Sites-based digital learning media integrated with EduCanva to improve students' collaboration skills in agro industrial schools. The research method uses a research and development design with the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. Data were collected through validation sheets, questionnaires, tests, interviews, and observations, then analyzed based on validity, practicality, and effectiveness. Expert validation results showed a percentage of 97.22% from subject matter experts, 84.375% from media experts, and 84.375% from learning experts in the highly valid category. The practicality test obtained a 100% response from teachers and a 92.29% response from students, both of which were categorized as very practical. The effectiveness test showed an increase in learning outcomes with an N-gain value of 0.53 (moderate category) and an increase in student collaboration skills of 11.38% from cycle I to cycle II, which was categorized as fair to good. These findings prove that Google Sites-based learning media integrated with EduCanva is feasible, practical, and effective for use in learning. The novelty of this research lies in the combination of two digital platforms that are rarely studied in the context of biology learning in agro industrial areas. This media not only improves conceptual understanding but also strengthens collaboration skills as an important 21st-century competency.

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1. INTRODUCTION

Agro-industrial areas are regions that focus on processing agricultural products into value-added products [1]. The agro-industrial process involves many stages, from production and processing to distribution, requiring collaboration skills [2]. This proves that agro-industrial areas need human resources who are not only technically skilled but also able to work together effectively [3]. Therefore, schools located in agro-industrial areas have a strategic role in instilling collaborative skills in students from an early age so that they are ready to face the demands of the world of work and global developments [4].

Learning conditions in Indonesian schools, including those in agro-industrial areas, are still dominated by one-way lecture methods. This situation limits students' opportunities to interact, discuss, and collaborate in solving problems [5]. Research by Grahmayanuri et al. (2024) also confirms that lecture-style teaching hinders active student participation and limits the development of collaborative skills [6]. Collaboration skills are one of the core competencies of the 21st century that are important in education, community life, and the world of work [7].

Digital-based learning media is an innovative solution to improve the quality of learning. Google Sites, as a web-based platform, has been proven effective in improving student learning outcomes and participation. Research by Fitroh, Arifin, & Puspitasari (2025) shows that the use of Google Sites in Islamic Education (PAI) lessons at vocational high schools (SMK) can improve students' conceptual understanding [8]. Similar results were reported by Nasution & Astuti (2024), who found that Google Sites encourages active student engagement in science (IPA) learning [9].

EduCanva also contributes significantly to providing attractive and easy-to-use visual content. Research by Resky, Nurindah, & Rahim (2025) developed Canva-based media for science learning and received positive responses from students due to its interactive visual display and encouragement of collaboration [10]. Other findings from Nugraha et al. (2023) confirm that EduCanva can enhance creativity while facilitating collaborative learning [11].

The integration of Google Sites with EduCanva has rarely been studied, even though both have great potential when combined. Google Sites provides a structured web platform, while EduCanva offers interactive visual content that can increase student engagement. This combination has the potential to produce effective, engaging, and relevant learning media to support students' collaboration skills [12].

The characteristics of the agro-industrial region further reinforce the urgency of this research. The Paiton subdistrict in Probolinggo Regency is one of the rapidly developing agro-industrial areas [13]. The local community is known for its culture of mutual cooperation or anut gobyuk, which reflects solidarity and a spirit of togetherness [14]. The Probolinggo community is characterized by its resilience, straightforwardness, openness, and entrepreneurial spirit [15]. These social values can be strengthened through collaborative digital learning media.

Previous studies have examined the use of Google Sites and EduCanva separately. For example, Fitroh, Arifin, & Puspitasari (2025) showed the effectiveness of Google Sites in improving students' conceptual understanding, while Resky, Nurindah, & Rahim (2025) emphasized the advantages of Canva in presenting interactive visual media that motivates students. However, the integration of both as digital learning media to improve students' collaboration skills, especially in the agro-industrial sector, is still very limited. Therefore, this study focuses on developing Google Sites-based learning media integrated with EduCanva with the aim of producing valid, practical, and effective products, while also measuring their impact on students' collaboration skills.

2. RESEARCH METHOD

This research is classified as research and development because it produces a development product in the form of web-based learning media, namely Google Sites integrated with EduCanva. The development model used is ADDIE. Product development in this research also aims to test the developed product in terms of validity, practicality, and effectiveness. In this development research, the final stage of evaluation was carried out in accordance with the ADDIE stages (Analysis, Design, Develop, Implement, and Evaluate), but at the final stage, dissemination was carried out through the publication of research results. Data collection techniques were carried out through interviews with teachers, questionnaires on student and teacher needs, pre-tests and post-tests, student and teacher response questionnaires, and documentation. The initial development activities were carried out by interviewing teachers and distributing questionnaires on student and teacher needs. The results of the interviews and questionnaires formed the initial draft, which was then developed based on the planning results. The initial draft of the developed product was then validated by three validators, namely subject matter experts, development experts, and media experts. The validation results were in the form of product validity scores along with suggestions and product evaluations.

The revised product was then tested on a small scale with ten students from a class of thirty tenth graders at MA Mambaul Ulum Probolinggo. The small-scale test aimed to determine the feasibility and obtain feedback from students so that improvements could be made before implementing it on a larger scale. The improvements were then implemented on a large class scale to determine the practicality and effectiveness of the media development. The final step was to evaluate the results of the implementation. Data analysis covered three aspects, namely validity, practicality, and effectiveness. Validity was obtained from the average scores of the validators' assessments, which were categorized according to criteria. Practicality was analyzed from the responses of teachers and students through the percentage of questionnaire results. Effectiveness was determined based on the N-gain calculation from the pretest-posttest results and observations of students' collaboration skills.

3. RESULT AND DISCUSSION

The results and discussion for the Development of Google Sites-Based Learning Media Using EduCanva include validation from media, material, and development experts, student learning outcomes, improvement in collaboration skills, and responses from teachers and students.

3.1 Validation of the Feasibility of the Learning Media Developed

The learning media developed, namely Google Sites web based on EduCanva, was validated by media, development, and material experts. The results of the feasibility validation by media experts, development experts, and material experts are described as follows.

3.1.1 Validation by Media Experts

Media validation was conducted by a Biology Education lecturer with the aim of measuring feasibility in eight aspects. The results of media validation are presented in Table 1.

Table 1. Results of Media Expert Validator

No.	Aspects Assessed	Assesment Indicators	Score
1.	Visual Display	Attractive, consistent, and unambiguous layout	3
2.	Readability	Font type, size, and text color are easy to read	3
3.	Image and Media Quality	Images/videos support the content, are clear, and relevant	4
4.	Interactivity	Interactive features/functions such as links, quizzes, or comments are available	4
5.	Navigation	Easy to use, with menus, buttons, and links that work well	3
6.	Compatibility	The site runs well on various devices (mobile phones, laptops) or browsers	3
7.	Media Suitability for Learning Objectives	Media supports increased collaboration and achievement of learning objectives	3
8.	Innovation and Appeal	Google Sites is used creatively and interestingly for studens	4

Based on the assessment results obtained from media experts on aspects such as visual appearance, readability, image and media quality, interactivity, navigation, compatibility, media suitability for learning objectives, innovation, and appeal, a score of 27 out of a maximum score of 32 was obtained. This score was then converted using the validity formula:

$$\mathbf{V = \frac{TSEV}{S-max} \text{ x } 100\% = \frac{27}{32} \text{ x } 100\% = 84{,}375\%}$$

The percentage obtained from the media expert assessment is 84.375%. According to the criteria, this score falls into the "highly valid" category. This indicates that the Google Sites-based learning media developed has met most of the eligibility criteria. High scores in the aspects of image quality, interactivity, and innovation indicate that the media is attractive, supports student engagement, and utilizes Google Sites features creatively. These findings are consistent with the research by Yanto et al. (2023), which also reported a validation result of 92.5% (highly valid category) for Google Sites-based media, with the note that the aspects of navigation and readability need to be improved for an optimal user experience [16]. Isnaini & Wahyuni (2022) also emphasized that visual quality and ease of navigation are important factors that determine the suitability of media and student learning comfort [17].

3.1.2 Expert Validation of Development

Development validation was conducted by one of the Biology Education lecturers with the aim of measuring feasibility in eight aspects. The results of media validation are presented in Table 2.

Table 2. Expert Development Validation Results

No.	Aspects Assessed	Assessment Indicators	Score
1.	Compliance with Development Model/Method	The media development process is in accordance with the ADDIE model	3
2.	Page Structure Integrity	The web page has an opening section, content, student activities, and a closing section	4
3.	Collaboration Integration	There are features/components that encourage student collaboration (such as comments or discussion forums)	3
4.	Relevance of Material	Biodiversity material is relevant to the characteristics of the agro-industrial region.	3
5.	Suitability with Learning Outcomes	Media supports applicable learning outcomes	3
6.	Practicality of Use	Teachers and students can easily acces and use the media	4
7.	Effective Use of Technology	Utilization of Google Sites features and integration with other technologies	4
8.	Functionality of All Components	No broken links, unplayable videos, or failed features	3

Based on the assessment results obtained from media development experts on aspects such as suitability with the development model/method, page structure integrity, collaborative integration, material relevance, suitability with learning outcomes, practicality of use, effective use of technology, and functionality of all components, a score of 27 out of a maximum score of 32 was obtained. This score was then converted using the validity formula:

$$\mathbf{V = \frac{TSEV}{S-max} \times 100\% = \frac{27}{32} \times 100\% = 84{,}375\%}$$

The percentage obtained from the media development expert assessment is 84.375%. According to the criteria, this value falls into the "highly valid" category. This is in line with research conducted by Fadjeri & Nurchayati (2022), which states that ICT-based learning media with a validation score of more than 80% can be categorized as highly valid and ready to be implemented in learning [18]. Similar findings were also shown by Sari et al. (2023), who reported that learning media with an average validation of 83% falls into the highly valid category and can increase student engagement [19]. This shows that the Google Sites-based media developed is in accordance with the ADDIE development model, is effective to use, and is able to facilitate student collaboration as intended by the research.

3.1.3 Content Expert Validation

Content validation was conducted by one of the Biology Education lecturers with the aim of measuring suitability in nine aspects. The results of media validation are presented in Table 3.

Table 3. Results of material Expert Validation

No.	Aspek Yang Dinilai	Indikator Penilaian	Score
1.	Curriculum Alignment	Materials are in line with the learning outcomes and level of the educational unit	4
2.	Accurary of Biological	The definition, types, and levels of biodiversity are presented scientifically and correctly.	3
3.	Completeness of Material	Includes genetic diversity, species, and ecosystems, as well as the causes and importance of conservation	4
4.	Depth of Material	Appropriate for the level of education, neither too shallow nor too complex.	4
5.	Contextualization and Relevance	Material linked to real-life examples	4
6.	Current Science	The material includes current issues such as the threat of species extinction, deforestation, or climate change	4
7.	Language and Terminology	The language is easy to understand, in accordance with scientific principles and the students' level.	4
8.	Ilustrations/Images	Accurate illustrations that support understanding and are appropriate for the material presented.	4
9.	Presentation of Examples	Providing concrete examples of the material that has been presented	4

Based on the assessment results obtained from media development experts on aspects such as suitability with the development model/method, page structure integrity, collaborative integration, material relevance, suitability with learning outcomes, practicality of use, effective use of technology, and functionality of all components, a score of 35 out of a maximum score of 36 was obtained. This score was then converted using the validity formula:

$$\mathbf{V = \frac{TSEV}{S-max} \times 100\% = \frac{35}{36} \times 100\% = 97{,}22\ \%}$$

The percentage obtained from the media development expert assessment is 97.22%. This value, when interpreted according to the criteria, falls into the "highly valid" category. The high score in the material expert validation shows that the content presented is in line with the curriculum, correct biological concepts, and comprehensively covers genetic diversity, species, ecosystems, and the agro-industrial context. This finding is in line with research by Fadjeri & Nurchayati (2022), which reported that media with a validity of above 80% is

categorized as highly valid and ready for implementation. Another study by Wulandari et al. (2023) on the development of Powtoon-based animated videos also obtained 97% subject matter expert validation and concluded that the media was very suitable for use in learning [19]. Thus, it can be concluded that the material contained in this media has been scientifically and contextually tested and is ready for use in learning in agro industrial areas.

3.2 Student Learning Outcomes

Student learning outcomes include pretest and posttest scores used to prove that the Google Sites-based EduCanva learning media developed is effective. These learning outcomes were assessed in 30 students in class X at MA Mambaul Ulum Probolinggo. Student learning outcomes are presented in Table 4.

Table 4. Student Learning Outcomes

No.	Aspect	MMC ≥75	Percentage
1.	Pre-test	17 students	56,67%
2.	Post-test	25 sstudents	83,33%

Based on student learning outcomes, including pre-tests and post-tests, these can be entered into the N-Gain formula to make the results more significant.

$$g = \frac{T'1 - T1}{Tmaks - T'1} = \frac{80\% - 56{,}67\%}{100\% - 56{,}67\%} = 0{,}5385$$

After calculations were performed, the result was 0.5385, which falls into the "moderate" category. Similar findings were also reported by Brigita & Siregar (2022), supporting these results, where Canva-based media was able to improve learning outcomes with an N-Gain of 0.64 (moderate category) [20]. Thus, these findings reinforce that the EduCanva-based web learning media developed is effective in improving student learning outcomes on biodiversity material, especially in schools located in agro-industrial areas.

3.3. Improvement in Collaboration Skills

The development of this learning media is used not only to measure students' cognitive abilities, but also to measure improvements in their collaboration skills. This measurement was conducted in two cycles, namely during the first and second meetings. The results of the improvement in collaboration skills are presented in Table 5.

Table 5. Improvement in Collaboration Skills

No.	Indicator	Cycle 1		Cycle 2		Improvement
		Percentage	Criteria	Percentage	Criteria	
1.	Responsibility for completing work	70%	Fairly Good	80%	Good	10%
2.	Compromise	55%	Not Good	80%	Good	25%
3.	Working productively	79,17%	Good	81,67%	Good	2,5%
4.	Adapting to various roles	69,17%	Fairly Good	79,17%	Good	10%
	Average	68,83%	Fairly Good	80,21%	Good	11,38%

Based on the results of observations of 30 students, it was found that there was an increase in students' collaboration skills from cycle 1 to cycle 2 of 11.38%. The overall average in cycle 1 was 68.83%, which can be categorized as "fairly good." Then, in cycle two, there was an increase to a percentage of 80.21%, which can be categorized as "good." Similar findings were also reported by Husmia et al. (2024), who found that the use of media-assisted problem-based learning significantly improved the collaboration skills of junior high school students in each learning cycle [21]. Thus, it can be concluded that the development of Google Sites-based EduCanva learning media not only helps achieve cognitive aspects but also contributes positively to improving students' collaboration skills in agro-industrial schools.

3.4. Teacher and Student Responses to the Development of Google Sites Web-based EduCanva

Teacher and student responses were used to determine the feedback of students and teachers on the developed learning media. The data on student and teacher responses are described as follows.

3.4.1 Teacher Responses

Teacher responses were collected from one biology teacher at MA Mambaul Ulum Probolinggo. The results of teacher responses to the media are presented in Table 6.

Table 6. Teacher Response Results

No.	Aspects Assessed	SS	S	KS	TS
1.	This learning media is in line with the learning outcomes and objectives of biology.	√			
2.	The content and page structure of the media are organized clearly and systematically.	√			
3.	The media supports collaborative and participatory learning activities.	√			
4.	Students show enthusiasm and engagement when using media	√			
5.	The use of Google Sites and Canva in this media is highly relevant to 21st-century learning.	√			
6.	I am interested in using or recommending this media in other learning contexts	√			
	Total Score	30			

Based on the teachers' responses to the development of the teaching media that has been implemented in the 10th grade at MA Mambaul Ulum, the score obtained is 30 out of a maximum score of 30. This score is then converted using the following formula:

$$\mathbf{P = \frac{TSr}{TSh}\ x\ 100\% = \frac{30}{30}\ x\ 100\% = 100\%}$$

The percentage results from the practicality data obtained a result of 100%, which when interpreted means it is in the "very practical" category. This result is in line with the research by Hidayatillah, Wisudaningsih, & Pratama (2020), which reported that Google Sites-based interactive learning media received a 94% response from teachers (very practical category) [22]. Research by Sofiasyari, Amanaturrakhmah, & Yuliyanto (2021) also found that interactive video-based social studies teaching media received an 88% response from teachers (very practical category) [23]. The consistency of these results reinforces that Google Sites and EduCanva-based interactive digital media are very feasible and practical to use in the 21st-century learning process.

3.4.2 Student Responses

The student response was conducted on 30 tenth-grade students at MA Mambaul Ulum Probolinggo. The results of the student interviews are summarized in the following two points:

a. The learning media display was excellent and the material presentation was very comprehensive. There were videos, learning materials, and evaluation games, making it very interesting and enjoyable so that the material was easier to understand.
b. There were a few obstacles experienced by students, namely difficulties in operating laptops because the school is located in an Islamic boarding school area, resulting in limited knowledge of technology, especially the use of laptops.

Meanwhile, the results of student responses to the Google Sites web-based learning media using EduCanva, as measures by the questionnaire, are presented in Table 7.

Table 7. Student Response Results

Aspect	Maximum Score	Acquisition Score
Total Score	1.050	968
Average Student Response (%)	92,29%	
Category	Very Practical	

Student responses to the Google Sites-based EduCanva learning media showed a total score of 968 out of a maximum of 1,050, or an average of 92.29% in the "very practical" category. These results indicate that students rated the media display as very good and the material presentation as complete, despite minor technical issues with laptop usage. These findings are in line with the research by Khansa Rofifah, Nur Fajrie, & Diana Ermawati (2022), which reported student responses to local wisdom-based digital modules at 91% and categorized

them as very positive [24]. Padlet research by Mubarokah & Huda (2021) also found a student response rate of around 82%, which is considered very positive. The consistency of these results reinforces that interactive digital media truly has a high level of practicality from the students' perspective [25].

4. CONCLUSION

This study concludes that the development of Google Sites-based learning media integrated with EduCanva has been proven to be valid, practical, and effective in supporting school learning in agro-industrial areas. Expert validation results showed scores of 97.22% from subject matter experts, 84.375% from media experts, and 84.375% from development experts, all of which were categorized as highly valid. The practicality test obtained a 100% response from teachers and a 92.29% response from students, both of which were categorized as very practical. The effectiveness test showed an increase in learning outcomes with an N-gain value of 0.53 (moderate category) and an increase in student collaboration skills of 11.38% from cycle I to cycle II, which was from the sufficient category to the good category. Thus, the developed media is not only capable of improving material comprehension but also contributes to fostering collaboration skills as one of the key competencies of the 21st century. Practically, the results of this study show the potential for widespread adoption in schools in agro industrial areas as an alternative to collaboration-based digital learning media. In addition, this media contributes to strengthening the implementation of the biology curriculum, which emphasizes mastery of concepts, the development pf 21st-century skills, and relevance to the local agro-industrial context.

5. ACKNOWLEDGEMENT

This journal article is based on research funded by the Research and Community Service Group Grant (Keris Dimas) contract number 2600/UN25.3.1/LT/2025, based on the Rector of Jember University Decree number 6274/UN25/KP/2025 dated March 17, 2025.**]**

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