



## The Effectiveness of the Gobak Sodor Digital Encyclopedia on Cultural Preservation and Student Learning Outcomes

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### Abstract

**Studi purpose.** Traditional games are a cultural heritage rich in educational value, one of which is Gobak Sodor. However, technological developments have led to traditional games being increasingly abandoned. This study aims to develop and test the effectiveness of the Gobak Sodor Digital Encyclopedia (Gocir Pedia) in preserving culture while improving student learning outcomes.

**Materials and methods.** The research method used the ADDIE (Analyse, Design, Development, Implementation, Evaluation) development model. Product validation involved three expert validators (physical education, learning technology, and digital media). Research instruments included (1) expert validation, (2) learning outcome tests (pre-test and post-test) using the digital encyclopaedia, (3) observation sheets and interviews. The population and sample consisted of all 20 students taking traditional learning courses. Data analysis techniques used quantitative and qualitative methods: (a) analysed using the Content Validity Index (CVI), (b) N-Gain, and (c) t-test. Qualitative data consisted of comments from experts and students after using the product.

**Results.** The average research result was 91.8% (excellent category). A limited trial was conducted on 20 Physical Education, Health, and Recreation students. The test results showed an average pretest score of 9.35 and a posttest score of 17.45, with an N-Gain of 0.78 (high category). The paired t-test showed a significant difference ( $t = 42.50$ ;  $p < 0.05$ ).

**Conclusion.** Thus, this digital encyclopaedia is effective as an educational medium and a means of preserving the traditional Gobak Sodor sports culture.

**Keywords:** Digitalisation, Gobak Sodor, Digital Encyclopaedia, Learning Outcomes, Culture.

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### Introduction

The development of digital technology has brought significant changes to the world of education, including efforts to preserve local culture. Traditional games such as Gobak Sodor

are beginning to be abandoned by the younger generation due to the dominance of modern digital-based games. In fact, traditional games have social, sporting and cooperative values that are important to develop in students (Cheong & Hussain, 2024; S., Nasirun, & D., 2020). The use of digital media such as interactive digital encyclopaedias can be an innovative solution for combining cultural values with technology-based learning. According to (Asmah & Stih, 2022; Khasanah & Pd, 2024) the use of digital media in learning significantly increases student motivation and learning outcomes (Siregar et al., 2024). Therefore, this study focuses on the effectiveness of the Gobak Sodor Digital Encyclopedia on cultural preservation and student learning outcomes. This phenomenon raises concerns that the cultural values contained in traditional games will be lost. (Morejón Calixto, Mayanza Paucar, Barcia Maridueña, & Vásquez Alvarado, 2024; Satriawan, Amar, & Fitriani, 2023) states that traditional games are increasingly rarely played by children and adolescents, even though these games play an important role in shaping social, emotional, and cognitive skills. The loss of traditional games means the loss of a valuable part of cultural identity.

Digitalisation offers opportunities to address these challenges. By utilising digital technology, traditional games can be documented, repackaged, and presented in a more appealing manner. Digitalisation enables younger generations to remain connected to their cultural roots through media that suits their lifestyle (Haleem, Javaid, Qadri, & Suman, 2022). (Muhamad Faizal, Nurhasanah, & Rahmawati, 2023) For example, successfully digitising the traditional game of Galah through gaming media has been proven to increase interest among the younger generation. This proves that digital media can be an effective means of preserving culture while also improving learning outcomes. In addition to cultural preservation, traditional games can also be utilised in the context of formal education. Gobak Sodor, for example, can be incorporated into physical education lessons. This game not only trains the body, but also teaches the values of cooperation and sportsmanship. However, without the appropriate media, students will find it difficult to understand the rules and philosophy of the game. Therefore, digital learning media that can present information in a comprehensive, interesting, and accessible manner is needed.

Several previous studies have demonstrated the effectiveness of using local culture-based media in education. (Diah Asparini, Sukra Warpala, Bagus, & Arnyana, 2025) found that local culture-based multimedia learning can improve students' understanding while strengthening their attachment to culture. (Rodiyah, Fijriyah, & Adinanda, 2025) adding that the development of local culture-based digital media is urgently needed to ensure that younger generations continue to recognise and love their culture. However, research specifically focused on developing a digital encyclopaedia about Gobak Sodor is still rare. Most of it is in the form of simple documentation or games, with no comprehensive digital encyclopaedia offering complete content.

## Materials and Methods

### Study participants

The research subjects were 20 students from the Physical Education, Health, and Recreation Study Programme at the University of 17 August 1945 Cirebon who took traditional sports learning courses. The research instruments included: (1) expert validation sheets, which were used to assess product feasibility based on content, appearance, and usefulness; (2) a learning outcome test in the form of multiple-choice questions (20 items), administered before (pre-test) and after (post-test) the use of the digital encyclopaedia; and (3) observation sheets and interviews to obtain qualitative responses from students.

### **Study organization**

This study utilised a research and development approach with the ADDIE model (Analyse, Design, Development, Implementation, Evaluation). This model was chosen because it provides a systematic and proven framework for designing, developing, implementing, and evaluating learning products.

### **Statistical analysis**

The research data was analysed quantitatively and qualitatively. Quantitative data included: (a) expert validation, analysed using the Content Validity Index (CVI) in percentage form; (b) student learning outcomes, analysed using the average pretest and posttest scores and improvement calculated using N-Gain; and (c) paired t-tests to determine the significance of the difference between pretest and posttest scores. Qualitative data was used to reinforce the interpretation, in the form of expert comments and student experiences using the product.

## **Results**

This section discusses the research results based on the Analyse, Design, Development, Implementation, and Evaluation (ADDIE) stages.

### **1. Analyse (Needs Analysis)**

The results of the needs analysis show that the majority of students at the University of 17 August 1945 Cirebon are unfamiliar with the rules, history, and philosophy of Gobak Sodor. They are more familiar with modern digital games. Students want learning media that includes history, game rules, strategies, cultural values, and visual documentation in the form of photos and illustrations.

This indicates the need for comprehensive, structured, and engaging digital media. A digital encyclopaedia is considered appropriate because it presents complete information in an interactive format. This product is expected to fill the knowledge gap among students and revive interest in traditional games.

### **2. Design (Product Design)**

The design of the digital encyclopaedia covers five main sections: (1) introduction, (2) history of Gobak Sodor, (3) rules of the game, (4) field implementation, and (5) references. The product is designed with a simple interface, interactive navigation, and is equipped with illustrations and photos. To view the finished Gobak Sodor digital encyclopaedia product, visit <https://gocirpedia.edusains.web.id/>.

This design emphasises user-friendly and responsive principles. This is important because the majority of students use mobile phones in their learning activities. A simple yet attractive display helps students understand the content without technical barriers, demonstrating that multimedia based on local culture increases student motivation and understanding. ([Warananingtyas Palupi, Agus Cahyono, Wayan Adnyana, 2022](#)) also found that cultural digitisation can attract the interest of younger generations. Therefore, the Gocir Pedia project is in line with the trend of developing media based on local culture.

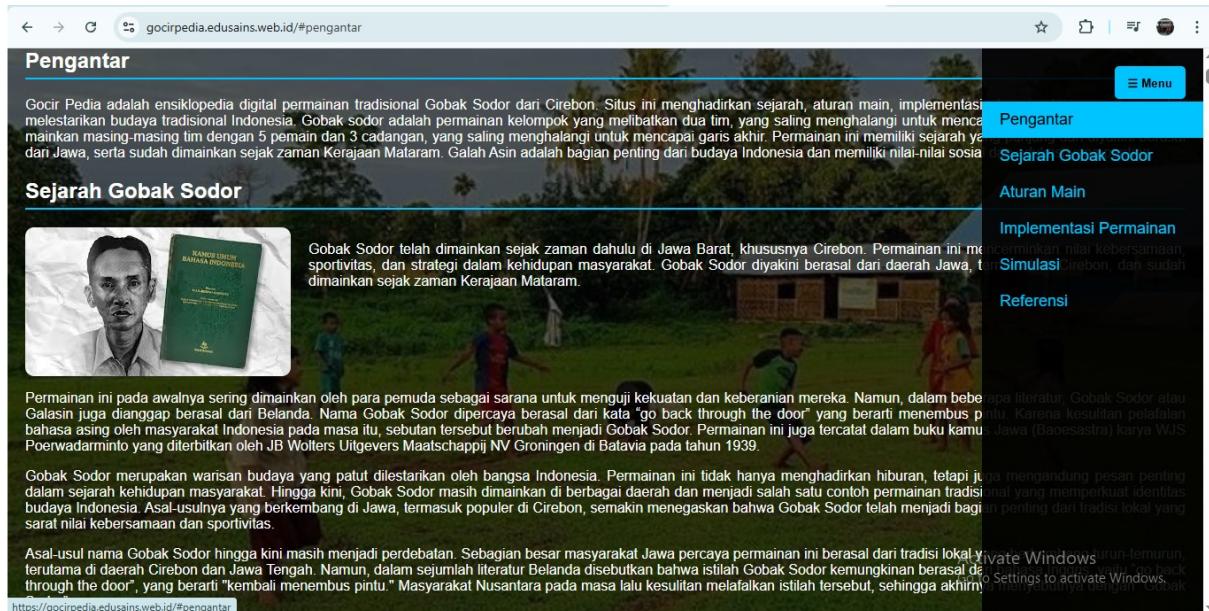


Figure 1. Introduction

This page of the Gocir Pedia application Figure 1 displays introductory information about the traditional game of Gobak Sodor, which originated in Cirebon. At the beginning, there is a title, 'Introduction,' which explains that this site is a digital encyclopaedia created to preserve traditional Indonesian culture through the presentation of the history, rules, implementation, and simulation of the game of Gobak Sodor. The main content of this page contains a description of the origins of Gobak Sodor as a group game involving two teams with the aim of blocking each other from reaching the finish line, as well as an explanation that this game has existed since the Mataram Kingdom era.

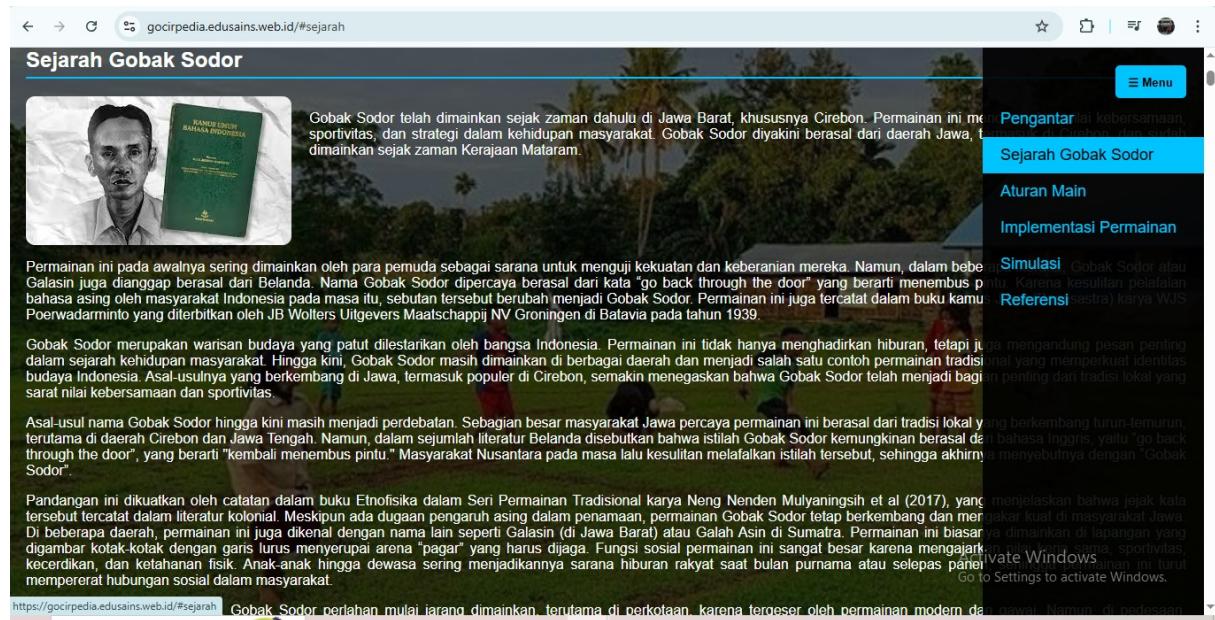


Figure 2. History page of Obak Sodor

The Gocir Pedia application page shown in Figure 2. This page specifically contains a description of the origins, development, and meaning of the traditional game of Gobak Sodor as part of Indonesian culture. The main content of the page is presented in several paragraphs.

The first paragraph explains that Gobak Sodor was originally played by young men as a means of testing their strength and courage. It also mentions the influence of the Dutch phrase ‘go back through the door’, which later became Gobak Sodor, as well as its recording in old literature such as the dictionary by WJS Poerwadarminta in 1939. The following paragraph emphasises that Gobak Sodor is a cultural heritage that reflects the identity of the Indonesian nation, especially in terms of the values of togetherness and sportsmanship.



Figure 3. Rules

The Gocir Pedia application page shown in Figure 3 is titled ‘Rules of the Game’. This page contains a complete explanation of the rules of the traditional game of Gobak Sodor, from the number of players and the shape of the field to the technical rules of the game. At the top left of the page is an illustration of a rectangular Gobak Sodor field divided into six squares, along with the positions of the players from the two teams, the referee, the scorekeeper, and the line judge. This illustration makes it easy for readers to understand the pattern of the game and the placement of players on the field.

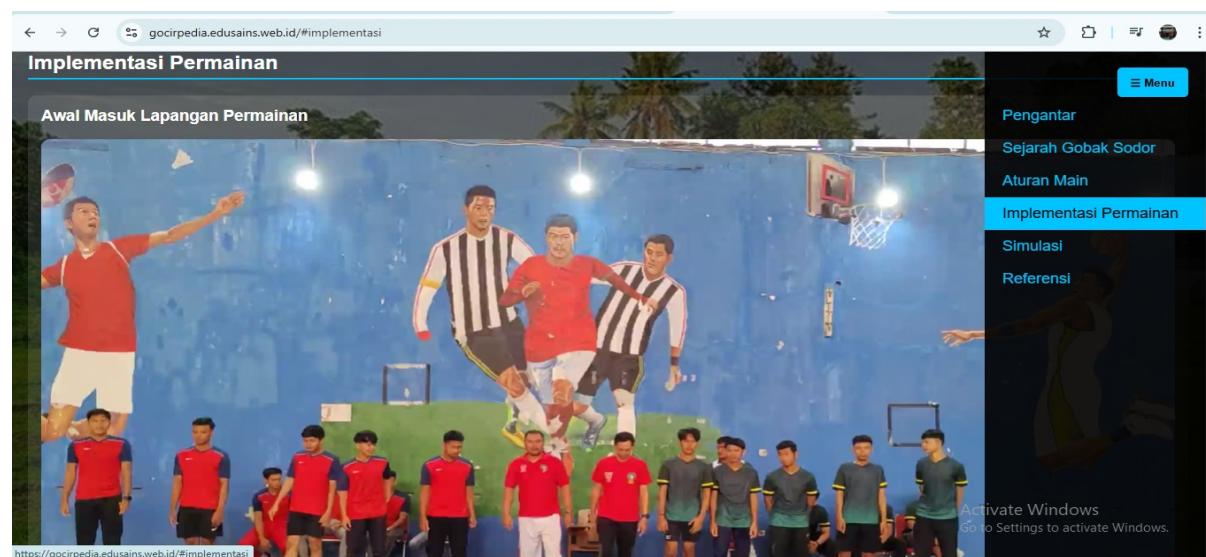


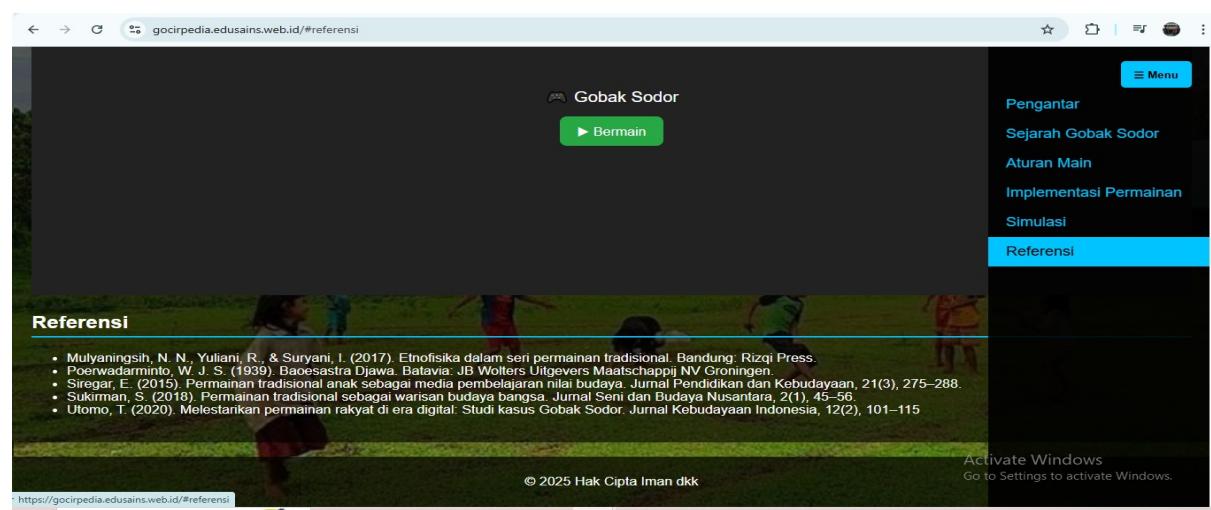
Figure 4. Game Implementation

The Gocir Pedia application page shown in [Figure 4](#) is titled ‘Game Implementation’. This section serves to show the actual implementation of the traditional game of Gobak Sodor through documentation of activities in the field. At the top of the page is the large title ‘Game Implementation’ with the subtitle ‘Entering the Playing Field’, which marks the initial stage of the game. Directly below is a large photo showing a group of players wearing uniforms lined up on the sports field. The background wall of the field features a mural of football players with a predominantly blue colour, adding a sporty and eye-catching impression.



[Figure 5.](#) Gobak Sodor Game Simulation

Gocir Pedia, shown in [Figure 5](#), is titled ‘Gobak Sodor Simulation’. This section is designed as an interactive medium that allows users to experience playing Gobak Sodor digitally. The main area of the page displays a square-shaped playing field that resembles the original Gobak Sodor field. Inside the field, there are animations of player characters. One character is seen running as an attacker, while several other characters act as line guards who block the attacker from crossing the playing field.



[Figure 6.](#) References

The application page shown in [Figure 6](#) is the ‘References’ section of the Gocirpedia website, which contains bibliographic sources related to the traditional game of Gobak Sodor.

### 3. Development (Product Development)

The product is developed based on the web. Validation is carried out by three experts: physical education experts, learning technology experts, and digital media experts can be seen in [Table 1](#).

**Table 1.** Expert Validation Results

Validator	Content	Display	Feasibility	Average (%)
Ahli 1	92	90	93	91,7
Ahli 2	89	94	92	91,7
Ahli 3	93	91	92	92
<b>Average</b>				<b>91,8</b>

The product obtained an average validation score of 91.8% with an excellent rating. The content was deemed relevant, the appearance appealing, and the suitability high. This indicates that the product is ready for use without major revisions.

### 4. Implementation (Limited Field Trial)

The product was tested on 20 students with a pretest and posttest as shown in [Table 2](#).

**Table 2.** Student N-Gain Calculation Results

No	Student	Pretest	Posttest	N-Gain	Category
1	Student 1	10	19	0,82	High
2	Student 2	9	17	0,73	High
3	Student 3	11	20	0,82	High
4	Student 4	12	18	0,75	High
5	Student 5	8	15	0,58	Moderate
6	Student 6	7	14	0,54	Moderate
7	Student 7	12	20	0,89	High
8	Student 8	11	19	0,8	High
9	Student 9	10	18	0,8	High
10	Student 10	6	13	0,47	Moderate
11	Student 11	8	16	0,67	Moderate
12	Student 12	9	18	0,82	High
13	Student 13	11	20	0,82	High
14	Student 14	7	15	0,62	Moderate
15	Student 15	8	17	0,75	High
16	Student 16	10	19	0,82	High
17	Student 17	9	17	0,73	High
18	Student 18	12	20	0,89	High
19	Student 19	9	18	0,82	High
20	Student 20	8	16	0,67	Moderate

The average score increased from 9.35 to 17.45. The N-Gain value of 0.78 is considered high. Students provided positive feedback, rating the product as accessible, clear, and useful for reacquainting themselves with traditional games.

### 5. Evaluation

Effectiveness was tested using a paired t-test, as shown in [Table 3](#).

**Table 3.** Paired T-test Results

Statistic	Value
Sample Size (N)	20
Pre-test Average	9,35
Post-test Average	17,45
Calculated t-value	42,5
Degrees of Freedom (df)	19
p-value (Sig. 2-tailed)	0,000 ( $p < 0,05$ )

The t-test results showed a significant difference between the pretest and posttest ( $p < 0.05$ ). This means that digital encyclopaedias are effective in improving student learning outcomes. Students also felt that the product was useful for preserving culture.

## Discussion

The results of the needs analysis show that the majority of students at the University of 17 August 1945 Cirebon are unfamiliar with the rules, history, and philosophy of Gobak Sodor. They are more familiar with modern digital games. Students expect learning media that contains the history, rules of the game, strategies, cultural values, and visual documentation in the form of photos and illustrations. This indicates the need for comprehensive, structured, and interesting digital media. A digital encyclopaedia is considered appropriate because it presents complete information in an interactive format. This product is expected to fill the knowledge gap among students and revive their interest in traditional games. These analysis results are in line with research ([Satriawan et al., 2023](#)) which emphasises the importance of traditional games in shaping children's character. ([Rodiyah et al., 2025](#)) also found that local culture-based digital media is very important for maintaining young people's interest in culture. Thus, this needs analysis reinforces the urgency of developing Gocir Pedia.

The design of the digital encyclopaedia comprises five main sections: (1) introduction, (2) history of Gobak Sodor, (3) rules of the game, (4) field implementation, and (5) references. The product is designed with a simple interface, interactive navigation, and is equipped with illustrations and photographs. This design emphasises user-friendly and responsive principles. This is important because the majority of students use mobile phones in their learning activities. A simple but attractive display helps students understand the content without technical barriers. This shows that multimedia based on local culture increases student motivation and understanding. ([Warananingtyas Palupi, Agus Cahyono, Wayan Adnyana, 2022](#)) also found that cultural digitisation can attract the interest of younger generations. Therefore, the Gocir Pedia project is in line with the trend of developing media based on local culture.

The product obtained an average validation score of 91.8% with a rating of excellent. The content was assessed as relevant, visually appealing, and highly feasible. This indicates that the product is ready for use without major revisions. These results support the findings ([Muhamad Faizal et al., 2023](#)) that the digitisation of traditional games through interactive media has high validity. Research ([Permadi, Sonjaya, Hafiz, 2023](#)) also shows that revitalising traditional games through digital media can preserve cultural sustainability.

The average score increased from 9.35 to 17.45. The N-Gain value of 0.78 is considered high. Students provided positive feedback, rating the product as accessible, clear, and useful for reacquainting themselves with traditional games. These results are consistent with (Yusnia, Debi Heryanto, Neza Agusdianita, 2024) which reported that interactive media based on local culture significantly improved learning outcomes. (Astini, Rachmayani, Nurhasanah, & Zakiyah, 2022) also found that traditional games can be used as an effective learning resource. The t-test results showed a significant difference between the pretest and posttest ( $p < 0.05$ ). This means that digital encyclopaedias are effective in improving student learning outcomes. Students also felt that the product was useful for preserving culture. (Berliana Sava & Harianto, 2024) stating that traditional games are still relevant if packaged in a modern form. (Branch, 2010) also emphasises the effectiveness of the ADDIE model in producing development products.

## Conclusions

The Gobak Sodor Digital Encyclopedia (Gocir Pedia) has been proven to be valid, feasible, and effective. Needs analysis shows that the main relevant content is the history, rules, and cultural values of Gobak Sodor. The product design presents a simple structure with interactive navigation features. Expert validation shows an excellent rating (91.8%). Implementation among students shows a significant improvement with an average N-Gain of 0.78 (high category). Evaluation through a paired t-test confirms the effectiveness of the product.

This product is recommended for further development in the form of a mobile application and integration into the education curriculum for optimal cultural preservation.

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