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## Development of CEKATAN: A Crossword Puzzle-Based Learning Media to Enhance Literacy Skills in Grade 2 Elementary School Students

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Abstract: This study aims to develop CEKATAN learning media, a crossword puzzle-based media with fable content, to improve the literacy skills of secondgrade elementary school students. The research employed Research and Development (R&D) with a modified Borg & Gall model up to the limited trial stage. The participants were students from both experimental and control classes at Wringinputih 01 Public Elementary School, Semarang Regency. Research instruments included validation sheets from experts, teacher and student questionnaires, and literacy tests in the form of pretest and posttest. Data were analyzed using descriptive statistics to measure validity and practicality, and inferential statistics (normality, homogeneity, t-test, and N-Gain) to measure effectiveness. Validation results indicated that CEKATAN media was highly valid, with material experts rating it at 93.3% and media experts at 90.6%. Practicality was rated very high by both teachers (92.7%) and students (94.2%). Effectiveness tests showed significant differences between the experimental and control classes (Sig. 0.000 < 0.05). The N-Gain score for the experimental class was 0.84 (high category), while the control class obtained 0.40 (moderate category). These findings demonstrate that CEKATAN media is valid, practical, and effective, making it suitable to be applied in elementary school literacy learning. These findings further imply that CEKATAN media has the potential to support school literacy programs and can be implemented more broadly in elementary education as a sustainable approach to fostering students' reading interest and comprehension.

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#### Introduction

Basic literacy is a fundamental skill that forms the foundation for student success in elementary school. However, the literacy achievement of Indonesian students remains a serious concern. The PISA 2018 report placed Indonesia in the bottom 10 countries for reading literacy, indicating that many students struggle with comprehension and critical thinking skills. This condition is also reflected in local contexts. Preliminary observations at Wringinputih 01 Public Elementary School, Semarang Regency, showed that more than half of second-grade students have difficulty understanding simple fable texts and lack interest in reading activities. This highlights the urgent need for innovative strategies to foster literacy skills from the lower grades of elementary school.

One solution that has been extensively researched is the use of educational game-based learning media. Fitriani et al. (2021) found that Android-based educational games can enhance cognitive skills. Wahyudi and Pratiwi (2022) also emphasize that game-based media create a fun learning environment. Interactive educational games have been proven to increase elementary school students' motivation to learn (Ningsih & Utami, 2020). Additionally, Sari (2021) adds that educational games provide enjoyable learning experiences

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and have a positive impact on learning outcomes. Furthermore, the development of game-based media has proven effective in accounting and science education (Kusuma & Handayani, 2021).

Among educational game media, Crossword Puzzles (TTS) hold a unique position. Fauziyah et al. (2023) demonstrate that TTS can enhance critical thinking skills. Pratiwi's (2022) research proves the effectiveness of interactive TTS in thematic learning, while Siagian and Sapri (2025) highlight the benefits of illustrated TTS in improving students' reading skills. Other research also supports that TTS encourages elementary school students' interest in learning (Rahmawati, 2021). Siregar (2022) found that TTS plays a role in improving cognitive outcomes and strengthening students' understanding of basic concepts.

In addition to games, the use of fables has also gained attention as a literacy teaching material. Yulianti's (2022) research found that literacy-based fables improve reading skills while instilling character values. Similar research shows that fables are effective in fostering reading interest among elementary school students (Hidayati & Sulaiman, 2021). However, most previous studies investigated crossword puzzles and fables separately, without integrating them into a single learning medium. Furthermore, limited research has developed crossword puzzle-based media specifically tailored to lower-grade elementary students while incorporating character values such as the Pancasila Student Profile.

Therefore, this study aims to develop CEKATAN learning media that combines crossword puzzles with fable stories to improve the literacy skills of second-grade elementary school students. It is expected that this media not only enhances students' reading comprehension and motivation but also provides teachers with an innovative and enjoyable alternative to conventional literacy instruction, supporting the implementation of literacy programs at the elementary school level.

### **Research Method**

This study used a Research and Development (R&D) approach with the Borg and Gall model. This model was chosen because it is suitable for developing learning media that has been tested for validity, practicality, and effectiveness (Sugiyono, 2017). Previous research on the development of crossword puzzle media has been proven to improve the learning outcomes of elementary school students (Astuti & Yunianta, 2021). Based on these findings, the research design focused on creating educational game-based learning media that could support improvements in student literacy.

The research subjects were 41 second-grade students (aged 7–8 years) from Wringinputih 01 Public Elementary School, Semarang Regency, consisting of 20 students in the experimental class (using CEKATAN media) and 21 students in the control class (using conventional methods). The subjects were selected using purposive sampling, considering that they were active second-grade students without reported learning difficulties, as also applied in Pratiwi's (2022) study on interactive crossword puzzle media.

The research instruments included expert validation sheets for the media and materials, student response questionnaires, and pre- and post-tests. Data collection techniques involved observation, documentation, questionnaire distribution, and pre- and post-tests. In line with research on the development of literacy-based fable teaching materials, these instruments were used to assess the quality of the product in terms of validity, practicality, and effectiveness (Yulianti, 2022).

Data were analyzed using quantitative and qualitative approaches. Product validity was calculated using the average score from expert validators, media practicality was measured through the percentage of student and teacher responses, and effectiveness was

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analyzed using normality tests, homogeneity tests, independent sample t-tests, and N-Gain calculations. In addition, qualitative data from teacher observations, student response questionnaires, and field notes were analyzed descriptively to identify patterns of student engagement, challenges during implementation, and perceptions of the CEKATAN media. Rahmawati (2021) states that normality tests, homogeneity tests, t-tests, and N-Gain are appropriate analysis techniques for assessing the effectiveness of crossword puzzles in learning.

Therefore, this study also uses these analysis techniques to determine the effectiveness of the CEKATAN media in improving student literacy. Statistical analysis was used to support the results of the media effectiveness test, so that a significant increase in student literacy between the experimental and control classes could be observed. Sari and Widodo (2020) revealed that educational game-based media can increase student motivation and learning outcomes. Based on these findings, this study integrated educational game elements into the CEKATAN media to make it more interesting and able to foster student interest in learning.

# Results and Discussion Definition Stage

The define stage was conducted to identify problems in learning Indonesian in second grade elementary school, particularly in fable stories. Based on initial observations, it was found that students' literacy skills were still low; 24.39% of students were unable to read well and 53.66% were unable to fully understand the text. Additionally, students' interest in fables is also low (73% of students are uninterested), which impacts their literacy outcomes. A needs analysis indicates the necessity for innovative, game-based learning media to encourage students to be more active, motivated, and able to understand the moral messages in fables.

#### **Design Stage**

The media design was carried out by developing the CEKATAN (Crossword Puzzle Stories on Pancasila Student Profiles) media concept. The media design includes:

- a) Content structure: Fables are selected in accordance with the curriculum and combined with crossword puzzles that contain moral messages and Pancasila Student Profile values
- b) Question presentation: Crossword puzzles are designed based on the content of the fables that students have read, so that the answers must be related to the reading text.
- c) Visualization: The media is designed in the form of an illustrated book with an attractive and colorful appearance to suit the characteristics of second-grade elementary school students.
- d) Evaluation instruments: Pretest-posttest question grids, student response questionnaires, teacher observations, and teacher interviews are prepared to assess the validity, practicality, and effectiveness of the media.

The final result of the design stage is a storyboard that serves as a guideline for the creation of CEKATAN media. The storyboard includes the plot of the fable, the arrangement of crossword puzzles, visual layout, color choices, supporting images, and instructions for completing the puzzles. Each page is designed to display the story text, illustrations, and interconnected crossword puzzle boxes with questions referencing the reading content. This design document is then used as a reference during the development phase, which involves creating the CEKATAN media in the form of an attractive, colorful printed product tailored to the characteristics of second-grade elementary school students.

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Figure 1. CEKATAN Product Design

## **Development Stage**

The development stage of the CEKATAN product began with the creation of learning modules that combine five fables with crossword puzzles. Each story is designed to suit the characteristics of second-grade elementary school students, using simple language, easy-to-understand vocabulary, colorful illustrations, and storylines that contain moral values. In addition to improving reading literacy, the story content is integrated with the values of the Pancasila Student Profile, such as honesty, independence, cooperation, and critical thinking. At the end of each story, students were presented with a crossword puzzle containing horizontal and vertical questions based on the reading material, allowing them to review their understanding, recognize characters, and reinforce their mastery of new vocabulary in an enjoyable way.

The initial product was then validated by subject matter experts and media experts. The CEKATAN learning media was validated and tested with the involvement of teachers and students. The validation process was carried out by subject matter experts and media experts to assess the suitability of the product before it was used more widely. Subsequently, field trials were conducted to evaluate the practicality of the media when used in literacy learning.

Table 1. Results of the Media Expert Validation Stage

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Aspect	Sc	ore	Cotogowy	
	Val.1	Val.2	Category	
Cover Design	14	15	Very Valid	
Interior Design	23	25	Very Valid	
Layout	25	25	Very Valid	
TTS	14	13	Very Valid	
Feasibility	15	15	Very Valid	
Total	91	93	Very Valid	
Results	95,78%	97,89 %	Very Valid	

Based on the table, the average percentage of material expert validation reached 97.73% with a Very Valid category. This means that in terms of content, the media is appropriate for the competency level, easy to understand, and relevant to the learning objectives of second-grade elementary school students.

Table 2. Results from the Expert Validation Stage

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Aspect	Score		Catagamy		
	Val.1	Val.2	Category		
Content	32	35	Very Valid		
Language	25	24	Very Valid		
Illustrations	20	20	Very Valid		
TTS	15	14	Very Valid		

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Feasibility	15	15	Very Valid
Total	107	108	Very Valid
Results	97,27%	98,18 %	Very Valid

Based on the table, the average percentage of media expert validation reached 96.83% with a Very Valid category. This shows that CEKATAN media is very good in terms of visual design, layout, and display feasibility, making it attractive and easy for students to use.

## **Disseminate Stage**

Based on the validation results conducted by subject matter experts and media experts, the CEKATAN learning media obtained an average score in the highly valid category, thus deemed suitable for use in the learning process. These results indicate that the media meets the standards for content, language, illustrations, design, and technical feasibility, allowing it to proceed to the next stage. Therefore, this study then entered the field trial stage, which aimed to determine the effectiveness of the media in improving student learning outcomes and to assess student responses to the attractiveness and usefulness of the media when used in classroom learning.

The field trial of the CEKATAN media was conducted at SDN Wringinputih 01 with 22 students. The purpose of this trial was to determine the effectiveness of the media in improving learning outcomes and to observe students' responses to the attractiveness and usefulness of the media.

**Table 3. Student Response Results** 

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No Activity	Class	Maximum	Minimum	Total	Presentase		
		Score	Score	Value	Fiesemase		
1	Pretest	A (control)	70	10	905	47,63%	
2	Posttest	A (control)	100	50	1295	68,15%	
3	Pretest	B (Experiment)	25	85	1155	52,50%	
4	Posttes	B (Experiment)	75	100	1995	90,68%	

The learning outcomes showed a significant increase in student scores. The average pretest score was 52.50%, which increased to 90.68% on the posttest. This increase was much higher than that of the control class (2A), which did not use the CEKATAN media, where the pretest score only increased from 47.63% to 68.15% on the posttest. These results prove that the CEKATAN media is more effective than conventional teaching methods in helping students understand the content of fables.

Additionally, student responses to the media were obtained through an appeal questionnaire. The average student rating reached 89.27%, categorized as suitable for use. Most students stated that the media was interesting because it was packaged with fables that were close to everyday life and challenging crossword puzzles. However, there were some difficulties for some students who found it challenging to fill in the crossword puzzle answers when the vocabulary of the story was not yet fully understood. Nevertheless, this encouraged students to be more active in asking questions and discussing with peers and teachers, thereby making the learning interaction more lively.

The pretest and posttest data were further tested using a normality test to ensure normal data distribution, a homogeneity test to determine the similarity of variances between groups, and a Paired Sample T-Test to see significant differences between pretest and posttest scores. In addition, N-Gain calculations were performed to determine the level of effectiveness of learning improvement in the experimental class compared to the control class. Through these stages, it can be proven that the CEKATAN media is capable of significantly improving students' literacy skills.

The results of the normality test using the Shapiro-Wilk method showed that all data, both in the control class and the experimental class, had a significance value greater than

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0.05, so it can be concluded that the data is normally distributed. Furthermore, the results of the homogeneity test using Levene's Test also showed a significance value greater than 0.05, meaning that the variance between the control and experimental groups was homogeneous. With both prerequisites met, parametric analysis could be used validly.

Based on the results of the Paired Sample T-Test, it is known that there is a significant difference between the pretest and posttest scores in both the control and experimental groups (Sig. 0.000 < 0.05). However, the improvement in the experimental group is much greater than that in the control group. The average difference in scores in the control class was only around 20.5 points, while in the experimental class it reached 38.2 points, or nearly twice as much. Furthermore, the N-Gain calculation results reinforce this finding. The control class achieved an average N-Gain of 0.40, categorized as moderate, while the experimental class reached an average of 0.84, categorized as high. This means that most students in the experimental class experienced a significant improvement in literacy skills after using the CEKATAN media, while the improvement in the control class was still limited.

Thus, all test results, both descriptive and inferential, indicate that the CEKATAN media in fable stories is not only valid and suitable for use but also proven to be effective in significantly improving elementary school students' literacy skills compared to conventional learning. These findings imply that the integration of crossword puzzles with fable texts provides teachers with an innovative tool to support literacy instruction. In practice, this media can be applied in reading lessons to make comprehension exercises more interactive, to encourage collaborative learning among students, and to strengthen vocabulary mastery through engaging puzzle-solving activities. For schools, CEKATAN can also be integrated into library-based literacy programs, allowing students to practice independently while still enjoying the reading process. In the broader context of elementary education, this research shows that game-based media are not merely supplementary tools but can serve as sustainable strategies for fostering reading interest, critical thinking, and character values aligned with the Pancasila Student Profile.

These results are consistent with previous research showing that crossword puzzles can enhance elementary students' learning outcomes and engagement (Darinah & Sukirno, 2023; Fauziyah et al., 2023). Zahroh et al. (2024) also confirmed the effectiveness of crossword puzzles (TTS) in both Indonesian language and mathematics lessons. In science education, crossword puzzles have been shown to strengthen students' conceptual understanding (Riyani et al., 2023). From a literature perspective, crossword puzzles contribute to improving motivation and learning achievement through game-based learning strategies (Nisa Amalia et al., 2021). International studies further support these findings; narrative-based games increase student engagement (Huynh et al., 2020), and technology-based educational crossword puzzles improve understanding, engagement, and memory (Zeinalipour et al., 2023).

These findings are in line with Fauziyah, Lestari, & Widodo (2023) who reported that crossword puzzle media enhanced students' critical thinking skills, and Darinah & Sukirno (2023) who showed that thematic crossword puzzles improved learning outcomes in elementary school. Likewise, Zahroh, Sari, & Kusuma (2024) and Riyani, Wulandari, & Putri (2023) confirmed that crossword puzzles were effective in mathematics and science learning respectively. From the literacy perspective, Yulianti (2022) and Hidayati & Sulaiman (2021) highlighted that fable-based learning materials could improve reading comprehension and increase students' reading interest, while Siagian & Sapri (2025) emphasized the role of illustrated crossword puzzles in overcoming reading difficulties. In line with these findings, Rambe & Putri (2023) demonstrated that crossword puzzle learning media significantly

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improved Indonesian vocabulary mastery in elementary students, and Dinata & Hikmah (2024) also showed a significant increase in average pretest–posttest scores, proving the effectiveness of crossword puzzles in enriching students' vocabulary. Therefore, this study reinforces that the CEKATAN media, which integrates fables and crossword puzzles, is an instructional innovation that not only enhances students' literacy skills but also supports the achievement of the Pancasila Student Profile through character development, reading interest, and vocabulary mastery.

### Conclusion

The results of this study indicated that the CEKATAN media was effective in improving students' literacy skills. The experimental class showed an average increase from 52.50% (pretest) to 90.68% (posttest), while the control class increased from 47.63% to 68.15%. Statistical analyses, including normality tests, homogeneity tests, paired sample t-tests, and N-Gain analysis, support these findings. The N-Gain value for the experimental class reached 0.84 (high category), whereas for the control class it was only 0.40 (moderate category), indicating that CEKATAN media is more effective than conventional learning methods. Based on the results, CEKATAN media is valid, practical, and effective in enhancing students' literacy skills, motivation, and active engagement. It is more effective than conventional learning methods and is recommended for use in elementary school learning.

#### Recommendation

Based on the results of this study, the CEKATAN learning media is valid, practical, and effective in improving students' literacy skills, motivation, and active engagement. The experimental class showed a significantly higher improvement in literacy compared to the control class, as evidenced by the N-Gain value of 0.84 (high category), while the control class achieved only 0.40 (moderate category). These findings indicate that CEKATAN media is more effective than conventional learning methods in elementary school settings. Therefore, integrating game-based learning strategies, such as the CEKATAN media, can be considered a valuable approach for enhancing literacy learning outcomes in lower-grade students.

Elementary school teachers are encouraged to use the CEKATAN media as an alternative learning method, especially for reading literacy instruction. Schools should support its use by providing the media in libraries and classrooms to ensure sustainable access and benefit a wider range of students. Additionally, further research in other elementary schools is recommended to validate the effectiveness of the CEKATAN media across different contexts and grade levels.

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