

Development of Letter Puzzle Learning Media to Increase Students' Beginning Ability Reading at Elementary School

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Abstract

The use of learning media is one of the tools to help educators achieve their learning objectives. This study aims to develop valid, practical, and effective letter puzzle learning media so that it is suitable for use to improve the early reading skills of class I B students at State Islamic Elementary School (MIN) Pematang Siantar. This type of research is development research or R&D (Research and Development) with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The data collection instruments used were observation, interviews, and response questionnaires to 1 teacher and 22 students from class one. Furthermore, the initial reading ability test (pretest and posttest), as well as validation sheets from media and material experts, with qualitative and quantitative descriptive techniques for validation and response data, and the n-gain test to analyze the improvement in early reading skills. The results of the media expert validation showed a score of 90.6% and material 82.6%, which indicated the feasibility of the media. The positive response results from teachers (89.2%) and students (86.2%) showed the practicality and good acceptance of the media. A significant increase in students' early reading ability is evidenced by an n-gain of 0.77 (77%) which is categorized as high or effective. This study concludes that letter puzzle learning media is effective in improving the early reading ability of first grade elementary school students.

Keywords: Beginning Ability Reading, Letter Puzzle, Learning Media

Abstrak

Penggunaan media pembelajaran menjadi salah satu alat untuk membantu pendidik dalam mencapai tujuan pembelajarannya. Penelitian ini bertujuan untuk mengembangkan media pembelajaran puzzle huruf yang valid, praktis, dan efektif sehingga layak digunakan untuk meningkatkan kemampuan membaca permulaan siswa kelas I B Madrasah Ibtidaiyah Negeri (MIN) Pematang Siantar. Jenis penelitian ini adalah penelitian pengembangan atau R&D (Research and Development) dengan model ADDIE (Analysis, Design, Development, Implementation, Evaluation). Instrumen pengumpulan data yang digunakan adalah observasi, wawancara, dan angket respon terhadap 1 guru dan 22 siswa dari kelas satu. Selanjutnya tes kemampuan membaca permulaan (pretest dan posttest), serta lembar validasi dari ahli media dan materi, dengan teknik deskriptif kualitatif dan kuantitatif untuk data validasi dan respon, serta uji n-gain untuk menganalisis peningkatan kemampuan membaca permulaan. Hasil validasi ahli media menunjukkan skor 90,6% dan materi 82,6%, yang mengindikasikan kelayakan media. Hasil respon positif dari guru (89,2%) dan siswa (86,2%) menunjukkan kepraktisan dan penerimaan yang baik terhadap media. Peningkatan signifikan dalam kemampuan membaca permulaan siswa dibuktikan dengan n-gain

sebesar 0,77 (77%) yang tergolong dalam kategori tinggi atau efektif. Penelitian ini menyimpulkan bahwa media pembelajaran puzzle huruf efektif dalam meningkatkan kemampuan membaca permulaan siswa kelas I Sekolah Dasar.

Kata Kunci: Kemampuan Membaca Permulaan, Puzzle Huruf, Media Pembelajaran

INTRODUCTION

Reading ability is one of the basic language skills that is very important, especially at the elementary school level (Manurung, 2020; Zulkifli & Royes, 2017). Reading is not only a means of obtaining information, but also a foundation for the development of other language skills such as writing and speaking (Alia Rohani & Anas, 2022). From an early age, the desire to read and write grows naturally as part of the process of understanding the environment and shaping children's cognitive abilities (Khadijah et al., 2021; Kurniawati & Koeswanti, 2020). However, in learning practices in lower grades, most students have been able to recognize letters, but still have difficulty combining the letters into a word.

In addition, many students are not yet fluent in pronouncing letters, especially in distinguishing the pronunciation of similar letters such as F, P, and V, which reveals that students tend to only pronounce letters separately without being able to arrange them into complete syllables (Simbolon & Sapri, 2022; Yana & Nasution, 2024). Early reading has a major influence on student achievement (Shabira & Andhany, 2023). One important approach, which emphasizes the introduction of the smallest elements such as letters, phonemes, and words before students are able to understand the meaning of sentences or discourse as a whole (Elsa et al., 2024; Sartika et al., 2024). Students' weak mastery of this basic stage results in difficulty understanding material in various other fields of study (Futihat et al., 2020; Simamora & Rambe, 2024).

Based on the results of initial observations conducted by the author in class I-B MIN Pematang Siantar. It was identified that most students were still confused in pronouncing capital letters, had difficulty distinguishing similar letter shapes such as I, J, and L, as well as N and U, or M and W. Not a few students were also unable to spell and read words or simple sentences. It was also emphasized from the homeroom teacher's statement that regarding reading ability, some students were not yet familiar with capital letters, and were not even able to read words well. This inequality is caused by differences in students' backgrounds in reading habits at home, as well as limited accessibility to reading and learning media that support students' reading abilities (Aida Mardiah et al., 2024; Siregar et al., 2021).

The Various previous studies have shown that learning media has a significant role in helping students improve their early reading skills. Research by (Zulkarnain & Nirwana, 2025) the media that has been proven effective in improving children's reading skills is letter puzzles, in the study (Alika & Radia, 2021) because the letter puzzle media involves fun game elements, with picture components and letter pieces arranged into one unit. In the study (Fidrayani & Purdiasih, 2022) letter puzzle media can hone students' cognitive and psychomotor abilities, train memory, concentration, and patience. The results are confirmed in the study (Susiani & Utami, 2020) letter puzzle media has proven its effectiveness in improving the reading skills of elementary school students. In line with the study (Ungau et al., 2023) letter puzzle media is also considered practical, easy to use, and able to attract students' interest in improving students' early reading skills. This study certainly has similarities in studying letter puzzle learning media, specifically to improve students' early reading skills which contribute to development to stimulate emotional interactions between teachers and students while stimulating thinking power in students in elementary schools.

This study aims to develop letter puzzle media that are specifically intended to improve early reading skills in lower grade elementary school students. Second, the form of media developed also has distinctive characteristics, namely using illustrated paper boards with special places to arrange

words, designed to be durable and can be used repeatedly. Third, the media development approach in this study integrates Piaget's constructivism theory which emphasizes the active involvement of students in building knowledge, Skinner's behaviorism which utilizes visual and kinesthetic stimuli to strengthen learning responses, and Gardner's multiple intelligences theory which accommodates variations in visual-spatial and kinesthetic intelligence.

METHOD

This research uses research and development method (Research and Development) and Development) (R&D) (Fatimah et al., 2021) . Development research is a research product to develop product the, For make product Which quality (Shabira & Andhany, 2023). On In this study, the author applied the ADDIE development model with five stages; (1) Analysis , (2) Design, (3) Development, (4) Implementation and Evaluation. Analysis (Branch & Dousay, 2015).

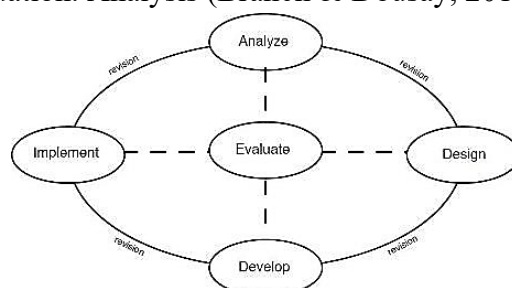


Figure 1. Steps development model ADDIE

Subject study This is student class I B MIN embankment Siantar, Jl Stone – Rock No. 1, Bah Kapul, District , Siantar Sitalasari , City embankment Siantar, Sumatra North, Which consists of from 22 students, totaling 13 students male and 9 students women. While the object of this research is the media learning puzzle letters. The data collection instruments in this study were observation, interviews, student and teacher response questionnaires, tests and validation sheets, and documentation. The data analysis technique used in this study was qualitative data collection. and quantitative. Qualitative data were obtained from validation sheets from material experts and media experts as well as response questionnaires. 22 students and 1 teacher from Class I using a Likert scale . The results of validation by material experts and media experts as well as the results of student and teacher responses will be calculated for validity. using the formula:

$$\text{Per percentage} = \frac{\text{Jumlah skor yang diperoleh}}{\text{Skor Maksimal}} \times 100\%$$

Next, the total score which was obtained was then qualitatively interpreted by interpreting the scores for assessing the validity and practicality of the media (Wismanto et et al., 2022).

Table 1. Interpretation Score Evaluation Validity and Practicality Media

Percentage (%)	Criteria Validity	Criteria Practicality
81% - 100%	Very Valid	Very Practical
61% - 80%	Valid	Practical
41% - 60%	Enough Valid	Enough Practical
21% - 40%	No Valid	No Practical
0% - 20%	Very No Valid	Very No Practical

Quantitative data collection was obtained from results Study students through pre-test And post test before And after use media, Then analyzed in a way statistics use Normalized Gain test (N-Gain score) (Artini et al., 2023) with formula;

$$N - Gain = \frac{\text{Skor Post test} - \text{Skor Pre test}}{\text{Skor Ideal} - \text{Skor Pre test}}$$

The average results obtained after searching using the *N-gain formula* are then interpreted. based on criteria level *N-gain* to know results Study student Which served

Table 2. Category Interpretation Effectiveness N-Gain S core

Percentage (%)	Interpretation
< 40	No Effective
40 – 55	Not enough Effective
55 – 75	Enough Effective
> 76	Effective

RESULT AND DISCUSSION

In this study, the development of puzzle learning media was carried out. letter with the ADDIE model. The results of the study are compiled based on the following development steps:

Analysis

The analysis stage is a process in which the author evaluates the need for media development and examines the feasibility and requirements needed in its development. The steps at this stage include direct observation in the field by observing the learning process and interacting directly with students and teachers. The teacher involved in the interview was the Indonesian language teacher and homeroom teacher I B, namely Mrs. Poni Rafiah who acted as a resource person. After observing the learning process in the classroom, it was found that students in the school had varying initial reading abilities, some could already read fluently but most could not read and even students still had difficulty distinguishing letter shapes and pronunciations, therefore media is needed that can make it easier for them to learn, especially in reading skills. In addition, students also need media that can increase learning motivation so that learning becomes more interesting. They also need media in the form of games so that they don't get bored easily. Based on these findings, it can be concluded that the main problem in this study is the lack of effective learning media to support the initial reading teaching and learning process.

Design

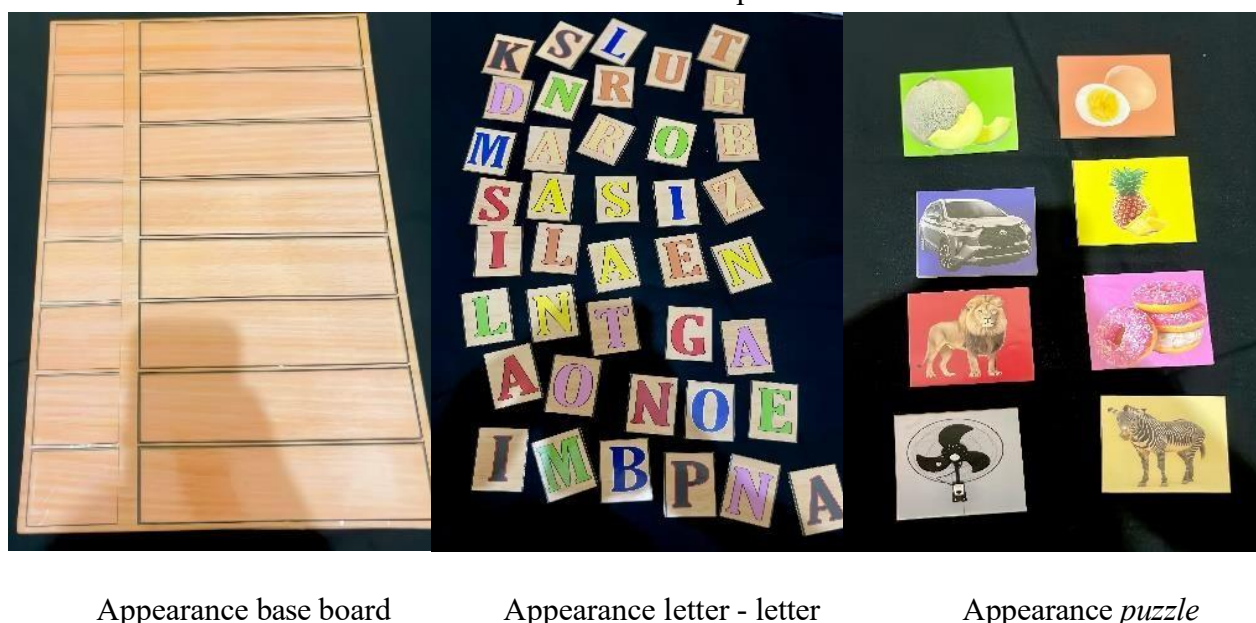
The design stage is a continuation of the analysis stage which aims to design the initial product to be developed, in this case the Letter Puzzle media as a learning aid for early reading in Elementary Schools (Maududi et al., 2018). The letter puzzle design process involves several steps. The first step is the base board, which is a paper board measuring 32 cm x 48 cm which is covered with sticker paper and consists of several blank rows to arrange the letters that will form words. The second step is the letters, which on the media consist of several pieces of vowels and consonants made of paper boards measuring 4 cm x 6 cm and covered with sticker paper with different colors. These letters are used to fill in the blank rows on the base board which will form a word. The last step is the image, which in the letter puzzle is located on the left side of the board measuring 6 cm x 6 cm which is arranged as a guide to filling in the blank rows. For example, there is a picture of a fan, then the blank rows must be filled with letters related to the picture such as "K - I - P - A - S". In addition to product design, assessment instruments were also developed. The instruments include oral performance tests to measure early reading skills, validation instruments by media and subject matter experts, and questionnaires to collect responses from teachers and students. This development aims to improve

students' early reading skills through the use of letter puzzle media.

Development

At this stage, media creation activities are carried out. The results of this stage, namely the letter puzzle learning media product, will have media feasibility results from media validator experts (Sherly Marlita Ariyani & Nurdyansyah, 2024). The creation of letter puzzle learning media is adjusted to the design stage that has been revised by the media validator.

Table 3. *Puzzle Media Components Letter*



The letter puzzle media was validated by two validators to determine the feasibility of the letter puzzle media that had been created. The feasibility of the letter puzzle media consists of the feasibility of the media and the material. This stage is to see the extent of the validity of the letter puzzle media that the author has designed with the assessment given by the material expert validator and the media expert validator.

Material validation, the material expert validator assesses the material applied in the application of the letter puzzle media that will be developed. The material expert validator is T.I. Kusumawati. The material expert validator then provides an assessment, suggestions, and comments on the material used and how to fill out the validation sheet with a checklist in the assessment score that has been provided. The results of the material expert validation produced a maximum total score of 75 with a score percentage of 100%. Based on the results of the validation data by the material expert, the score obtained was 62, with a percentage of 82.6%. This places the classification in the "very valid" category with an interval of 81% - 100%. Thus, the letter puzzle media is suitable for use according to the material that makes it easier for students to solve problems in reading activities.

Media expert validation, The media expert validator assessed the design of the letter puzzle media that had been prepared and would be developed at MIN Pematang Siantar, precisely in class I. The media expert validator was A.H Rambe. The media expert validation data was obtained by showing the letter puzzle media, along with the assessment instrument. The media expert validator then provided an assessment, suggestions, and comments on the letter puzzle media and how to fill in the validation sheet with a checklist in the assessment score that had been provided. The results of the media expert validation produced a maximum total score of 75 with a score percentage of 100%. Based on the results of the validation data by the media expert, the score obtained was 68, with a percentage of 90.6%. This places the classification in the "very valid" category with an interval of 81% - 100%. The media expert validator provided suggestions and comments which must then be

improved according to the suggestions and comments from the media expert validator. Thus, the letter puzzle media is suitable for use according to the material that makes it easier for students to solve problems in reading activities.

Implementation

At this stage, the author applies the letter puzzle learning media that has been developed and revised in Indonesian language learning. This media was implemented in class I B MIN Pematang Siantar consisting of 22 students. The letter puzzle learning media showed the effectiveness of the average pretest score of students getting a score of 63.18 which indicated less effective understanding of the material. However, after learning using letter puzzles, the average posttest increased to 91.14 indicating a significant increase in early reading ability towards understanding the material and was included in the very effective category. To measure the increase in students' early reading ability towards the use of letter puzzle media, the author conducted a pretest and posttest. The results of these two tests were then analyzed using the n-gain calculation, which aims to measure the increase in students' early reading ability. Before learning with letter puzzles began, a pretest was given to get an initial picture of early reading ability.

Table 4. Results *N-gain*, *Pretest* And *Posttest* In general Overall

<u>Mark Average</u>		<i>N-gain Score</i>	N-gain Score (%)	Interpretation
<i>Pre- test</i>	<i>Post-test</i>			
63.18	91.14	0,77	77%	High/Effective

Based on the table, the calculation using the N-gain score formula produces an increase of 0.77 with a percentage of 77%. This means that there is an increase with a high category. From the data results, it can be concluded that the use of letter puzzle media is effective in improving the early reading skills of class I B students at MIN Pematang Siantar. After the learning session was carried out using letter puzzle media, the next step was to fill out a student response questionnaire for 22 class I B students, and fill out a teacher response questionnaire for learning Indonesian language for early reading material using the sound method with letter puzzle media. The results of this questionnaire aim to evaluate the practicality of the letter puzzle media that has been used. In terms of data analysis regarding the practicality of using the media, the letter puzzle media obtained a score of 89.3% from teachers which is classified as very practical. And student responses in using letter puzzle media obtained a score of 86.2% which is also included in the very practical category. Based on the results of the students' responses, it can be said that the letter puzzle media is very practical for improving students' early reading skills at MIN Pematang Siantar, especially at the first grade level.

The discussion of this study shows that the development of letter puzzle media has proven effective in improving the early reading skills of first grade students at MIN Pematang Siantar. At the analysis stage, initial findings showed that students had difficulty in recognizing letters and pronouncing them, which is a basic problem in the early literacy process (Maesaroh et al., 2022). This condition is in line with the study (Oktadiana, 2019) which emphasizes the importance of visual aids and social interaction in building children's language skills at an early stage of development. Therefore, interesting and interactive learning media are needed to bridge this gap (Maghfiroh et al., 2019).

The letter puzzle media is designed with a phonetic approach through the bottom-up method, where students are first introduced to letters and their sounds before forming words (Ehri, 2022). The design of this media also refers to Piaget's constructivism theory, which emphasizes that children learn actively through the manipulation of concrete objects (Marinda, 2020), as well as Skinner's behaviorist theory which highlights the importance of reinforcement in forming new learning behaviors (Rozi & Arifin, 2024). The combination of a base board, colored letter pieces, and visual

cue images not only strengthens sound-letter associations but also accommodates visual and kinesthetic intelligence as explained in Howard Gardner's Multiple Intelligences theory (Cavas & Cavas, 2020). In terms of validity, the validation results of material experts (82.6%) and media experts (90.6%) show that this media meets the eligibility criteria in terms of content and visual appearance. This is in line with the findings (Agprianti et al., 2022; Panca Agustina et al., 2024) which emphasize that game-based media with a visual and kinesthetic approach can increase students' enthusiasm and involvement in the reading learning process. The implementation stage provides empirical evidence of the effectiveness of this media, where there was an increase in the average score from 63.18 (pretest) to 91.14 (posttest) with an N-gain value of 0.77 or 77%, included in the high increase category. These results are in line with research (Fidrayani & Purdiasih, 2022) which states that media based on visual and kinesthetic stimuli have a positive influence on children's basic literacy skill.

Evaluation

The final evaluation showed that teachers and students gave a very positive response to this media, data regarding the practicality of using letter puzzle media obtained a score of 89.3% from teachers who were classified as very practical. And student responses in using letter puzzle media obtained a score of 86.2% also included in the very practical category.

First, this finding confirms that letter puzzle media is not only pedagogically effective, but also provides practical and fun reinforcement for use in the classroom, teachers easily use letter puzzle media by providing an understanding of recognizing letters, sounding letters and remembering letters (Alika & Radia, 2021). This also strengthens the importance of integrating affective and psychomotor aspects in reading learning, as emphasized in early literacy studies based on a holistic approach (Meriyandah et al., 2025).

Second, letter puzzle media makes it easy for teachers to replicate, because it uses simple materials, not only that, letter puzzle media also has an attractive and durable design. Teachers and schools can use this media at lower grade levels without requiring complex technical training. This makes it a cost-effective and practical solution in strengthening basic literacy, especially in areas with limited resources (Yoosefi Lebni et al., 2023). These findings indicate that the use of letter puzzle media does not require special technical training that is expensive, but rather emphasizes the creativity of teachers in utilizing local materials independently. This media is a practical and economical solution that allows teachers in areas with limited resources to continue to present interesting and effective learning. With a simple yet functional design, letter puzzles strengthen basic literacy without relying on expensive technology or external interventions, while emphasizing the strategic role of teachers as learning innovators in the classroom. Third, the success of letter puzzle media in significantly increasing student learning scores provides emotional interactions built between teachers and students, (Khorammakan et al., 2023). The implementation of letter puzzle media in learning has proven to be one form of effective innovation in reaching multiple intelligences. Letter puzzle learning media not only hones linguistic intelligence through word recognition and arrangement, but also stimulates visual-spatial intelligence through pattern and shape recognition activities, as well as kinesthetic intelligence through physical manipulation of letter pieces. In a dynamic classroom atmosphere, this activity also encourages collaborative interaction, thereby strengthening students' interpersonal intelligence.

The success of letter puzzle media in significantly increasing students' learning scores is not solely determined by its mechanical aspects, but by the success of teachers in building positive emotional interactions during the learning process. When teachers are able to be present as empathetic facilitators, able to read students' affective needs, and create a fun and supportive learning space, learning becomes more meaningful.

Letter puzzle learning media has significant practical implications, especially in the context of early literacy learning in Elementary Schools. First, the letter puzzle media that was developed has proven to be an effective and fun learning alternative, so that teachers can integrate it into the teaching

and learning process to overcome early reading difficulties without having to rely on conventional lecture methods (Darmayanti, 2023). This media facilitates interactive and collaborative learning activities, thus helping students to be actively involved in recognizing letters, sounds, and word formation.

Finally, the results of positive responses from teachers and students show that a fun and game-based learning approach can build higher learning motivation. Therefore, schools and elementary education policy makers are advised to encourage the wider use of interactive media such as letter puzzles as part of a strategy to improve the quality of national literacy (Bellasonya & Dahlan, 2024).

CONCLUSION

The use of letter puzzle learning media is proven by an increase in the pretest score of 63.18 and a posttest score of 91.14 with an n-gain score of 0.77 or 77% included in the effective category. These results confirm that letter puzzle media can significantly improve the early reading skills of grade I Elementary School students, with an emphasis on improving students' affective and psychomotor aspects. In addition, this media is also able to build emotional interactions that stimulate visual-spatial intelligence through a creative and fun learning approach. However, the limitation of this media lies in the lack of integration with digital technology. In the era of information technology-based learning, letter puzzle media is still manual and does not support digital interactive features that can improve personalization and remote access. The shortcomings also include limited visual and sound innovations that can support the multisensory of 21st century students. Therefore, further development is recommended towards the digitalization of this media to be in line with the demands of modern education that is technology-based and inclusive of diverse learning styles.

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