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Improving Beginning Reading Ability Through Syllable Puzzle Media Among Grade I Students at Elemantery School

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ABSTRACT

This study aims to investigate the effect of syllable puzzle media on beginning reading ability among Grade I students at SD Muhammadiyah 2, Sorong City. A quantitative approach with a pre-experimental one-group pretest-posttest design was employed. The population and sample consisted of all 26 Grade I students. Data were collected through observation, oral reading tests, and documentation. Content validity was established through expert judgment by a university literacy lecturer. Prior to hypothesis testing, a normality test (Kolmogorov-Smirnov) was conducted; as both pretest and posttest data were non-normally distributed ($p = 0.000 < \alpha = 0.05$), the non-parametric Wilcoxon Signed Ranks Test was applied. The pretest mean score was 11.69, and the posttest mean score increased substantially to 17.34. The frequency distribution revealed that before the intervention, 50% of students were categorized as 'sufficient' (score range 6–10); following the intervention, 80.77% of students achieved the 'very good' category (score range 16–20). The Wilcoxon test yielded a significance value of 0.000 ($< \alpha = 0.05$), confirming

acceptance of the alternative hypothesis (Ha) and rejection of the null hypothesis (H0). These findings demonstrate that syllable puzzle media exerts a significant positive effect on beginning reading ability among Grade I elementary school students, improving letter recognition, syllable blending, fluency, pronunciation accuracy, and intonation.

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INTRODUCTION

Education constitutes one of the most critical pillars of human resource development. Through education, individuals acquire the knowledge, skills, values, and attitudes necessary to navigate the challenges of contemporary life. Education serves not only as a conduit for knowledge transfer but also as a formative process for character development and the optimization of students' potential. Consequently, the responsibility for improving educational quality rests jointly with government, schools, teachers, parents, and the broader community.

Within the elementary school educational process, language proficiency occupies a central role, as it underpins students' ability to comprehend content across all subject areas. Among the language skills that must be developed from an early age, reading ability is paramount. Reading involves the recognition of written language symbols to extract information, build knowledge, and construct meaning from text. Tarigan (2014) defined reading as a cognitive process whereby readers decode messages conveyed by authors through written language.

Reading ability constitutes the foundational competency for academic success. Students with strong reading skills are better equipped to comprehend instructional content, complete academic tasks, and develop knowledge

independently. Conversely, students experiencing reading difficulties tend to encounter compounding barriers to learning, which adversely affect their overall academic achievement (Ziegler & Goswami, 2016; Kodan & Akyol, 2018).

At the elementary school level—particularly in Grade I—students are at the stage of beginning reading (membaca permulaan). Beginning reading constitutes the foundational competency that students must develop before progressing to advanced reading. At this stage, students learn to recognize letters, syllables, words, and simple sentences. Rahim (2012) defined beginning reading as the process of recognizing phonetic symbols with the objective of enabling students to read accurately, fluently, and with comprehension of simple texts.

Sound beginning reading ability is strongly predictive of students' subsequent academic achievement. However, a considerable number of elementary school students continue to experience reading difficulties. These difficulties may arise from multiple factors, both internal and external. Internal factors include learning motivation, reading interest, learning readiness, and cognitive ability, while external factors include the home environment, parental support, instructional methods, and the availability of diverse learning media (Goodrich & Namkung, 2019; Nurhasanah & Sobandi, 2016).

Based on preliminary observations and interviews with the Grade I teacher at SD Muhammadiyah 2, Sorong City, it was identified that a number of students experienced difficulties in beginning reading. These difficulties were evident when students were asked to read syllables or simple words: many students still spelled out individual letters, read haltingly, and were unable to accurately blend letters into syllables and words. Furthermore, reading instruction was predominantly conducted using conventional, teacher-centered methods, resulting in reduced student engagement and boredom during learning activities.

One approach to improving beginning reading ability is the use of

engaging, interactive, and developmentally appropriate instructional media. Instructional media serve as facilitative tools that make content delivery more effective and enjoyable. Arsyad (2016) emphasized that instructional media can enhance students' attention, motivation, and engagement in the learning process. Mayer's (2020) Cognitive Theory of Multimedia Learning further provides theoretical support for the use of visual-tactile media in early reading instruction, as the dual-channel processing of visual and kinesthetic inputs enhances encoding and retention of phonological information.

Syllable Puzzle Media (Media Puzzle Suku Kata) represents an innovative instructional tool designed to improve beginning reading ability. Syllable puzzles consist of card pieces containing letters or syllables that students assemble to form words. Through play-based learning using syllable puzzles, students recognize letters, understand syllable relationships, and progressively develop their reading skills. Several prior studies have demonstrated the effectiveness of puzzle-based media in elementary reading instruction. Dorus Padua (2022) found that letter puzzle media effectively improved reading ability among Grade I elementary students, while Brawijaya (2023) reported that word puzzle media positively influenced students' reading literacy outcomes.

Based on the foregoing background, this study was conducted under the title 'The Effect of Syllable Puzzle Media on Beginning Reading Ability Among Grade I Students at SD Muhammadiyah 2, Sorong City'. This study aims to contribute empirical evidence regarding the effectiveness of syllable puzzle media as an innovative instructional tool for improving beginning reading ability in the elementary school context.

METHODS

Research Desaign

This study employed a quantitative approach with a pre-experimental

one-group pretest-posttest design. Experimental research, as explained by Sugiyono (2012), is a research method designed to identify causal relationships between variables under controlled conditions. A pre-experimental design was selected given the absence of a control group; the same group of students served as both the experimental and comparison unit, with pre-treatment (pretest) and post-treatment (posttest) measurements obtained from the same sample. The research design is presented in Table 1 .

Table 1. One-Group Pretest-Posttest Research Design

Pretest	Treatment	Posttest
O1	*X*	*O2*

Note: O1 = Pretest; X = Treatment (Syllable Puzzle Media); O2 = Posttest. Source: Sugiyono (2012)

Research Site, Timeline, and Participants

The study was conducted at Grade I, SD Muhammadiyah 2, Sorong City, located on Jalan Basuku Rahmat Km. 10, Sorong City. Data collection was carried out from January 12 to 19, 2026. The population and sample comprised all 26 Grade I students, selected using total sampling, as the accessible population was limited in size and all members met the research criteria. This study involved two variables: the independent variable (syllable puzzle media) and the dependent variable (beginning reading ability).

Data Collection Instruments

Three data collection instruments were utilized. First, structured observation using a standardized observation sheet was employed to monitor student learning behaviors and reading engagement throughout the instructional sessions. Second, an oral reading test was administered as both pretest and posttest. The oral test assessed five dimensions of beginning reading ability: accuracy, pronunciation, intonation, reading fluency, and voice clarity. Each dimension was evaluated using a performance assessment rubric. Third, documentation was collected to provide contextual evidence of the instructional process and student activities.

Content validity of the oral reading test instrument was established through expert judgment conducted by Mrs. Desti, M.Pd., a university literacy lecturer at UNIMUDA Sorong. The validation process yielded a score of 12 out of a maximum of 20, equivalent to 60% of the maximum score. This score confirmed that the instrument was valid and appropriate for use in the study.

Data Analysis

Normality Test

Prior to hypothesis testing, a normality test was conducted using the Kolmogorov-Smirnov method to determine whether the data were normally distributed. The decision criterion was: data are normally distributed if the significance value exceeds α = 0.05; data are non-normally distributed if the significance value is less than α = 0.05 (Sugiyono, 2016).**Hypothesis Testing**

As the normality test revealed that both pretest and posttest data were non-normally distributed, the non-parametric Wilcoxon Signed Ranks Test was employed for hypothesis testing, processed using SPSS for Windows Version 21. The hypotheses were formulated as follows: H0 posited that there is no significant effect of syllable puzzle media on beginning reading ability (sig. > 0.05); Ha posited that there is a significant positive effect of syllable puzzle media on beginning reading ability (sig. < 0.05).

RESULTS AND DISCUSSION

Prerequisite Analysis

Validity Test

Content validity of the reading ability test instrument was established through expert judgment. The reading test was designed to assess students' beginning reading performance across five key dimensions: accuracy, pronunciation (lafal), intonation, reading fluency, and voice clarity. Following expert review by Mrs. Desti, M.Pd., the instrument was validated with a score of 12/20 (60%), confirming its suitability for measuring beginning reading ability in the Grade I context. The instrument was subsequently approved for use in the study.

Normality Test

The normality test results are presented in Table 2.

Table 2. Normality Test Results (Tests of Normality)

	Group	Kolmogorov-Smirnov (Statistic)	Kolmogorov-Smirnov (df)	Kolmogorov-Smirnov (Sig.)	Shapiro-Wilk (Statistic)	Shapiro-Wilk (df)	Shapiro-Wilk (Sig.)
Beginning Reading Ability	Pretest	.269	26	.000	.621	26	.000
	Posttest	.350	26	.000	.736	26	.000

Source: SPSS V21.0 Statistics for Windows; a. Lilliefors Significance Correction

As shown in Table 2, both the pretest data (Kolmogorov-Smirnov sig. = 0.000; Shapiro-Wilk sig. = 0.000) and posttest data (Kolmogorov-Smirnov sig. = 0.000; Shapiro-Wilk sig. = 0.000) yielded significance values below α = 0.05. Consequently, both datasets were classified as non-normally distributed. In accordance with this finding, hypothesis testing was conducted using the non-parametric Wilcoxon Signed Ranks Test rather than a parametric t-test.

Descriptive Analysis of Pretest and Posttest Data

Pretest Data (Before Syllable Puzzle Media Intervention)

Data collection commenced from January 12, 2026, with the administration of the pretest to assess students' beginning reading ability prior to the intervention. The pretest assessed students' reading performance across the five dimensions of beginning reading ability. The statistical summary revealed a pretest mean of 11.69 (sum = 304), with a median of 11.69 and a mode of 10. Table 3 presents the frequency distribution of pretest scores by performance category.

Table 3. Frequency Distribution of Pretest Scores — Beginning Reading Ability (Before Syllable Puzzle Media)

No.	Category	Score Range	Number of Students	Percentage (%)

No.	Category	Score Range	Number of Students	Percentage (%)
1	Very Good	16–20	8	30.77
2	Good	11–15	5	19.23
3	Sufficient	6–10	13	50.00
4	Poor	0–5	0	0.00
	Total		**26**	**100**

Source: Primary data processed using SPSS V21.0, 2026

As presented in Table 3, the majority of students (50%; n = 13) were categorized as 'Sufficient' (score range 6–10) in the pretest, indicating limited beginning reading proficiency prior to the intervention. Only 30.77% (n = 8) achieved the 'Very Good' category, while 19.23% (n = 5) were categorized as 'Good'. No students fell in the 'Poor' category. These results confirm that beginning reading ability was generally low to moderate before the syllable puzzle media intervention.

Posttest Data (After Syllable Puzzle Media Intervention)

Following the two-session syllable puzzle media intervention, the posttest was administered to assess changes in students' beginning reading ability. The posttest statistical summary revealed a substantially higher mean of 17.34 (sum = 451), with a median of 17.36. Table 4 presents the posttest frequency distribution.

Table 4. Frequency Distribution of Posttest Scores — Beginning Reading Ability (After Syllable Puzzle Media)

No.	Category	Score Range	Number of Students	Percentage (%)
1	Very Good	16–20	21	80.77
2	Good	11–15	5	19.23
3	Sufficient	6–10	0	0.00
4	Poor	0–5	0	0.00

No.	Category	Score Range	Number of Students	Percentage (%)
Total			**26**	**100**

Source: Primary data processed using SPSS V21.0, 2026

Table 4 demonstrates a striking improvement in students' beginning reading ability following the intervention. A substantial majority of students (80.77%; n = 21) achieved the 'Very Good' category in the posttest, compared to 30.77% in the pretest. The remaining 19.23% (n = 5) were categorized as 'Good'. Critically, no students remained in the 'Sufficient' or 'Poor' categories following the intervention. This shift represents a marked and practically significant improvement in beginning reading performance across the entire sample.

Hypothesis Testing: Wilcoxon Signed Ranks Test

Following confirmation that all prerequisite analyses were fulfilled, hypothesis testing was conducted using the Wilcoxon Signed Ranks Test. Table 5 presents the complete results.

Table 5. Wilcoxon Signed Ranks Test Results — Effect of Syllable Puzzle Media on Beginning Reading Ability

Pair	N	Mean Rank	Sum of Ranks
Posttest − Pretest Negative Ranks	0[a]	.00	.00
Posttest − Pretest Positive Ranks	25[b]	10.00	10.00
Posttest − Pretest Ties	1[c]		
Posttest − Pretest Total	26		

Test Statistics: Z = −3.837[a]; Asymp. Sig. (2-tailed) = .000

[a] Based on negative ranks. [b] Posttest > Pretest. [c] Posttest = Pretest.
Source: SPSS V21.0 Statistics for Windows, 2026

As shown in Table 5, of the 26 student participants, 25 demonstrated positive rank differences (posttest scores exceeding pretest scores), 0 demonstrated negative rank differences, and 1 demonstrated a tie (identical

pretest and posttest scores). The Wilcoxon Signed Ranks Test yielded a Z-value of −3.837 and an Asymp. Sig. (2-tailed) of 0.000, which is significantly below the significance threshold of α = 0.05. Accordingly, the alternative hypothesis (Ha) is accepted and the null hypothesis (H0) is rejected, confirming that the use of syllable puzzle media exerts a statistically significant positive effect on beginning reading ability among Grade I students at SD Muhammadiyah 2, Sorong City.

Discussion

The findings of this study demonstrate a substantial and statistically significant improvement in students' beginning reading ability following the implementation of syllable puzzle media, with pretest and posttest mean scores of 11.69 and 17.34, respectively. The Wilcoxon test result (sig. = 0.000 < α = 0.05) confirms the presence of a significant intervention effect. These findings are consistent with and extend prior research on puzzle-based instructional media in elementary reading contexts.

The effectiveness of syllable puzzle media in improving beginning reading ability can be explained from multiple theoretical perspectives. First, from a constructivist standpoint (Vygotsky, 2016), the active assembly of puzzle pieces enables students to construct their own understanding of letter-syllable and syllable-word relationships, making the learning process inherently meaningful. Students at the concrete operational stage of cognitive development—characteristic of Grade I learners—benefit particularly from hands-on, manipulative learning experiences that provide tactile and visual feedback (Rahim, 2012).

Second, Mayer's (2020) Cognitive Theory of Multimedia Learning provides a theoretical basis for the effectiveness of syllable puzzle media. The integration of visual (letter shapes on puzzle pieces) and kinesthetic (physical manipulation of pieces) processing channels creates dual-encoding of phonological information, which enhances retention and retrieval of letter-

sound associations. This dual-channel processing is particularly beneficial for early readers who are in the process of establishing the orthographic-phonological connections that underpin fluent reading (Ziegler & Goswami, 2016).

Third, the motivational benefits of syllable puzzle media contributed substantially to the observed learning gains. The game-like quality of puzzle activities increased students' engagement, enthusiasm, and willingness to participate in reading tasks—qualities that were markedly different from the passive reception characteristic of conventional, teacher-centered instruction. Retnowati et al. (2022) similarly demonstrated that puzzle media positively influenced both motivation and beginning reading outcomes among Grade I students. Widyastuti and Susanah (2020) further confirmed that puzzle media use in beginning reading instruction significantly improved students' phonological awareness and reading fluency.

Fourth, the syllable puzzle intervention aligns with the principles of Indonesia's Merdeka Belajar (Emancipatory Learning) curriculum, which emphasizes student-centered, collaborative, and discovery-based learning. The puzzle activity created a learning environment in which students were afforded agency, collaborative problem-solving opportunities, and the experience of cognitive discovery, all of which supported autonomous and intrinsically motivated reading skill development (Dafit & Ramadan, 2020).

The consistency of findings across the entire sample, with 25 of 26 students demonstrating measurable improvement and no students showing regression, underscores the robustness of syllable puzzle media as an instructional intervention. The one student who showed no change (tie) may warrant targeted one-on-one reading support to address specific barriers to reading progress that group-based puzzle instruction alone cannot fully address. Kodan and Akyol (2018) and Shu-Chen (2019) emphasized the importance of individualized reading support for students who do not respond to whole-class interventions, suggesting the value of differentiated follow-up

for this learner.

CONCLUSION

Based on the research findings and discussion, the following conclusions are drawn regarding the effect of syllable puzzle media on beginning reading ability among Grade I students at SD Muhammadiyah 2, Sorong City. The use of syllable puzzle media exerts a statistically significant and practically meaningful positive effect on beginning reading ability. The pretest mean score of 11.69 increased substantially to a posttest mean score of 17.34 following two sessions of syllable puzzle media instruction. The frequency distribution analysis revealed that the proportion of students achieving the 'Very Good' category increased from 30.77% (pre-intervention) to 80.77% (post-intervention), while the 'Sufficient' category decreased from 50% to 0%.

The Wilcoxon Signed Ranks Test yielded an Asymp. Sig. (2-tailed) value of 0.000 ($< \alpha = 0.05$), confirming acceptance of Ha and rejection of H0. Syllable puzzle media effectively facilitated improvement in all five assessed dimensions of beginning reading ability: letter recognition, syllable blending, reading fluency, pronunciation accuracy, and intonation. Furthermore, the intervention positively influenced students' learning motivation, active participation, and overall enthusiasm for reading activities.

Syllable puzzle media is therefore strongly recommended as an effective and developmentally appropriate instructional tool for beginning reading in the lower grades of elementary school, particularly in educational contexts characterized by limited instructional media resources and student disengagement with conventional reading instruction methods. Future research should examine the long-term retention effects of puzzle-based reading interventions, explore the comparative effectiveness of syllable puzzle media versus other game-based literacy tools, and investigate the applicability of this approach across diverse regional and linguistic contexts within Indonesia.

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Declarations

Author Contribution	: Aligonda Baru: Conceptualization, Data Collection, Writing – Original Draft, Formal Analysis; Anis Alfian Fitriani: Writing – Review & Editing, Methodology; Selfiani: Supervision and Validation.
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