

Research Article

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Design And Development of Mobile Text Levelling Media (MTLM) Based on Local Wisdom of Semarang City to Improve Basic Literacy

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Abstract

Background/purpose. This study investigates the persistent problem of low basic literacy skills among first-grade elementary school students and their limited awareness of their immediate environment. Observations and interviews indicate that these challenges stem from the absence of learning media that effectively support hybrid learning, particularly media suitable for early readers. To address these needs, this study develops an Android-based Mobile Text Levelling Media (MTLM) that provides levelled texts and integrates elements of Semarang's local culture. The purpose of this research is to design, validate, and examine the feasibility of MTLM as an accessible and practical literacy tool for young learners using the Borg & Gall development model and expert validation procedures.

Practical Implications. The findings show that MTLM is valid and feasible for classroom use, highlighting its potential to support teachers in addressing early literacy challenges. Because MTLM provides levelled texts, simple navigation, and culturally relevant content, it can enhance students' engagement and reading comprehension. In the context of hybrid learning, where students frequently transition between school and home environments, the accessibility of MTLM via Android devices makes it especially beneficial. Schools and teachers can adopt MTLM as a complementary tool to enrich literacy instruction, while parents can use it to support reading practices at home. This suggests that technology-enhanced, culturally grounded literacy media can be strategically incorporated into early-grade lesson planning.

Conclusion. The study concludes that MTLM has strong potential to improve basic literacy skills among first-grade students when integrated effectively into the learning process. Although the media is not a standalone solution, its success depends on how well teachers embed it within broader literacy instruction. When appropriately implemented, MTLM can make early literacy learning more engaging, contextually meaningful, and accessible for young learners. The integration of local cultural elements also adds value by strengthening students' connection to their environment while supporting their emerging reading skills.

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1. Introduction

The Ministry of Education and Culture, through Ministerial Regulation number 23 of 2013, launched a school literacy movement to foster interest in reading and noble character attitudes in children through language (Putri et al., 2024; Carruana Martín et al., 2023; Cahyaningsih, 2020). Basic literacy is the ability to listen, speak (Mousena, 2020; Fitria, 2023; Grefa et al., 2025a), read, write (Ali, 2022), and count (Fitria, 2023) related to analytical skills (Cladis, 2020); (Grefa et al., 2025b) to calculate, perceive information, communicate (Rahman et al., 2019), and describe information based on personal understanding and conclusions (Dolmans et al., 2002). Researchers develop information literacy based on opinions that include early literacy, basic literacy, library literacy, media literacy, technology literacy, and visual literacy (Dolmans et al., 2002). In the 2013 curriculum, Indonesian language learning in elementary schools is text-based learning. Based on the PISA (Program for International Student Assessment) (Inderawati et al., 2022; Selvina et al., 2018), the average Indonesian literacy score is 379, which is 52 points below the average for students in Southeast Asia. Based on the percentage, only 24% of students have a minimum or higher level of competence. More than 70% of Indonesian students are below the minimum competency level in reading (Patria, 2021; Nugrahanto & Zuchdi, 2019) and mathematics (Susanto et al., 2023). This fact was also found in Semarang City. Nationally, the illiteracy rate in 2018 (Nurlaela, 2020) was 1.93%, with 3,290,490 people illiterate.

Basic literacy learning for first-grade elementary school students continues to face various challenges. Observations and communication with teachers indicate that many students are not yet ready to read, have difficulty recognising letters, understanding simple words, and lack motivation to read because the media used is uninteresting and not developmentally appropriate. Furthermore, digital technology in learning has not been fully utilised, even though students are familiar with devices. This situation highlights the need for learning media that can support the early literacy process in a gradual, interactive, and easily accessible manner, both at school and at home (Svensson et al., 2021; Ng et al., 2022; Lestari & Rasilah, 2025).

Wrong One: strategy education is recommended to read more books that are scientifically appropriate to the text, which can increase children's interest in exploring science and reading more (Aukerman & Chambers Schuldt, 2021; Vuong et al., 2021; Kim et al., 2021). Hybrid learning was implemented as part of the education policy following the pandemic and lasted approximately two years (Haningsih & Rohmi, 2022). The implementation of hybrid learning closes the gap with technology. Teachers need pedagogical skills and content that effectively utilise technology to improve students' skills, including computing skills.

Previous studies have shown that digital media can help improve early reading skills, especially if they include simple text, engaging visuals, and interactivity that allows children to learn independently (Izhar et al., 2022; Lubis et al., 2023; Winarni et al., 2020). Various studies have also found that media based on local culture can improve students' understanding of context and emotional connection to reading material (Tuhuteru et al., 2023; Wuyckens et al., 2022). However, previous research has been limited to print media, image-based modules, or applications that do not provide levelled text appropriate for early school-age students' abilities. Furthermore, there is limited research integrating basic literacy with child-friendly digital media for use in hybrid learning contexts.

The research gap arises from the need for digital literacy media that are not only engaging and interactive but also provide levelled texts that enable teachers to systematically facilitate reading development. On the other hand, schools require media that is easy to use and can help parents support their children at home. Therefore, this study was conducted to develop and test the effectiveness of the Mobile Text Levelling Media (MTLM) as a solution for improving students' basic literacy skills.

The objectives of this study were: (1) to develop MTLM that meets the learning needs of first-grade students, (2) to test the media's feasibility based on expert and user assessments, and (3) to analyse the media's effectiveness in improving students' basic literacy. Based on these objectives, the research questions posed were: (1) How is the MTLM development process for first-grade students? (2) What is the feasibility of MTLM based on expert, teacher, and student assessments? (3) To what extent is MTLM effective in improving students' basic literacy skills?

2. Literature Review

2.1. Mobile Text Levelling Media (MTLM)

A good text for students is one that both motivates and challenges them (Kruk & Kałużna, 2025). A motivating text is easy for students to understand, thus developing their self-confidence. On the other hand, a challenging text is difficult for students to understand and requires a variety of reading activities to comprehend. Literacy learning, particularly basic reading, must be supported by the availability of appropriate teaching materials, namely texts suited to students' characteristics. Therefore, teachers must be able to select and sort texts that are suitable for use as open-ended materials for students. Efforts to sort and select texts should be carried out in line with the reality that each text has different characteristics depending on the level of its intended use (Şimşek et al., 2025). Efforts to select texts that suit students' characteristics can be done by considering several criteria for selecting texts as open-ended materials. One criterion for selecting texts as open-ended materials is the suitability of the text's difficulty level to the students' abilities. Material appropriate to the level of text comprehension and the reader's understanding can not only increase reading interest but also positively influence literacy skills (Taye & Teshome, 2025).

Mobile Text Levelling Media (MTLM) is a development of levelled textbook learning media in the form of an Android application that can be installed on smartphones to support hybrid learning in second-grade elementary schools. Levelled textbooks generally teach beginning reading, writing, and reading comprehension through regular books. However, MTLM is used to teach basic literacy skills on an Android platform based on local-wisdom content. Material developed in the student's environment will make it easier for them to understand the context of the reading (Nash, 2025). There are four criteria to consider when selecting appropriate open-text materials for children. These four criteria are: 1) the level of familiarity/familiarity of the content with the child's background and knowledge, 2) the level of the subject language, 3) the level of textual support, and 4) the level of cultural appropriateness (Bélanger et al., 2025). Thus, converting levelled textbooks into learning media applications is a form of learning innovation that can support the current learning process.

The main elements of Mobile Text Levelling Media are images, text, and sound. The absence of images in learning media can make it easier for students to understand the lesson (Arfi et al., 2024). In addition to emphasising visual elements, mobile text-levelling media also include text arranged in stages, from simple to complex, to support students' literacy development. At level 1, students read texts with an understanding of several repeated single-sound consonant clusters and diphthongs, and use prepositional phrases. At level 2, students read text with an understanding of 4 to 6 words per line and 4 to 6 lines per page. At level 3, texts contain several repetitions of single-sound consonant clusters and diphthongs, and many easy-to-read words. At level 4, students read text with an understanding of 6 to 10 words per line and 6 to 8 lines per page. The activities in mobile text-levelling media encourage students to learn actively and independently. This aligns with Dale's pyramid of learning experiences, which states that children's engagement constitutes 70% of their learning experience (da Silva, 2025).

Several relevant studies have been conducted on the development of mobile text levelling media. The absence of images in learning media supports the improvement of students' literacy skills (Zhang et al., 2025). In addition, Kusuma et al. (2025) stated that the use of Android-based learning

media can improve students' understanding of the subject. In addition to improving learning outcomes, mobile learning-based learning media also support the hybrid learning process (Han, 2025).

2.2. Local Wisdom

Local wisdom is the knowledge within the traditional culture of a particular ethnic group. Each ethnic group possesses local wisdom values, whether they arise from local traditional culture, result from adopting foreign cultures, or result from adapting foreign cultures to local traditions (Wijayanti, 2025). Local wisdom (or local genius) is local thought or ideas that contain wise, creative, and good values, which are internalised from generation to generation (traditional) (Wirata, 2025). Local wisdom can be defined as thoughts about life that are based on clear reasoning, good character, and contain positive elements. It can be translated as the work of reason, deep feelings, character, behavioural patterns, and recommendations for human dignity (Ouladhadda, 2025). Albantani & Madkur state that there are five characteristics of local wisdom. The five characteristics are: (1) being able to withstand foreign culture, (2) having the ability to accommodate elements of foreign culture, (3) having the ability to integrate elements of foreign culture into native culture, (4) having the ability to control foreign culture, and (5) being able to provide direction for cultural development (Ligia et al., 2024). Learning media based on local wisdom is easier for students to understand because it is more contextual. Thus, the selection and development of learning media for students is recommended to include elements of the surrounding environment (Fitrianto & Farisi, 2025).

2.3. Basic Literacy Skills

Basic Literacy aims to optimise the ability to listen, speak, read, write, and calculate. In basic literacy, the ability to listen, speak, read, write, and calculate relates to analytical skills for calculating, perceiving information, communicating, and drawing conclusions based on personal understanding. Of the various types of literacy mentioned previously, one important type is reading literacy. Reading literacy is the initial type of literacy whose meaning has changed over time (Kalantzis & Cope, 2025). Reading literacy is important and related to education. Essentially, literacy is the ability to read and write. "Reading literacy can be a means for students to recognise, understand, and apply the knowledge gained in school (Xu et al., 2024).

In this study, basic literacy is limited to reading literacy specifically for first-grade elementary school students. The reading skill taught in first-grade elementary school is beginning reading. Nine indicators can be used as a basis for developing an initial reading instrument, including: 1) reading without pointing, 2) finding difficult words by pointing to them, 3) reading while paying attention to correct intonation, emphasis, and pauses, 4) being able to show the relationship of difficult words to background knowledge with guidance, 5) beginning to be able to read silently, 6) using language patterns to predict how to read, 7) relying on pictures to understand text, 8) relying on one's own spoken vocabulary and spoken language structure, and 9) reading without spelling. Nurlaili, Supriatna, and Sapriya state that the introduction of basic literacy in elementary schools can be done through learning media. Learning media can be used to create a fun learning environment (Sembiring et al., 2025). Thus, teachers need to facilitate students' development of basic literacy skills through the school learning process.

3. Research Methodology

This research uses research and development (R&D) with the Borg & Gall model (Gall et al., 1996). This study aims to develop and test the effectiveness of Mobile Text Levelling. Media based on the wisdom of local Semarang, through ten steps as follows.

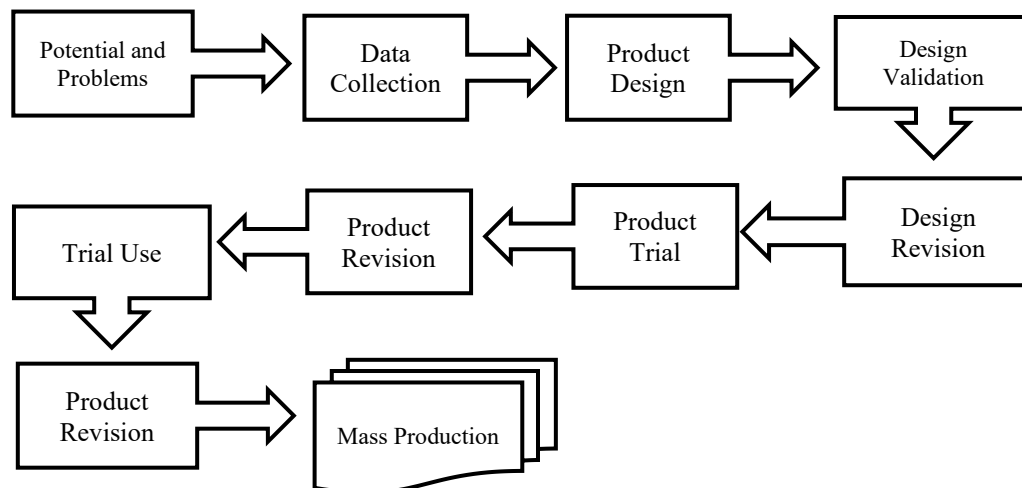


Figure 1. Steps Study and Development (R&D)

According to research needs and time constraints, the researcher... takes only 7 stages/steps in research & development. Here is a detailed explanation of the procedure study.

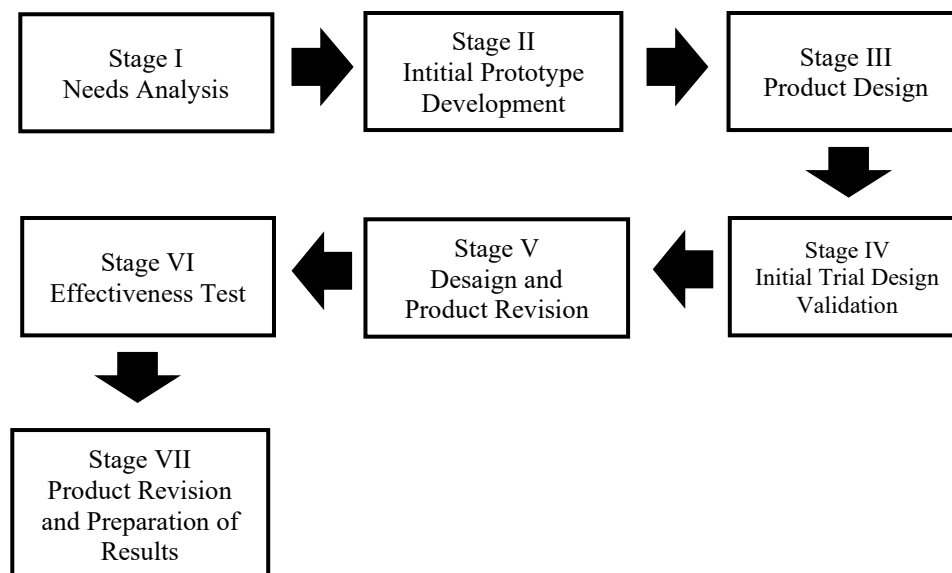


Figure 2. Procedure Study MTLM Development based on local wisdom.

The subjects in this research and development comprise 3 parts: the needs analysis stage, the media development stage, and the media effectiveness testing stage. Where is the Lab School UNNES? Details are subject to research and development. This is as follows: subject study development. There is 1 teacher and 22 students in a class in an elementary school.

Table 1. List Research Subject Details

Activity	Participant	Description
Stage Analysis Need	Students and Grade I Teachers SD Lab school UNNES	
Stages of development of media	Researcher	1. Design 2. <i>Prototype</i> 3. Revision 4. Finalization Media
	Team Expert	Team expert Media, Language, and Wisdom Local
Stages Implementation media	Students and Teachers of Class I SD Lab school UNNES	Implementation of MTLM media based on local wisdom in learning with <i>pretest</i> and <i>posttest</i> .

This research involved first-grade elementary school students and teachers, who were the primary participants in the media development and testing process. Based on research data, twenty-two first-grade students and one first-grade teacher at SD Lab School UNNES were directly involved in the media implementation phase. Furthermore, during the needs analysis phase, researchers interacted with other teachers and students through interviews, observations, and questionnaires to obtain an in-depth understanding of basic literacy conditions and the need for relevant learning media.

The sampling technique used in this study was purposive sampling. The selection of schools, teachers, and students was based on their suitability for the research objectives: schools addressing basic literacy issues among early-grade students, not yet having literacy media to support hybrid learning, and willing to participate in media testing and evaluation. Purposive participant selection allowed researchers to focus on groups that truly needed the development of more innovative literacy media. Inclusion criteria for this study included first-grade students who regularly attended lessons and were willing to participate in a series of research activities, including pretests, media use, and posttests. First-grade teachers, who played a direct role in the learning process, were also included as key participants. Furthermore, the research involved media experts, linguists, and local wisdom experts to assess the feasibility of the product being developed.

Conversely, participants who were unable to complete the entire trial, including students who were absent at crucial stages or those with special needs that required a learning approach different from the research focus, were excluded from the process. By establishing clear inclusion and exclusion criteria, this study ensured that the results of the Mobile Text Leveling Media (MTLM) feasibility and effectiveness test reflected conditions that truly aligned with the target of developing basic literacy media.

Instrument used in the study. This is as follows.

Table 2. Instrument Study

Activity	Instrument
Analysis Stage Need	Questionnaire (Open and closed), interview, Observation, Documentation. (Data is analysed using descriptive statistics.
Stages development media	Sheet evaluation eligibility media based on expert media and subject matter expert, questionnaire responses from teachers and students.
Test Stages	Test ability literacy base (Analysed using t-test and N-Gain).
Effectiveness Product	

The data collection instruments in this study consisted of questionnaires, interview guides, observation sheets, and basic literacy skills tests administered as pretests and posttests. Each instrument was developed through several stages to ensure its suitability for the research objectives and to ensure its validity and reliability.

The instrument development stage began with the development of indicators based on research needs, particularly those related to students' basic literacy skills, student responses to media, and the appropriateness of media from an expert perspective. These indicators then served as the basis for developing instrument items. The questionnaire and observation sheets were designed in a mixed format, comprising both closed- and open-ended questions, to collect both quantitative and qualitative data that enriched the analysis.

To ensure content validity, all instruments were validated by media experts, linguists, and local wisdom experts. The experts examined the similarity of the indicators, the clarity of the language, the measurability of the items, and the suitability of the instruments for use with first-grade students. Instrument reliability was assessed using readability tests and limited field trials conducted with several students outside the main sample who shared similar characteristics. On the observation sheet, researchers also ensured reliability through interobserver agreement, namely, the agreement between the two observers' assessments. Therefore, the observation instrument was deemed consistent and suitable for assessing student behaviour and responses during media use.

Pretests and posttests were developed to match the difficulty level of the early reading material, which included word recognition, simple word comprehension, and reading levelled texts. Test items were adapted to the characteristics of first-grade students and pretested to assess their level of difficulty and discriminatory power before being used with the research sample.

The collected data were analysed using a mixed methods approach in accordance with the research and development design. Quantitative data from questionnaires and pretest–posttest results were analysed using descriptive and inferential statistics. Descriptive analysis was used to display average scores, percentages, and general trends. In contrast, inferential analysis, in the form of paired t-tests, was used to determine differences in students' literacy skills before and after media use. Furthermore, N-gain calculations were used to assess the level of improvement in basic literacy skills in greater depth.

Qualitative data analysis was conducted on interview results, observation notes, and student and teacher responses. The data were analysed using thematic analysis techniques through the stages of data reduction, data presentation, and conclusion drawing, as recommended by Miles, Huberman, and Saldana (2014). This approach enabled researchers to identify patterns, trends, and in-depth findings regarding student and teacher responses to the developed media. The integration of these two types of analysis provides a comprehensive understanding of the feasibility and effectiveness of Mobile Text Leveling Media (MTLM).

Throughout the research process, the identities of students and teachers were fully protected by using anonymity codes for all collected data. Data was used solely for research purposes and was stored securely to prevent misuse. During the learning process, the researchers ensured that all activities did not disrupt regular learning and posed no physical or psychological risks to students. By maintaining these ethical safeguards, the research was conducted in accordance with applicable educational research ethics standards.

4. Results and Discussion

As explained in the methodology section, this study uses quantitative and qualitative analysis techniques. To analyse the impact of Mobile Text Leveling Media (MTLM) based on Semarang local wisdom on literacy skills, the researcher used a quantitative approach. On the other hand, to examine literacy skills before and after the module's use, as well as changes in children's prosocial behaviour, a qualitative approach was used. Quantitative analysis was conducted for module development, from needs analysis to module evaluation. Here is the explanation:

4.1. Needs Analysis

Needs analysis is an activity conducted to determine whether coaching will be provided. In this process, researchers conduct a needs analysis and identify various problems in early-grade literacy activities. To obtain this data, questionnaires were distributed (open and closed) about the importance of Mobile Text Leveling Media. Interviews with 20 teachers and students were also conducted using open questions. The researcher conducted observations of learning activities in class 1. The data were analysed using descriptive statistics. The needs analysis focused on implementing literacy activities in grade 1 of elementary school. The purpose of the analysis was to assess the use of mobile text leveling media to improve children's literacy. Data for the analysis of the need for Mobile Text Levelling Media to improve the literacy skills of early-grade students were collected through questionnaires administered to students. The findings of this analysis are available in Table 1.

Table 3. Frequency Distribution of Needs Analysis

No.	Needs Analysis	Frequency	Percentage
1	Very needed	4	25
2	Needed	10	50
3	Just Needed	3	12.5
4	Less Needed	3	12.5
5	Not needed	-	0
Overall		20	100

Based on the frequency distribution of Table 2 given for the needs analysis, it can be seen that the category "very much needed" represents 25% of the responses, the category "needed" represents 50%, the category "quite needed" represents 12.5%, the category "less needed" represents 12.5%, and the category "not needed" represents 0%. These results indicate that the category "needed" has the highest percentage compared to other categories. Therefore, it can be concluded that there is demand among students for mobile text-levelling media for learning, especially to improve literacy skills through this application. In addition to the quantitative data, qualitative data were obtained through in-depth interviews with teachers and parents.

The conclusion drawn from in-depth interviews with them is that they generally do not understand how to implement effective early-grade literacy, nor how to integrate media appropriate

to the environments where children grow and develop. In addition, after the researcher asked about the creation of Mobile Text Levelling Media integrating local wisdom from the city of Semarang that can be accessed on Android, they were generally very happy. They really hope that, soon after that, considering how difficult it is to find books with local wisdom in Semarang. In addition, their willingness to seek out and read books is low.

Based on the data and information above, it is necessary to create Mobile Text Levelling Media based on Semarang local wisdom by developing appropriate learning designs that meet students' needs. It is hoped that by using this module, parents will recognise their role in the family. This application is designed to be as easy and interesting as possible, so that parents can understand it easily and students find it interesting to read on their mobile phones, helping improve literacy skills.

4.2. Early Prototype Development

After analysing the needs and identifying the problems, Mobile Text Levelling Media (MTLM) was designed. The media prototype uses the Google Site feature. This Google Site is selected because its features are easy to use and free for media development. Researchers use several texts, images, and videos linked from the site's button. After the Google Site design is ready, the link is shared with readers, and then it is uploaded to the Geyser App website so it can be accessed on an Android mobile.

4.3. Product Design

The steps for developing Mobile Text Levelling Media (MTLM) based on Semarang local wisdom begin with designing materials, tiered texts, and assessment instruments. Mobile Text Levelling Media (MTLM) based on Semarang local wisdom is designed attractively by combining images, text, and sound. Mobile text levelling media based on local wisdom feature texts arranged in tiers, from simple to complex, to support the development of student literacy. The tiered texts are designed to present various forms of local wisdom originating from Semarang City, Central Java.

The levelled texts include: levelled text AD, which includes the text "Typical Food in Semarang City" (levelled text A), the text "Old City of Semarang" (levelled text B), the text "Bandeng Presto" (levelled text C), the text "Grand Mosque of Central Java" (levelled text D), and developer profiles. Levelled texts in Mobile Text Levelling Media (MTLM) teach basic literacy skills to first-grade elementary school students. The media also help students understand their surroundings. Finally, the assessment instrument is designed to make it easier for class teachers to evaluate students' basic literacy in their initial reading skills. The following is a display of Mobile Text Levelling Media (MTLM) based on Semarang local wisdom:



Figure 3. Front View

4.4. Initial Trial Design Validation

Test validation. First, as obtained from the questionnaire evaluation, the expert media is 117, with a total score of 125. Mark the obtained through the total score 18. For aspects, total score 10

for the visual arrangement aspect, total score 18 for the selection aspect font, total score 14 for the colour aspect, total score 10 for audio in media, total score 14 for the instructions aspect in the media, total score 14 for the buttons aspect navigation, total score 10 for interactivity, and total score 9 for the aspect of practicality. From the results, it can be concluded that Mobile Text Levelling Media is based on Wisdom Local and is very suitable for use without revision by a media expert. Test validation: First, the value obtained from the questionnaire evaluation expert material is 100, with a total score of 105. Mark the obtained score out of a total of 10. For aspects of objectives and indicators, the total score is 22 for aspects of material presentation, the total score is 5 for the practice aspect, the total score is 13 for the practice/evaluation aspect, the total score is 10 for use of material for cognitive development, the total score is 10 for use material for psychomotor development, and a total score of 30 for grammatical relevance. From the results, they can conclude that Mobile Text Levelling Media Based on Wisdom Local is very suitable for use without revision by a media expert.

4.5. Design and Product Revisions

Several things have been revised in the product, namely the background colour selection. Previously, a background colour clashed with the letter colour, making some words less readable. Therefore, the researcher changed the application's background colour to be more contrasting with the text colour.

4.6. Effectiveness Test

Product effectiveness testing is carried out quantitatively.

Table 4. Results Test t-Test

Text Levelling	Dk	α	t table	t count	Conclusion	Criteria
Text	12	5%	-1,710	-19,441	t count $\leq$ t table	
Leveling A					-19,441 $\leq$	-1,710
Text				-17,931	t count $\leq$ t table	
Leveling B					-17,931 $\leq$	-1,710
Text				-18,856	t count $\leq$ t table	
Leveling C					-18,856 $\leq$	-1,710
Text				-13,811	t count $\leq$ t table	
Leveling D					-13,811 $\leq$	-1,710

With mark dk = 12 and α = 5%, so that the mark t table is as big as -1,710. Based on the calculations of the learning outcomes for level A texts, the calculated t-value is as large as -19,441. So, it can be said that mark t count $\leq$ t table that is -19,441 $\leq$ -1,710.

On text results, Study levelling level B mark t count $\leq$ t table that is -17,931 $\leq$ -1,710.

On results, Study text levelling level C mark t count $\leq$ t table that is -18,856 $\leq$ -1,710.

On results, Study text levelling level D value t count $\leq$ t table, namely -13,811 $\leq$ -1,710.

Based on the calculation, the null hypothesis (H_0) rejected And H_1 accepted as well as can it was concluded that the pretest and posttest data on the basic literacy variables were in the form of read the beginning of each level of leveling text obtained at the time the research found that there was a difference in pretest and posttest values of less than zero so that mark pretest less than posttest score.

The n-gain test aims to determine the criteria for assessing increases in pretest and posttest scores. posttest literacy skills. Following is the calculation test n- gain :

Table 5. Results Test N-Gain

Text Leveling	Average <i>Pretest</i>	Average <i>Posttest</i>	Score Maximum Ideal	<i>N-gain</i>	Criteria
Text Leveling A	53.7	88.4	100	0.7798	tall
Text Leveling B	55.2	90.3	100	0.80545	tall
Text Leveling C	50.8	90.3	100	0.82343	tall
Text Leveling D	57.3	88.4	100	0.74969	tall

Basic literacy of grade I elementary school students in the levelling texts, level A, average score. The pretest score was 53.7, and the average posttest score was 88.4. Meanwhile, the maximum score is 100. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts A increased to the High category.

Basic literacy of grade I elementary school students: average score on the levelled texts, level B. The pretest score was 55.2, and the average posttest score was 90.3. Meanwhile, the maximum score is 100. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts B increased to the High category.

Basic literacy of grade I elementary school students, with an average score on the levelled text at level C. The pretest score was 50.8, and the average posttest score was 90.3. Meanwhile, the maximum score is 100. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts C increased to the High category.

Basic literacy of grade I elementary school students on the levelling text level D average score. The pretest score was 53.7, and the average posttest score was 57.3. Meanwhile, the maximum score is 88.4. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts D increased to the High category.

4.7. Product Revision and Compilation of Results

The revision of Mobile Text Levelling Media Based on Local Wisdom of Semarang was conducted by the researchers.

5. Discussion

The results of this study indicate that the development of Mobile Text Levelling Media (MTLM) based on Semarang local wisdom had a significant impact on improving the basic literacy skills of first-

grade elementary school students. The increase in pretest-to-posttest scores across all text levels (A, B, C, and D), accompanied by a high N-gain score, indicates that this media successfully facilitated early reading development in a gradual, systematic manner. These findings support various theories regarding the importance of providing levelled texts (text levelling) in early reading instruction, especially for lower-grade students transitioning from preschool to academic literacy.

In general, the findings of this study align with previous research showing that the use of digital media can improve children's motivation, concentration, and reading ability. Almgren Bäck et al. (2024), for example, suggest that assistive technology and digital media can help students improve their reading and writing skills through richer interactions, the use of supporting visuals, and more accessible text structures. Similarly, research by Dey & Munshi (2025) shows that digital media designed with child-friendly visual elements and navigation can significantly improve early literacy mastery. These similarities indicate that presenting text in digital format can provide both cognitive and affective support for young learners, especially when the media is easy to use and encourages interactivity.

Furthermore, the expert validation results of MTLM reinforce the research findings of Minto (2024), which emphasised that the suitability of media design, language clarity, and the appropriateness of the material to the local learning context are important factors in increasing the effectiveness of language learning. The findings of this study indicate that the visual, auditory, and navigation aspects of MTLM were deemed highly usable by media and material experts, suggesting that the quality of media design is a crucial factor in supporting early literacy development. These similarities strengthen the argument that digital media designed based on instructional design principles can contribute to consistent improvements in learning outcomes (Suminar et al., 2025).

However, this study differs fundamentally from previous research, which generally focused on generic digital media or printed modules to improve basic reading skills. Previous research rarely examined literacy media that integrate graded texts with local wisdom content as an integral part of reading skill development. MTLM presents texts at four difficulty levels, ranging from simple descriptive texts to more complex information, all based on the Semarang culture. This local content, including local cuisine, city icons, and historical sites, not only helps students comprehend reading but also strengthens their connection to their socio-cultural environment. This integration makes a new contribution to the literature, namely, that literacy learning aims not only to improve reading skills but also to build connections to children's cultural identities and contexts.

This research also contributes to the debate regarding family involvement in early literacy. Field findings indicate that before the intervention, many parents lacked appropriate reading resources to support their children. When MTLM was introduced, parents stated that the media helped them understand how to support their children in reading in a more engaging and accessible format. This finding expands on the idea proposed by Nwagwu & Maxwell (2025) regarding the importance of a "home scholarly culture" in developing children's reading interests. With MTLM, learning is not only centered at school but can also continue at home via mobile devices. Thus, this research contributes to the literature by presenting a media model that strengthens collaboration between teachers, students, and parents.

From a pedagogical perspective, this study reaffirms the importance of a multimodal approach in basic literacy learning. MTLM presents text, images, and audio in harmony, enabling students to process information through multiple sensory pathways. This approach aligns with multimodal literacy theory, which emphasises that meaning is constructed through the interaction of multiple modalities. The results showed that students more easily comprehend text content when relevant supporting images are integrated, and audio narration helps them navigate the text's structure. This extends the findings of Kırımı et al. (2025), who demonstrated that ICT integration can improve

literacy skills and understanding of science in elementary school students. Meanwhile, the methodological contribution of this study lies in the application of the Borg & Gall model to the context of developing local culture-based literacy media. The seven-stage development process, from needs analysis to final product revision, demonstrates that R&D procedures are not only relevant to developing technical learning tools but also to creating contextual and child-friendly literacy media. The combination of validation by media experts, linguists, and local wisdom experts represents a comprehensive approach that has not been widely used in similar research. Thus, this study adds to the literature on the methodology for developing culture-based literacy media.

6. Conclusion

This research is effective in improving the ability to understand basic literacy. The development of Mobile Text Levelling Media learning media based on Local Wisdom is carried out in 7 stages. Mobile learning media, Text Levelling Media Based on Local Wisdom of Semarang, is declared very feasible by materials and media experts to be applied in the learning process to increase basic literacy skills. The contribution of this study is to provide an alternative learning medium that is more interesting and interactive for elementary school students. The basic literacy of grade I elementary school students on levelling texts at level A has an average value of The pretest score was 53.7, and the average posttest score was 88.4. Meanwhile, the score that can be obtained is 100.

Based on the calculation using the n-gain formula, students' basic literacy in leveling texts A experienced an increase in the High category. Basic literacy of grade I elementary school students on the average score of the leveled texts, level B. The pretest score was 55.2, and the average posttest score was 90.3. Meanwhile, the score that can be obtained is 100. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts B increased to the High category. Basic literacy of grade I elementary school students, with an average score on the leveled text at level C. The pretest score was 50.8, and the average posttest score was 90.3. Meanwhile, the maximum score is 100. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts C increased to the High category. Basic literacy of grade I elementary school students on the levelling text at level D: average score. The pretest score was 53.7, and the average posttest score was 57.3. Meanwhile, the maximum score is 88.4. Based on the calculation using the n-gain formula, students' basic literacy in levelling texts D increased to the High category.

This study confirms that improving basic literacy in first-grade students depends not only on the provision of reading materials but also on the appropriateness of the media format for the child's learning style. The use of graded texts, combined with visual displays, simple navigation, and local wisdom content, has been shown to produce a learning experience that better aligns with children's developmental needs and the realities of their environment. Therefore, an effective literacy approach involves not only providing easy texts but also providing meaningful contexts and media that enable children to actively engage. The development of MTLM demonstrates that the literacy process in early childhood can be strengthened by integrating technology with local content, so that learning not only supports reading skills but also builds children's cultural identity and a sense of closeness to their surroundings. This study also shows that collaboration between teachers, parents, and technology can create a more inclusive literacy space, both at school and at home. Innovation in basic literacy media needs to be directed towards a tiered, contextual, and easily accessible learning model, especially for early grades at the foundation stage. The findings of this study open opportunities to expand the development of local wisdom-based literacy media across various regions and encourage the use of technology that is more sensitive to children's needs and the characteristics of early learning.

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Declarations

Conflicts of Interest. The author declares no conflicts of interest.

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