

ENHANCING PRE-SERVICE SPECIAL EDUCATION TEACHERS' PEDAGOGICAL COMPETENCE IN TEACHING READING COMPREHENSION TO HEARING-IMPAIRED ELEMENTARY STUDENTS THROUGH FOTONOVELA MEDIA

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Abstrak

Kemampuan membaca pemahaman merupakan keterampilan literasi dasar yang penting bagi siswa tunarungu untuk mengakses informasi akademik dan berpartisipasi dalam kehidupan sosial. Namun, keterbatasan input auditorik dan perkembangan bahasa sering menimbulkan hambatan dalam memahami teks. Penelitian ini bertujuan meningkatkan kompetensi pedagogik calon guru pendidikan khusus dalam pembelajaran membaca pemahaman siswa tunarungu melalui penggunaan media fotonovela. Penelitian menggunakan desain quasi-eksperimen dengan pendekatan pretest–posttest non-equivalent control group dan dilaksanakan di SLB Pangudi Luhur dan SLB Santi Rama sebagai konteks pembelajaran autentik. Subjek penelitian adalah calon guru pendidikan khusus yang dibagi ke dalam kelompok eksperimen dan kontrol. Intervensi dilakukan melalui pelatihan dan praktik pembelajaran menggunakan media fotonovela yang mengintegrasikan dukungan visual, SIBI, dan prinsip Metode Maternal Reflektif (MMR). Hasil pretest menunjukkan kemampuan awal kedua kelompok relatif setara, sedangkan posttest menunjukkan peningkatan signifikan pada kelompok eksperimen. Penggunaan fotonovela terbukti meningkatkan kompetensi pedagogik calon guru, terutama dalam perencanaan pembelajaran, strategi visual, dukungan bahasa dan komunikasi, praktik adaptif, dan keterlibatan siswa. Peningkatan kompetensi guru berdampak pada kemampuan membaca pemahaman siswa tunarungu, termasuk pemahaman kosakata, ide pokok, urutan peristiwa, unsur cerita, kemampuan menjawab pertanyaan, inferensi sederhana, dan merangkum bacaan. Temuan ini menunjukkan bahwa media fotonovela merupakan pendekatan inovatif dan berkelanjutan untuk meningkatkan kompetensi pedagogik guru sekaligus mendukung literasi siswa tunarungu.

Kata Kunci: kompetensi pedagogik, membaca pemahaman, siswa tunarungu, fotonovela, pendidikan berkualitas

Abstract

Reading comprehension is a fundamental literacy skill that is essential for deaf or hard-of-hearing students to access academic information and participate in social life. However, limited auditory input and language development challenges often create barriers to understanding written texts. This study aimed to enhance the pedagogical competence of pre-service special education teachers in teaching reading comprehension to hearing-impaired students through the use of fotonovela media. The study employed a quasi-experimental design using a pretest–posttest non-equivalent control group approach and was conducted at SLB Pangudi Luhur and SLB Santi Rama as authentic learning contexts. The participants were pre-service special education teachers divided into experimental and control groups. The intervention involved training and teaching practice using fotonovela media integrating visual supports, the Indonesian Sign System (SIBI), and principles of the Maternal Reflective Method (MMR). Pretest results indicated that the initial competence levels of both groups were relatively equivalent, while posttest results showed a significant improvement in the experimental group. The use of fotonovela media significantly improved the pedagogical competence of pre-service teachers, particularly in instructional planning, visual strategies, language and communication support, adaptive teaching practices, and student engagement. The improvement in teacher competence contributed to the development of students' reading comprehension skills, including vocabulary understanding, identifying main ideas, sequencing events, recognizing story elements, answering questions, making

simple inferences, and summarizing texts. These findings indicate that fotonovela media is an innovative and sustainable approach to strengthening teachers' pedagogical competence while supporting literacy development among deaf students.

Keywords: pedagogical competence, reading comprehension, deaf students, fotonovela, quality education

1. INTRODUCTION

Reading comprehension is a foundational literacy skill that enables students to access academic content, develop critical thinking, and participate meaningfully in society (Medranda-Morales et al., 2023). Strong reading comprehension supports lifelong learning, informed decision-making, and social participation. At a global level, literacy development aligns with the Sustainable Development Goals (SDGs), particularly SDG 4: Quality Education, which emphasizes inclusive and equitable education and the promotion of lifelong learning opportunities for all. Ensuring that children with disabilities acquire adequate literacy skills is also closely connected to SDG 10: Reduced Inequalities, as literacy proficiency helps reduce educational disparities and promotes social education competence.

For elementary students with hearing impairment, acquiring reading comprehension skills presents unique challenges due to limited auditory input, restricted vocabulary development, and differences in language acquisition pathways (Meristo & Surian, 2025). These challenges often result in delays in literacy development compared to hearing peers, making effective instructional strategies essential for supporting their reading comprehension growth (Lederberg et al., 2025). Without adequate comprehension skills, students with hearing impairment may face barriers in accessing curriculum content, academic achievement, and future employment opportunities.

Teachers play a crucial role in addressing these challenges. In special education settings, pedagogical competence is fundamental to ensuring that instruction is accessible, visually meaningful, and linguistically supportive (Fitias,

2025). Pre-service special education teachers must be equipped with the skills to design and implement strategies that accommodate the visual learning strengths of hearing-impaired students while bridging language (Açar & Demiralp, 2025). However, many teacher preparation programs still emphasize theoretical knowledge rather than practical, evidence-based approaches tailored to the literacy needs of deaf or hard-of-hearing learners (Fairbrother et al., 2025) As a result, future teachers may feel underprepared to teach reading comprehension effectively.

Visual-based instructional media have been widely recognized as effective tools for supporting literacy development among hearing-impaired learners (Mokhtar et al., 2025). Because these students rely heavily on visual input, instructional materials that integrate images, contextual storytelling, and sequential narratives can enhance comprehension and engagement (Nurjamin et al., 2025). One promising medium is the fotonovela, a visual storytelling format rooted in multimodal literacy theory and visual learning frameworks. Grounded in (Mayer, 2021) cognitive theory of multimedia learning and dual-coding principles, fotonovela leverages simultaneous visual and linguistic input to support meaning construction and comprehension. This theoretical foundation aligns with instructional design principles that emphasize the use of multiple modalities to reduce cognitive load and enhance learning outcomes, particularly for students with limited auditory access to language. By combining photographs with short text narratives, fotonovelas provide contextualized language input, support vocabulary development, and promote meaning-making through visual cues,

making them particularly suitable for students with hearing impairment.

Beyond benefiting students, the use of fotonovela media may also enhance teachers' pedagogical competence. By designing and implementing fotonovela-based instruction, pre-service teachers engage in active learning processes that include adapting content, integrating visual supports, scaffolding comprehension, and applying inclusive teaching strategies. This experience can strengthen their ability to deliver accessible literacy instruction and improve their confidence in teaching students with diverse learning needs.

Despite the potential benefits of visual storytelling media, existing studies on fotonovela-based instruction have predominantly focused on health communication and general literacy contexts, employed descriptive or qualitative methodologies, and have not examined its role in developing pre-service teachers' pedagogical competence within special education settings. No experimental studies have specifically investigated fotonovela as an instructional variable for strengthening teaching competence among pre-service teachers working with hearing-impaired learners. This gap underscores the need to examine the role of fotonovela-based instruction in strengthening pre-service teachers' pedagogical competence, particularly in the context of teaching reading comprehension to hearing-impaired elementary students. Therefore, this study aims to examine how the use of fotonovela media can enhance the pedagogical competence of pre-service special education teachers while supporting effective reading comprehension instruction for hearing-impaired learners.

This study contributes to advancing inclusive literacy education aligned with SDG 4 by promoting equitable access to quality learning and supporting teacher readiness to serve diverse learners. Additionally, it supports SDG 10 by addressing literacy barriers experienced by

students with hearing impairment. The findings are expected to inform innovative instructional practices in special education teacher preparation and provide practical insights into visually supported literacy instruction that promotes comprehension, inclusion, and educational equity.

2. METHOD

This study employed a quasi-experimental design using a pretest–posttest non-equivalent control group approach to examine the effectiveness of fotonovela media in enhancing the pedagogical competence of pre-service special education teachers in teaching reading comprehension to hearing-impaired elementary students. This design enabled the measurement of competence improvement before and after the intervention while allowing comparison between groups receiving different instructional treatments (Liao et al., 2024).

The study was implemented in authentic special education settings at SLB Pangudi Luhur and SLB Santi Rama, two special schools serving deaf and hard-of-hearing students. These schools provided real classroom environments in which pre-service teachers conducted reading comprehension instruction using fotonovela media. The implementation allowed participants to apply inclusive pedagogical strategies directly with hearing-impaired learners, integrating visual supports, SIBI (Sistem Isyarat Bahasa Indonesia), and principles of the Maternal Reflective Method (MMR) during instruction.

Through guided teaching practice, observation, and reflective feedback sessions conducted in these schools, pre-service teachers gained hands-on experience in designing and delivering visually supported reading instruction. The use of fotonovela media in real classroom contexts strengthened their pedagogical competence, particularly in visual scaffolding, language support, student engagement, and

adaptive instructional strategies tailored to deaf learners.

Conducting the intervention at SLB Pangudi Luhur and SLB Santi Rama ensured ecological validity by situating the training within authentic learning environments. This setting enabled pre-service teachers to develop practical teaching competence while simultaneously supporting the reading comprehension development of hearing-impaired elementary students.

The participants consisted of a total of 40 pre-service special education teachers enrolled in a teacher preparation program at Universitas Negeri Jakarta, divided into an experimental group ($n = 20$) and a control group ($n = 20$). They were divided into an experimental group, which received training and instruction using fotonovela media, and a control group, which received conventional instruction without the use of fotonovela. Participants were selected through purposive sampling to ensure that they had completed foundational coursework in special education and literacy instruction and possessed the prerequisite knowledge for participating in instructional practice activities.

The study was conducted within a teacher education program and involved structured instructional practice sessions designed to simulate and support the teaching of reading comprehension to hearing-impaired elementary students. The experimental group participated in a fotonovela-based instructional program that included an introduction to visual literacy and inclusive reading instruction, training on the design of fotonovela-based learning materials, implementation of fotonovela in reading comprehension lessons, and reflection sessions accompanied by pedagogical feedback. The intervention was carried out over several instructional sessions to provide sufficient practice and skill development.

Multiple instruments were used to collect data. A pedagogical competence observation rubric was employed to assess participants'

abilities in instructional planning, visual scaffolding strategies, language support techniques, inclusive teaching practices, and classroom engagement strategies. A reading comprehension instruction performance assessment evaluated participants' effectiveness in delivering reading comprehension lessons to hearing-impaired learners. Reflective journals were used to capture participants' pedagogical insights, challenges, and professional growth during the intervention. In addition, a questionnaire on instructional confidence measured changes in participants' teaching confidence before and after the intervention.

Data collection procedures began with a pretest to assess participants' initial pedagogical competence. This was followed by the fotonovela-based instructional training and teaching practice sessions for the experimental group and conventional instruction for the control group. After the intervention, a posttest was administered to reassess pedagogical competence. Reflective journals and questionnaires were then collected to obtain qualitative insights and measure changes in instructional confidence.

Quantitative data were analyzed using descriptive statistics, including means and standard deviations, to summarize competence scores. Paired sample t-tests were conducted to examine improvements in pedagogical competence within groups, while independent sample t-tests were used to compare differences between the experimental and control groups. Qualitative data obtained from reflective journals were analyzed using thematic analysis to identify recurring patterns and themes related to pedagogical development and instructional experiences.

Ethical considerations were carefully observed throughout the study (Nii Laryeafio & Ogbewe, 2023). Participants provided informed consent and were assured that their participation was voluntary (Iseselo & Tarimo, 2024).

Confidentiality and anonymity were maintained, and all data were used solely for research purposes. The content validity of all instruments was established through expert review conducted by three specialists in special education and literacy instruction. Each expert independently assessed the relevance, clarity, and representativeness of instrument items using a four-point rating scale. Item-level Content Validity Index (I-CVI) scores were calculated for each item, and only items achieving an I-CVI of 0.80 or higher were retained, consistent with established standards for content validity (Yusoff et al., 2021). The overall Scale-level CVI (S-CVI/Ave) for the pedagogical competence observation rubric was 0.89, indicating strong content validity. Inter-rater reliability was assessed using Cohen's Kappa ($\kappa = .84$), confirming substantial agreement among raters. These validation procedures ensured that all instruments accurately and comprehensively measured the targeted constructs of pedagogical competence and reading comprehension instruction effectiveness.

3. RESULTS AND DISCUSSION

The results of this study indicate that the use of fotonovela media significantly improved the pedagogical competence of pre-service special education teachers in teaching reading comprehension to hearing-impaired elementary students. Prior to the intervention, both the experimental and control groups demonstrated comparable levels of pedagogical competence. However, after the intervention, the experimental group showed a substantial improvement across all assessed competence indicators, including instructional planning, visual scaffolding, language support strategies, inclusive teaching practices, and classroom engagement techniques.

The improvement observed in the experimental group suggests that fotonovela-based instruction provides meaningful opportunities for pre-service teachers to integrate

visual supports, contextual language input, and inclusive instructional strategies. In contrast, while the control group also demonstrated slight improvement, the increase was minimal and likely attributable to general teaching practice experience rather than targeted instructional innovation.

The paired sample t-test results revealed a statistically significant increase in pedagogical competence scores in the experimental group, while the control group showed no statistically significant improvement. Furthermore, independent sample t-test analysis confirmed a significant difference between the posttest scores of the two groups, indicating the effectiveness of the fotonovela-based instructional intervention.



Image 1. Fotonovela cat breeding



Image 2. Fotonovela about animals



Image 3. Fotonovela caring for pets

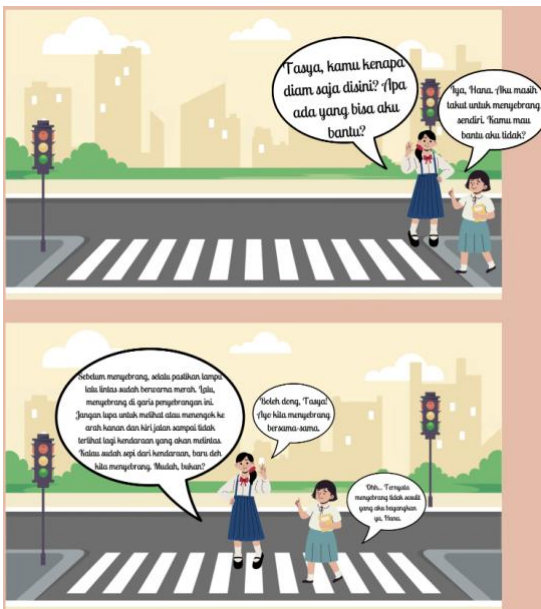


Image 4. Fotonovela how to cross the street

Table 1. Pretest–Posttest Pedagogical Competence Scores

Group	Pretest	Posttest	Gain
Experimental	68.40	85.72	17.32
Control	69.12	73.08	3.96

Table 2. Improvement in Pedagogical Competence Indicators

Indicator	Pre	Post	Gain
Planning	67.8	86.4	18.6
Visual Scaffolding	66.5	88.1	21.6
Language Support	69.2	85.3	16.1
Teaching Practice	70.1	87.6	17.5
Engagement	68.4	81.2	12.8

Table 3. Pedagogical Competence in Teaching Hearing Impairment Students

Competence Area	Description
Instructional Planning	Designing structured and accessible lessons aligned with students' language levels and visual learning needs, including clear objectives, adapted reading materials, visual supports, vocabulary pre-teaching, and step-by-step instructional sequencing. Planning incorporates Maternal Reflective Method (MMR) principles by linking language to meaningful daily experiences and integrating SIBI signs to support language comprehension and concept development. This structured and contextual planning strengthens students' background knowledge, helps them connect written words with real-life experiences, and supports deeper understanding of text meaning.

Visual Teaching Strategies	Employing systematic visual scaffolding such as pictures, real objects, graphic organizers, gestures, demonstrations, modeling, and visual sequences to clarify concepts and support meaning-making. Instruction integrates SIBI signs, facial expressions, and contextual visual cues to reinforce understanding through visual communication channels. These visual supports provide contextual clues that help students interpret vocabulary, sentence relationships, and narrative structure, thereby improving overall reading comprehension.	MMR practices by fostering interactive language experiences and uses SIBI to ensure clarity of instructions and comprehension during reading activities. Progressive scaffolding and clear communication reduce cognitive load and support students in processing, interpreting, and retaining textual information.
Language & Communication Support	Using accessible language and multimodal communication by simplifying sentence structures, emphasizing key vocabulary, pre-teaching unfamiliar terms, and reinforcing meaning through repetition and contextual visuals. Communication incorporates SIBI and applies MMR principles, encouraging natural language interaction, meaningful dialogue, and language acquisition through real-life contexts. This approach enhances vocabulary acquisition, semantic understanding, and sentence interpretation, enabling students to comprehend written texts more accurately.	Promoting active participation through interactive and visually supported activities such as guided questioning, visual prompts, collaborative tasks, hands-on activities, and visual storytelling. Engagement is strengthened through MMR-based conversational interaction and the use of SIBI to encourage expressive communication and student responses. Active engagement encourages students to construct meaning, monitor understanding, and develop confidence in interacting with written texts.
Teaching Practice	Adapting instructional delivery to accommodate diverse learning needs by modifying pacing, providing individualized support, scaffolding tasks progressively, and using multimodal teaching approaches. Instruction reflects	Implementing fair and accessible assessment methods by using visual-based comprehension checks, performance tasks, demonstrations, matching or sequencing activities, and alternative response formats. Assessment allows responses through SIBI, visual demonstrations, and reflective language expression consistent with MMR communication practices. These assessment approaches provide accurate measures of comprehension and reinforce understanding by allowing students to

demonstrate meaning through visual and expressive responses rather than relying solely on written language.

Table. 4 Reading Comprehension Skills Developed in Hearing Impairment Students

Reading Comprehension Skill	Detailed Description
Vocabulary Understanding	Students recognize and understand key words in the text by matching words with pictures, demonstrating vocabulary using SIBI signs, and identifying meanings through visual context and repeated exposure.
Identifying Main Ideas	Students determine the central message or topic of a passage by selecting relevant images, identifying the topic, and expressing the main idea through signs, gestures, or simple written responses.
Understanding Supporting Details	Students identify important details that explain or support the main idea by pointing to visual cues, selecting relevant information, and linking details to the overall meaning of the text.
Sequencing Events	Students understand narrative order by arranging picture sequences correctly, recognizing beginning–middle–end structure, and retelling events in logical order using signs or visual aids.
Recognizing Characters, Setting, and Events	Students identify story elements such as characters, locations, and events by interpreting visual representations and expressing responses through

Answering WH-Questions	SIBI, gestures, or visual selection. Students demonstrate comprehension by responding to who, what, where, when, and why questions using signs, gestures, pictures, or brief written responses.
Making Simple Inferences	Students draw meaning beyond literal text by predicting outcomes, explaining events, and interpreting visual and contextual clues within the story.
Summarizing Content	Students retell the main points of a text using signs, pictures, or short phrases, demonstrating understanding of essential information and story structure.
Connecting Text to Experience	Students relate text meaning to personal experiences or familiar situations, strengthening comprehension through meaningful connections and MMR-based conversational interaction.

DISCUSSION

The findings demonstrate that fotonovela-based instruction effectively enhances pedagogical competence among pre-service special education teachers. The largest improvement occurred in visual scaffolding strategies, indicating that the integration of image-based storytelling strengthens teachers' ability to present information visually an essential instructional adaptation for hearing-impaired learners (Sailuddin et al., 2025). This aligns with research highlighting the importance of visual supports in improving comprehension and engagement among deaf and hard-of-hearing students (Gehret & Elliot, 2023).

The findings further indicate that the improvement in pre-service teachers' pedagogical competence may have contributed to the development of reading comprehension skills among hearing impairment students. The integration of visual scaffolding, contextual language support, and structured instructional sequencing enabled students to access text meaning more effectively. Through fotonovela-based instruction, students demonstrated improved vocabulary recognition, as they were able to match words with images and express meanings using SIBI. This visual linguistic reinforcement supported semantic understanding and reduced barriers caused by limited auditory input (Oliveira-Buckley et al., 2026).

Students also showed progress in identifying main ideas and supporting details, suggesting that visual narratives and contextual cues helped them focus on essential information within the text. The sequential visual format of fotonovela facilitated students' ability to understand story structure, sequence events, and recognize characters, settings, and plot development. These improvements indicate that visual storytelling supports narrative comprehension by providing concrete representations of abstract textual information.

Furthermore, the use of simplified language, repetition, and multimodal communication strengthened students' ability to answer WH-questions and interpret text meaning. The application of the Maternal Reflective Method (MMR) encouraged meaningful language interaction, allowing students to connect textual content with real-life experiences. This connection enhanced comprehension and supported students in making simple inferences and retelling story content.

Active engagement strategies, including guided questioning, visual prompts, and collaborative storytelling, increased students' participation and confidence in expressing understanding. The opportunity to respond using

SIBI, gestures, or visual representations enabled students to demonstrate comprehension in accessible ways, thereby providing a more accurate reflection of their understanding (Dostal et al., 2025).

The findings suggest that visually enriched instruction supported by MMR principles and SIBI not only improves access to text but also strengthens essential reading comprehension skills, including vocabulary understanding, identifying main ideas, sequencing events, inference-making, and summarizing content. These results reinforce the importance of visually supported and linguistically accessible instruction in improving literacy outcomes for deaf and hard-of-hearing learners. The study therefore highlights the dual impact of fotonovela-based instruction: enhancing teacher competence while simultaneously improving students' reading comprehension development.

The study highlights the potential of fotonovela media as an innovative pedagogical tool that not only supports literacy development in hearing-impaired students but also strengthens the instructional competence of future special education teachers (Azzarito, 2023). By combining visual narratives with contextual language input, fotonovela facilitates meaningful comprehension and enhances students' engagement with written texts. Moreover, its integration into teacher preparation programs promotes quality education instructional practices and equips future educators with practical strategies to address the diverse literacy needs of deaf and hard-of-hearing learners.

4. CONCLUSION

This study demonstrates that the use of fotonovela media effectively strengthens the pedagogical competence of pre-service special education teachers in teaching reading comprehension to hearing-impaired elementary students. The quasi-experimental results revealed significant improvements in instructional

planning, visual scaffolding, language and communication support, adaptive instructional practices, and strategies for fostering student engagement. The authentic teaching experiences at SLB Pangudi Luhur and SLB Santi Rama provided opportunities for pre-service teachers to implement inclusive pedagogical approaches in real classroom settings, thereby enhancing their practical teaching skills and professional confidence.

The integration of visual storytelling through fotonovela, supported by SIBI (Sistem Isyarat Bahasa Indonesia) and the Maternal Reflective Method (MMR), created a visually accessible and linguistically supportive learning environment that may have contributed to measurable improvements in students' reading comprehension skills. Students demonstrated progress in vocabulary understanding, identifying main ideas and supporting details, sequencing events, interpreting story elements, answering WH-questions, making simple inferences, and summarizing text meaning. These findings highlight the importance of visually enriched and contextually meaningful instruction in improving literacy outcomes for deaf and hard-of-hearing learners, while also supporting the advancement of inclusive quality education (SDG 4) and reducing educational inequalities (SDG 10). Future research is recommended to explore long-term impacts and broader implementation of fotonovela-based instruction across diverse educational contexts.

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