



Microlearning Instructional Design with Process Approach for Improving Early Reading Skills of Prospective Elementary School Teachers

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Abstract

Teaching early reading is a crucial skill for prospective elementary school teachers. However, in practice, there is a persistent observation of a low mastery of teaching methods in this area which is a mandatory pedagogical competency for teachers. This study aimed to describe the improvement of college students' proficiency in teaching early reading through microlearning-based instructional design with a process approach. The process approach refers to the implementation of the stages of reading instruction, namely in the pre-reading, during reading and post-reading stages. This study uses quantitative and qualitative data through tests, field notes, and documentation. The N-Gain test was utilized to analyze the quantitative data, employing one-group pretest and posttest design. Concurrently, the qualitative data from field notes and documentation underwent analysis through display, reduction, and verification data. The results of this study indicate that the implementation of microlearning-based instructional design with a process approach significantly enhances the early reading teaching skills of prospective elementary school teachers. Notably, improvements are observed across in the pre-reading, during-reading, and post-reading stages. The impact is particularly pronounced in the during-reading stage, where collage students exhibit enhanced mastery of teaching methods and adept use of appropriate media. The conclusion of this study shows the efficacy of an instructional design tailored to and focused on the specific needs of learning segments, which provides a better learning experience in teaching early reading.

Keywords: *early reading, instructional design, microlearning, process approach.*

Abstrak

Pengajaran membaca permulaan menjadi salah satu kompetensi yang harus dikuasai mahasiswa calon guru sekolah dasar meskipun dalam praktiknya, ada pengamatan terus-menerus tentang penguasaan metode pengajaran yang rendah di area ini yang merupakan kompetensi pedagogik wajib bagi guru. Penelitian ditujukan untuk mendeskripsikan peningkatan keterampilan mahasiswa dalam pengajaran membaca permulaan melalui desain instruksional berbasis *microlearning* dengan pendekatan proses. Pendekatan proses ini mengacu pada penerapan tahapan pengajaran membaca yakni dalam tahap pra, saat, dan pasca membaca. Penelitian ini menggunakan data kualitatif dan kuantitatif dengan pengumpulan datanya melalui tes, catatan lapangan, dan dokumentasi. Hasil datanya dianalisis dengan statistik deskriptif melalui uji N-Gain berdasarkan hasil tes dari one group pretest and posttest design. Analisis juga dilakukan melalui data display, reduksi, dan verifikasi untuk hasil catatan lapangan dan dokumentasi. Hasil penelitian ini menunjukkan bahwa desain instruksional berbasis *microlearning* dengan pendekatan proses dapat meningkatkan keterampilan pengajaran membaca permulaan mahasiswa calon guru sekolah dasar dalam kategori cukup signifikan. Peningkatan ini meliputi pengajaran pada tahap pra, saat, dan pasca membaca permulaan khususnya pada tahap saat membaca dalam penguasaan metode dan penggunaan media yang tepat. Kesimpulannya menunjukkan bahwa desain instruksional yang didesain secara khusus dan terfokus dalam segmen-segmen pembelajaran memberikan pengalaman belajar yang lebih baik pada mahasiswa dalam pengajaran membaca permulaan.

Kata kunci: *desain instruksional, membaca permulaan, microlearning, pendekatan proses.*

INTRODUCTION

Reading is a fundamental literacy skill formally taught from an early age. In Elementary Schools, teaching reading is integrated into the Indonesian language curriculum. The process of teaching reading begins with letter recognition, word formation, sentence construction, and progresses to comprehending entire discourses (Khofifah & Ramadan, 2021). For instance, elementary students are introduced to diverse reading techniques, including scanning, skimming, intensive, and creative methods, each serving distinct purposes. Proficiency in these skills is considered the cornerstone for lifelong learning, encompassing various subjects and materials (Nuraniyah et al., 2022; Tahmidaten & Krismanto, 2020; Widyaningrum & Hasanudin, 2019; Young et al., 2020).

Given this context, the Indonesian language learning in elementary schools course at the elementary teacher education study program formulates its objectives to enable collage students to master diverse strategies, methods, and techniques in teaching the four primary language skills in reading. However, observations during the Odd Semester of 2022/2023, from September to November 2023, reveal that collage students' skills in teaching reading, especially early reading, remains low. During simulated reading activities for lower grades, collage students (prospective elementary school teachers) struggle to guide their students in spelling, particularly with words ending in combinations of vowels (diphthongs) and consonants, for instance, words like "me-no-long/pan-tai/i-khlas." Additionally, they exhibit a lack of proficiency in imparting good reading attitudes and an organized reading process, leading to less systematic reading instructions (reading without adequate preparation or

discussion of reading activity outcomes) in the practice of learning Indonesian during lectures in this odd semester.

The inadequacy in teaching early reading is primarily attributed to collage students' unfamiliarity with appropriate teaching methods. Many collage students simulate reading by spelling without adhering to a specific method, resulting in non-systematic teaching. For instance, observations indicate that collage students teach early reading by directly spelling sentences without introductory steps, repetition of letters, syllables, and words—crucial components in teaching early reading. Given the technical nature of teaching early reading, referencing specific methods such as the commonly used spelling method or the more complex SAS (structural analytical syntactic) method is imperative (Amendum & Liebfreund, 2019; Astuti et al., 2021; Desta, 2020). Consequently, collage students require more time and practice to proficiently master these various teaching methods. Mastery of this early reading teaching method becomes basic pedagogical competencies that teachers must master because many findings or cases reveal that in fact elementary school students still experience reading problems at the beginning of class. Teachers who teach in early grades must have good skills in solving elementary school students' early reading problems so as not to hinder advanced reading learning at the next grade level.

This identified problem serves as the background for this study to carry out problem solving efforts with the aim of improving the early reading teaching skills of prospective Elementary School teachers. Following the problem analysis carried out, the appropriate problem solving in this context is to design a special instructional design for teaching early reading for collage students in the Indonesian Language Learning in Elementary Schools course. Instructional design is realized in the form of systematic planning of materials, activities, and learning assessments for specific educational purposes. In this context, the instructional design will encompass indicators, materials, models, media, teaching tools, and assessment instruments, forming the basis for lesson planning (Amendum & Liebfreund, 2019; Chyl et al., 2023). Instructional design is used in this research because it will help college students to have a systematic and appropriate teaching framework for teaching early reading. Instructional design has been widely employed to enhance learning processes and outcomes across various competencies and educational levels (Drake & Wash, 2020).

Referring to the background revealed, this research is aimed at testing the microlearning instructional design with process approach in improving pedagogical competence of prospective teachers early reading teaching skills instructional design in the Indonesian Language Learning in Elementary Schools. Pedagogical competence serves as an indicator of teacher professionalism, reflecting mastery of appropriate learning techniques, methods, and strategies. This study focused specifically on teaching early reading, which forms the foundation for developing written language skills and literacy. Early reading emphasizes teaching attitudes and methods of reading that are both good and correct in terms of processes and outcomes (Hendry, 2020). In Elementary Schools, this early reading phase occurs in Phase A (grades 1 and 2) within the Merdeka curriculum, serving as a basis for acquiring subsequent skills in Phases B (grades 3 and 4) and C (grades 5 and 6) for advanced reading (Widyaningrum & Hasanudin, 2019).

The instructional design implemented incorporated a microlearning-based for presenting learning materials as an innovation in this research. Microlearning has been widely researched

as new strategy in e-learning, involving designing and delivering learning content in small, focused segments (Javorcik et al., 2023; Leong et al., 2021). This approach accommodates the characteristics of lectures in the Elementary School Teacher Undergraduate Study Program by using the e-learning management system. Extensive research has highlighted the advantages of microlearning in e-learning contexts (Díaz Redondo et al., 2021; Wang et al., 2020). Microlearning is intended to facilitate the collage student learning process regarding technical and practical early reading teaching materials, addressing the identified problem in this study through short, concise, and accessible learning content (Pham et al., 2024).

METHODS

This study combines quantitative and qualitative methods to test microlearning instructional design with process approach in improving pedagogical competence of prospective teachers in early reading teaching skills. The research subjects comprised collage students enrolled in the elementary teacher education study program within the faculty of education at Universitas Negeri Malang (UM), specifically those undertaking the Indonesian language learning in elementary school course in the semester of 2023/2024. Of all the research subjects, a single class comprising 40 collage students was selected with the treatment design outlined in Table 1 which is adjusted to the application of the process approach in the pre-reading, during-reading, and post-reading stages in its instructional design.

Data were collected through performance tests, field notes, and documentation. The performance test utilized a test instruction instrument and an assessment rubric designed specifically for evaluating collage students' skills in teaching early reading post-treatment. For the test, in this study utilized a one-group pretest and posttest design, incorporating microlearning-based instructional design as the treatment. The test results underwent analysis by calculating scores and percentages, with qualifications referenced from Table 2. This analysis was followed by the N-Gain test, with results interpreted as follows: $g > 0.7$ categorized as high; $0.3 \leq g \leq 0.7$ categorized as moderate; and $g < 0.3$ categorized as low.

Table 1. Treatment Scenarios

Pre-treatment	Pretest	Treatment	Posttest
Collage students have studied early reading learning materials in Elementary Schools independently and discussed it classically.	Collage students carry out a simulation of early reading learning using the Spelling method.	Specialized microlearning-based early reading instructional design. Exploration <ul style="list-style-type: none"> • Segment 1: An infographic is presented, providing a brief introduction to the concept and characteristics of early reading. • Segment 2: Handouts for Phase A of the Indonesian language curriculum are presented, enabling collage students to analyze the content related to teaching early reading. • Segment 3: A video explaining the early reading method is presented, allowing collage students to observe and apply the 	Collage students carry out a simulation of early reading learning using the Spelling method.

methodology.

- Segment 4: Examples of early reading learning designs utilizing a process approach (pre-, during-, and post- reading) are presented, encouraging collage students to study the content.
- Segment 5: A short video is presented, illustrating an example of teaching early reading utilizing a process approach (pre-, during-, and post- reading), and collage students are prompted to study the content.

Elaboration

- Segment 6: Instructions are presented for preparing a lesson plan and conducting a simulation of early reading learning utilizing a process approach (pre-, during-, and post- reading).
- Segment 7: Assessment instruments are presented, and collage students engage in peer teaching and peer assessment to evaluate the simulation processes and their outcomes.

Confirmation

- Segment 8: Slides presenting material discussing the simulation processes and their outcomes are shown, allowing collage students to reflect and receive feedback.
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Subsequently, field notes were employed to document collage students' skills during both the pretest and posttest stages. These notes were complemented by documentation to gather supporting data in the form of recordings and artifacts for the assessment of teaching early reading. Qualitative analysis of these observations was conducted through data display, reduction, and verification processes to refine and validate the research findings. The research procedure has four stages: planning, implementation, analysis, and reporting.

Table 2. Qualification of Collage Student Performance Test Results

Score	Qualification
>84	very good (numerical grade: A)
80-84	good (numerical grade: A-)
75-79	moderately good (fair) (numerical grade: B+)
70-74	bad (numerical grade: B)
<70	poor (numerical grade: <C+)

At the planning stage, instructional design was carried out using microlearning based on a process approach designed as a treatment in the research (Table 1). After that, instruments were prepared, starting from tests and rubrics for evaluating teaching performance, starting from appearance, mastery of content, teaching skills, and learning evaluation. Next, a field note sheet instrument was also prepared to enrich data acquisition and document checklist was used to ensure completeness.

The implementation of the research began by giving a pretest to collage students to simulate initial reading learning using peer teaching. After that, collage students explore, elaborate, and confirm to deepen their mastery of the material in teaching beginning reading presented in micro. After that, the post-test was conducted with a simulation of beginning reading learning using peer teaching again to compare the results. The entire process and results of beginning reading teaching skills are recorded and documented during this stage. At the analysis and reporting stage, data processing is carried out at this stage using the analysis technique. Processing begins with quantitative data analysis of test results using N-Gain, followed by qualitative data analysis from field notes and descriptive documentation to evaluate the improvement in early reading teaching of college students after the entire treatment. The results are reported in scientific publications as the primary research output.

RESULTS AND DISCUSSION

Specialized microlearning-based early reading instructional design, utilized as a treatment, was structured into eight segments, encompassing exploration, elaboration, and confirmation phases (see Table 1). In the presentation, a language process approach was implemented, divided into pre-, during-, and post- stages of teaching early reading. This approach differs from the initial conditions where collage students engage in independent exploration, and subsequent discussions were conducted in a classical manner. Following the designed scenarios, the treatment was implemented, and the pretest and posttest results were collected from collage student performance during the early reading learning simulation.

Teaching reading remains a prominent topic of discussion in the field of education in Indonesia, owing to numerous findings indicating low reading proficiency among collage students in the country. Reading, as a fundamental skill in literacy, plays a crucial role in the receptive acquisition of information during the processes of learning, communication, and interaction (Cordeiro et al., 2021). According to the study results, reading is defined as a highly complex cognitive process that involves the reception and processing of information through diverse cognitive mechanisms among individuals (García & Cain, 2014; Röthlisberger et al., 2023). This complexity underscores reading as an indicator or benchmark for assessing literacy skills, directly tied to collage students' cognitive levels. Consequently, the teaching of reading is intricately linked to understanding the processes and outcomes of reading.

Table 3. Pretest, Posttest and N-gain results

Process	Indicator	Descriptor	Score		N-gain	Category
			Pretest	Posttest		
Pre Reading	Reading attitude	Refers to the collage student's sitting position, body posture, direction, and angle of view towards reading materials, as well as gestures and readiness to read.	34	78	0.67	Moderate
	Directions for reading	Refers to the delivery of reading activities, including the selection of reading	54	80	0.57	Moderate

		materials and the intended purpose of reading.				
During Reading	Method Accuracy	Refers to the accuracy of the method employed in teaching early reading.	30	82	0.74	High
	Spelling Techniques	Refers to techniques for spelling syllables, words, and sentences, involving vowels, consonants, or a combination of both, to guide collage students during reading.	40	76	0.60	Moderate
	Media Use	Refers to the use of appropriate media in alignment with the reading learning method utilized.	52	86	0.71	High
	Teaching Fluency	Refers to fluency in teaching early reading, encompassing explanation, mastery of methods and media, and fostering interaction when reading with collage students.	44	76	0.57	Moderate
	Reading Guidance	Refers to the provision of reading assistance during classical, group, or individual learning sessions.	42	64	0.38	Moderate
Post Reading	Feedback Provision	Refers to providing feedback to enhance understanding of reading content and reinforce reading activities, including remedial measures and rewards.	36	82	0.72	High
Mean			41.5	78	0.62	Moderate

Following the pretest and posttest results, an assessment was conducted to measure improvement in collage students' skills utilizing the N-Gain test, and the details and outcomes are presented in Table 3. Based on the results of the N-gain test and analysis, it can be concluded that the instructional microteaching video product and teaching materials significantly influenced collage students' skills in early reading, as indicated by the assessment criteria. In the pretest, the results indicated that collage students' proficiency in early reading learning was initially low across the pre-, during-, and post- processes. The lowest performance was observed in the pre-reading process, with a majority of collage student groups (prospective Elementary School teachers) failing to guide their collage students in cultivating good reading attitudes. Reading attitude is a crucial aspect of reading learning achievement, particularly in elementary school Phase A. While reading directions were provided, they were limited to the title of the reading material to be covered.

From the implemented instructional design, it can be asserted that the specificity of the design aimed at teaching early reading, supported by microlearning, has a positive influence. The instructional design in this study is specifically based on microlearning, utilizing more targeted, focused, and concise learning segments for early reading teaching materials (Sung et al., 2023; Taylor & Hung, 2022). This choice aligns with the widespread use of microlearning as a strategy for developing content or materials in e-learning contexts (Criveanu et al., 2023; Prior Filipe et al., 2020). The materials encompass handouts, videos, presentation slides, images, articles, and references pertinent to the topic (Alias & Razak, 2024). Additionally, microlearning presentations are delivered in shorter durations, such as 1-3 minutes for learning videos, as employed in the treatment within this study.

In the reading process, the method accuracy indicator obtained the lowest score compared to other indicators. This indicates collage students' misconceptions in distinguishing between different early reading learning methods. As illustrated in Figure 1, the group of collage students utilized the SAS method. Additionally, other findings reveal instances where collage students employed the syllable method or global/sentence method, whereas the assigned learning simulations required the use of the Spelling method. Another challenge observed in the spelling techniques indicator was that prospective Elementary School teachers encountered difficulty and inaccuracies when spelling words ending in, or using combinations of, consonants. For instance, in the sentence "Kancil menolong Pak Tani", collage students were instructed to read the sentence and then spell the syllables as "ka-n-ci-l//me-no-lo-ng//pak//ta-ni" (CV-C-CV-C). In this example, it is evident that the syllable fragments were incorrectly spelled with a consonant (C) vowel (V) pattern: "kan-cil//me-no-long//pak//ta-ni" (Kancil (mousedeer) should be spelled: CVC).



Figure 1. Pretest Documentation of Early reading Learning Simulation

The use of media was confined to storybooks and simple sentences written on the board, which was not in harmony with the method used. Consequently, the size of the media was unsuitable for use in classical early reading learning due to being too small and containing an excessive amount of text. Regarding the teaching fluency indicator, collage students' challenges primarily stem from inaccuracies in methods, spelling techniques, and media utilization. This leads to a lack of smoothness or coherence in the early reading teaching process, especially during explanation and responses when reading. The reading guidance indicator were predominantly conducted classically, with collage student practitioners taking on the role of teachers, resulting in limited interaction and one-directional communication, where they instruct their elementary students to read together. Furthermore, in the post-

reading process, the majority of collage students (prospective Elementary School teachers) did not provide feedback.

In the posttest, the results indicated a notable improvement in students' skills in reading learning throughout the pre-, during-, and post- processes. During the pre-reading process, many student groups demonstrated examples of good reading attitudes. This included showcasing proper sitting positions and eye distances through demonstrations, pictures, and procedural explanations in songs. Reading directions were conveyed more effectively, such as explaining the early reading activities to be undertaken, including spelling patterns and rhythms. In the reading process, students correctly applied the early reading method, specifically the spelling method. Early reading learning commenced by introducing students to alphabet memorization, observing examples of words, and guiding students in composing and spelling syllables from combinations of consonants and vowels they had mastered. Although spelling techniques improved, it was noted that two student groups still faced challenges when guiding reading with consonant combinations such as "ny" and "kh".



Figure 2. Posttest Documentation of Early reading Learning Simulation

The use of media has started to diversify, aligning with the assigned Spelling method. Some students incorporate pictures, puzzles, or large books to avoid directly reading text or sentences. An example of the use of media is shown in one of the groups illustrate in Figure 9. In this posttest, students demonstrated increased fluency in teaching early reading, showing readiness to master the method and accuracy in utilizing media. Despite improvements in the teaching fluency indicator, students still faced challenges, primarily related to method accuracy, spelling techniques, and the use of media. These challenges impacted the smoothness or coherence in the early reading teaching process, especially during explanation and responses when reading. Reading guidance was conducted both classically and individually, with limited interaction. For instance, after reading together, the teacher assigned several students to read. Finally, after reading, feedback was provided by reviewing the reading activities conducted by students and posing questions about the content of the text read, which were then answered through discussion.

The main difference in learning that has been implemented with the treatment also lies in the emphasis on the process approach in teaching early reading. Before the pretest, students had received an explanation of the materials regarding early reading concepts, but the results of the simulation practice showed that the criteria for low student ability results were obtained. Students did not master the skills in preparing (pre-reading), guiding students to learn to read (during-reading), and providing reinforcement for the outcomes (post-reading).

Collage students only taught reading directly without a process that refers to mastering the correct reading process, which should be the main basis taught for early reading (Stutchbury et al., 2020; Wagner & Lonigan, 2023).

After the treatment was given, a comparison was obtained between the posttest results and the results of collage students' skills, which had increased significantly. The assessment indicators used refer to the process and characteristics of early reading learning, which consist of reading attitudes, spelling techniques, mastery of methods and media, as well as guidance to facilitate collage student reading learning (Amendum & Liebfreund, 2019; van den Bosch et al., 2019). These indicators are then aligned with the pre-, during-, and post-reading stages, remembering that reading is not only an outcome but also involves a process. The use of media, teaching fluency, and reading guidance are indicators in teaching early reading (Lee et al., 2024). These indicators are used in the assessment for reading, while in pre-reading, the beginning leads to preparing collage students for attitudes and reading direction, and in post-reading, the beginning is carried out to provide reinforcement of the processes and outcomes (Ardhian et al., 2020).

The results of the treatment show that for prospective Elementary School teachers, mastery of early reading teaching includes mastery of the content and teaching methods (Flynn et al., 2021). This is in line with the results of the pretest, one of which shows the inaccuracy of the spelling teaching methods utilized in early reading learning. In the posttest results, this skill increased, especially in the utilization of appropriate early reading teaching methods and media, while other indicators such as attitude and direction, fluency and guidance, as well as reading reinforcement were still in the moderately improved category (Cattoni et al., 2024; Pazeto et al., 2020; Rini, 2018). As discussed previously, teaching early reading is very technical and practical, so mastering it requires more practice and experience (Dolean et al., 2021; Drake & Wash, 2020). Therefore, referring to the results of this study, it is recommended to provide more space for collage students to learn in a directed and focused manner.

CONCLUSION

The study shows that microlearning-based instructional design can significantly improve the early reading teaching skills of prospective elementary school teachers. The results show that a specialized design can guide students through the exploration, elaboration, and confirmation phases of early reading learning. Assessments during the pre-reading stage, during-reading stage, and post-reading stage show noticeable improvement in skills. However, teaching fluency and guidance remain areas that need further enhancement. The study recommends more teaching practice, wider-scale experiments, in-depth case studies, and the development of methods and media to address these gaps.

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