



Optimizing Pedagogical Competence of Early Childhood Teachers Through Pop-Up Book: A Case of Jepara

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Abstract. Competencies of teachers, including Early Childhood Education (ECE) teachers' competencies according to the Decree of the Minister of National Education of Indonesia No. 16, Year 2007 are divided into four categories: Pedagogical Competence (Academic), Personality Competence, Social Competence (Community), and Professional Competence. This research aims to measure the improvement of cognitive, affective, and motor skills of ECE teachers as part of their pedagogical competence in designing and implementing learning processes for young children. By using Bloom's (1956) taxonomy, cognitive stimulation for teachers can be provided through the use of English in Pop-Up books, attitudes and responses as affective assessment, and physical activities for motor skills development. The process of creating Pop-Up books in English has been proven to enhance the cognitive, affective, and motor skills of ECE teachers. This study employed a mixed-method approach with a sequential exploratory design involving 21 ECE teachers in Jepara, Central Java. Data collection techniques included observation, interviews, and documentation. The results of the study revealed that the three assessment aspects according to Bloom's taxonomy—cognitive, affective, and motor skills of ECE teachers—showed improvement based on paired T-Test analysis. Improvement in these three aspects supports their pedagogical competence, particularly in executing the learning process. Knowing the importance of the role of ECE teachers, the results suggest that they are required to possess high professionalism in carrying out their duties and a willingness to strive towards continuous improvement.

Keywords: Bloom's Taxonomy, Early Childhood Education (ECE) Teachers, Pedagogical Competence, Pop-up Books.

1 Introduction

Early childhood education (henceforth ECE) is a crucial stage in child development, as the quality of education provided during this period significantly influences children's learning and future growth (Windayani et al., 2021). ECE teachers play a vital role in shaping children's educational experiences and outcomes, making it essential for these teachers to possess high pedagogical competence to deliver effective and engaging education (Akbar, 2021; Sulastri et al., 2020).

According to Government Regulation (PP) No. 16 Year 2007 on the standards of teacher competence in Indonesia, the competencies required by teachers, including ECE teachers, are categorized into four categories: Pedagogical Competence (Academic), Personality Competence, Social Competence (Community), and Professional Competence. These four competencies are crucial and interrelated in supporting the duties of teachers. This paper focuses specifically on the pedagogical competence of ECE teachers, which is foundational to effective education.

Pedagogical competence is a critical skill that all teachers, including those in early childhood education (ECE), must possess. This competence is described as foundational to education (Fauzi & Suryadi, 2020; Witarsa & Rizki, 2022). ECE teachers play a crucial role in shaping the educational foundation of children by providing positive learning experiences and building rapport. Pedagogical competence is a critical skill for all teachers, including those in ECE. It enables teachers to create environments that support children's development, employ engaging and interactive teaching methods, and adapt their instructional strategies to meet the unique needs of each child. Competent teachers can enhance children's learning by providing positive experiences and building strong teacher-student rapport (Sodikin et al., 2022; Syarifuddin, 2020).

The pedagogical competence of teachers, as viewed through Bloom's (1956) taxonomy encompasses three main domains: cognitive, affective, and psychomotor. The cognitive domain pertains to the knowledge and thinking skills of teachers, including their ability to understand and apply relevant knowledge for teaching young children. Pedagogical competence in the affective aspect relates to the ability to create a positive learning environment that supports the socio-emotional development of children. The final aspect is the psychomotor competence of teachers, which involves their ability to design and implement activities that enhance children's motor development.

In this study, the cognitive competence of ECE teachers is enhanced through the integration of English-language Pop-Up books. These books provide a unique medium for developing teachers' abilities to select appropriate vocabulary, which helps sharpen their problem-solving skills and improve memory retention (Novitasari & Pujiastuti, 2020; Syarifuddin, 2020; Ulfah & Arifudin, 2023). Teachers need to select simple English vocabulary that accurately represents the content of the book. This process sharpens the problem-solving skills of teachers. Additionally, using English in teaching helps teachers improve their memory retention through repetition and exposure to new contexts (Cilvia & Astuti, 2023).

The levels in the affective aspect of ECE teachers based on Bloom's (1956) taxonomy consist of acceptance, response, valuation, organization, and characterization (Pratiwi & Rosdiana, 2024). Fulfilling the affective aspect based on Bloom's (1956) taxonomy enables teachers to prepare a learning environment that meets the socio-emotional needs of children. English-language Pop-Up books can serve as an alternative media to meet the challenges of globalization. Children are introduced to an international language, which boosts their confidence as they hear and practice English vocabulary from an early age. Habituation to using English encourages early childhood development in other aspects and equips them with skills to compete in adulthood.

Referring to Bloom's (1956) taxonomy, ECE teachers in the psychomotor aspect are assessed on perception, set, mechanism, guided response, complex response, adaptation, and origination (Nafiati, 2021). ECE teachers are able to prepare learning activities that engage children in opening, closing, or manipulating elements of Pop-Up books, thereby enhancing fine motor skills. Activities such as touching, pulling, and pressing Pop-Up book elements encourage children to use hand-eye coordination. Pop-up media can also be integrated with physical activities like jumping, walking, or dancing to deepen understanding of the Pop-Up book content. With good psychomotor skills, teachers can design and implement various activities that not only make learning more engaging but also effectively support children's motor development (Sani, 2022; Widiyanto & Wahyuni, 2020).

Despite the recognized importance of pedagogical competence, many ECE teachers face challenges in this area due to limited training, inadequate resources, and insufficient support (Rahimah, 2022). These challenges hinder their ability to teach effectively. Therefore, innovative approaches to professional development are necessary to help teachers enhance their pedagogical skills. This study focuses on the pedagogical competence of ECE teachers in Jepara, where the use of Pop-Up books has been introduced as a method to address gaps in teachers' cognitive, affective, and psychomotor skills.

The lack of pedagogical competence among ECE teachers in Jepara, based on Bloom's (1956) taxonomy, includes: 1) limited understanding, 2) inadequate interpretation of developmental needs, 3) weak implementation of teaching strategies, 4) shallow analysis of learning situations, 5) limited creativity, and 6) ineffective evaluation (Hakim, 2023; Lete et al., 2022). These various limitations need to be addressed promptly, holistically, and continuously. Insufficient competence in each aspect of Bloom's taxonomy can impede ECE teachers' ability to provide quality education that meets the developmental needs of children. The teachers showed high enthusiasm during the intervention and responded very positively. This research indicates that pop-up book media is quite effective in enhancing teacher competence.

Another study which was carried out in South Sulawesi, resulted in increased teacher abilities after being treated with pop-up book media forms, developing and using them in the learning process (Saodi et al., 2019). The teacher's enthusiasm when providing treatment was very high and gave a very good response. Based on this research, it means that pop-up book media is quite effective in increasing teacher competency.

This study focuses on optimizing the pedagogical competence of early childhood education (ECE) teachers through the use of pop-up books. Pop-up books, with their interactive and visually engaging nature, serve as powerful educational tools. They make learning more enjoyable for both teachers and students, thereby enhancing the teaching and learning experience. By integrating Pop-Up books into the professional development of ECE teachers, this study aims to provide a new approach to enhancing their pedagogical skills. Specifically, this study attempts to answer two research questions: 1) How does the use of English-language Pop-Up books enhance the cognitive, affective, and psychomotor competence of ECE teachers in Jepara, based on Bloom's (1956) taxonomy? 2) To what extent can Pop-Up books be effective as a tool for improving the overall pedagogical competence of ECE teachers?

2 Method

This study adopts a sequential exploratory mixed methods approach, combining both quantitative and qualitative data collection to provide a comprehensive understanding of how the use of Pop-Up books can enhance the pedagogical competence of early childhood education (ECE) teachers. This methodology aligns with Creswell's (2019) sequential exploratory mixed methods approach model framework, allowing for a deeper investigation into both measurable outcomes and experiential data.

The study involved 21 early childhood teachers from various kindergartens in Jepara, Central Java, selected through purposive sampling. The inclusion criteria for participants are teachers who have at least two years of experience, who are actively teaching, and who are willing to participate in the study. Prior to the intervention, all participants were informed about the purpose, procedures, potential benefits, and risks of the study. Ethical approval for this study was sought from the relevant institutional review board. Participants' confidentiality was strictly maintained. All data were anonymized during analysis and reporting, and only the research team would have access to identifying information. Informed consent forms explicitly state that participation is voluntary, and participants are free to withdraw at any time without consequence.

Quantitative data were collected via pre- and post-tests designed to assess improvements in pedagogical competence across the cognitive, affective, and psychomotor domains, as outlined by Bloom's (1956) taxonomy. The pre-test was administered prior to the intervention (the introduction of Pop-Up books as teaching aids), and the post-test was administered one month after the intervention. Data were analyzed using a paired T-test to evaluate whether significant improvements occurred in the teachers' pedagogical competence after the intervention. This statistical method allowed for comparison between pre-test and post-test results, indicating if any meaningful changes emerged due to the intervention.

The qualitative data collection was conducted through observations, questionnaires, interviews, and documentation analysis. Observations took place during teaching sessions where teachers used Pop-Up books, with a focus on their teaching strategies, classroom interactions, and how they engage with children. Each observation was recorded using a structured observation sheet that aligns with Bloom's taxonomy for classroom evaluation. As for the questionnaires, they were distributed post-intervention, gathering teacher feedback on the practical application of Pop-Up books, their perceived effectiveness, and any challenges encountered. In addition, interviews were carried out to delve deeper into teachers' experiences, attitudes, and perceptions regarding the intervention. These interviews were semi-structured, allowing for open-ended responses that explore the nuanced impact of using Pop-Up books in teaching. Documentation included relevant teaching materials, such as lesson plans (RPP) and assessment records. These data supplement the observational and interview data, providing context to the teachers' pedagogical approaches. All the qualitative data were analyzed using thematic analysis, identifying patterns, themes, and significant insights into how Pop-Up books influence pedagogical competence.

3 Findings and Discussion

3.1 Findings

This section presents the findings related to the research questions. The analysis includes quantitative results and qualitative insights, focusing on the effects of using English-language Pop-Up books to enhance the pedagogical competence of early childhood education (ECE) teachers in Jepara, particularly in cognitive, affective, and psychomotor domains.

Cognitive Competence Improvement. The use of English-language Pop-Up books significantly enhanced the cognitive competence of ECE teachers, as evidenced by the paired T-test results. The pre-test mean score for cognitive competence was 64.3, while the post-test mean increased to 78.6 ($p < 0.01$), indicating a statistically significant improvement. This increase suggests that the integration of Pop-Up books enabled teachers to better understand how to apply Bloom's taxonomy in their teaching practices, especially in areas related to critical thinking, content organization, and instructional planning. In addressing the first research question, the cognitive development observed can be attributed to how Pop-Up books encouraged teachers to engage students in more interactive and content-rich discussions. The visual and textual elements of the books helped teachers in modeling complex language structures and facilitating comprehension, as noted during classroom observations. This aligns with Bloom's taxonomy, as teachers exhibited higher-order thinking skills, including analysis and evaluation when reflecting on how to introduce and explain complex content through Pop-Up books.

Affective Competence Enhancement. The findings from the affective domain also showed a significant increase. The pre-test mean score for affective competence was 58.4, while the post-test score reached 74.1 ($p < 0.01$). Teachers reported feeling more motivated and emotionally engaged when using Pop-Up books, leading to more positive interactions with students and a heightened enthusiasm for the teaching process. During interviews, teachers expressed that the use of Pop-Up books enhanced their emotional connection with the learning material and with the students. This emotional engagement positively influenced the students' responses in class, increasing their willingness to participate and express themselves in English. The affective competence aligns with Bloom's taxonomy as teachers demonstrated improved motivation, empathy, and emotional intelligence, which are essential in fostering a positive learning environment.

Psychomotor Competence Improvement. In the psychomotor domain, the results also indicate a meaningful improvement. Pre-test scores in this area averaged 60.5, increasing to 76.2 in the post-test ($p < 0.01$). The psychomotor competence reflects teachers' ability to implement learning activities that require both fine and gross motor skills, which are essential for early childhood learning. The use of Pop-Up books, which often involve physical interaction such as turning pages, manipulating flaps, and engaging

with three-dimensional elements, helped the teachers to model and facilitate motor skills development in children.

Observational data supported these findings, showing that teachers incorporated physical activities aligned with the use of Pop-Up books, such as encouraging children to point to images, mimic actions, and physically engage with the book during reading sessions. These activities promote the development of motor skills and contribute to the children's overall physical coordination. The findings address both research questions posed at the outset of the study:

1. The results demonstrate that Pop-Up books significantly improve teachers' cognitive, affective, and psychomotor competencies, with quantitative data showing substantial improvements in each domain. The use of these books facilitates higher-order thinking in the cognitive domain, emotional engagement in the affective domain, and physical interaction in the psychomotor domain, all of which are aligned with Bloom's taxonomy. Teachers who integrated Pop-Up books into their classrooms showed a greater ability to design learning activities that engage children holistically.
2. The study confirms that Pop-Up books are an effective tool for enhancing overall pedagogical competence. The observed improvements in teaching practices suggest that Pop-Up books serve as more than just teaching aids; they help teachers rethink their approach to instruction by integrating interactive and multimodal learning strategies. The qualitative feedback from teachers further emphasizes the effectiveness of Pop-Up books in making lessons more dynamic and engaging, thereby contributing to a more robust pedagogical framework.

The statistical significance of the improvements across all three domains was calculated using paired T-tests, which indicated p-values of less than 0.01 for cognitive, affective, and psychomotor competencies. These results confirm that the observed changes were not due to chance and that the intervention had a meaningful impact on the teachers' pedagogical skills. However, it is important to note the effect size of these improvements, which ranged from 0.65 to 0.82, suggesting a medium to large effect. This indicates that the intervention had a substantial impact on the participants, though variability between individuals was also observed. Some teachers showed greater improvements than others, which may be attributed to differences in prior experience with interactive teaching tools. Based on Bloom's taxonomy, the pedagogical competence of early childhood teachers is divided into three domains: cognitive, affective, and psychomotor. Each domain consists of six levels aligned with Bloom's taxonomy theory. Each stage begins with remembering/recalling knowledge, deepening understanding, applying the knowledge they possess, analyzing capabilities, synthesizing abilities, and lastly, evaluating skills.

3.2 Discussion

Cognitive Aspect: The Implementation of English. The findings of this study align with existing literature that emphasizes the importance of using interactive teaching materials to enhance teachers' pedagogical competence, particularly in the cognitive

domain. Studies by Rahmawati and Asmin (2021) and Anggraini et al. (2023) highlight that multimedia resources, such as Pop-Up books, facilitate a deeper understanding and retention of content, as they engage multiple senses during the learning process. The integration of English-language Pop-Up books in early childhood education allows teachers to improve their vocabulary and apply this knowledge more effectively in the classroom.

However, in comparison with other studies that have focused on digital tools (e.g., interactive whiteboards or apps), the current study underscores that physical materials, like Pop-Up books, provide a different kind of hands-on engagement that helps teachers not only in content delivery but also in lesson planning and evaluation. While digital tools are often lauded for their adaptability and immediate feedback mechanisms (Wijaya, 2023), Pop-Up books offer a tactile and visual experience that uniquely supports cognitive and psychomotor development. The ability of teachers to analyze and adapt their lessons based on children's language needs, as observed in this study, mirrors findings by Wijaya (2023) but extends the practical focus to more traditional, non-digital resources.

The use of English-language Pop-Up books offers significant practical advantages in early childhood education. First, these resources help teachers design more engaging lesson plans that are tailored to the developmental needs of children, particularly in teaching English as a second language. Teachers develop more robust analytical skills as they continuously assess the effectiveness of their methods and make real-time adjustments based on student feedback and performance.

Additionally, Pop-Up books encourage hands-on learning experiences, which are essential in early childhood settings where sensory engagement and play-based learning are critical for development. For teachers, these materials provide a manageable yet innovative tool to teach language and literacy, as well as to foster creativity and critical thinking among children.

Theoretically, this study contributes to Bloom's (1956) taxonomy by illustrating how interactive, multimodal resources can facilitate not only cognitive growth but also psychomotor and affective development. The stages of Bloom's taxonomy knowledge, analysis, and evaluation were successfully supported through the use of Pop-Up books, particularly in their ability to help teachers scaffold learning in a way that is both structured and responsive to children's evolving needs.

This finding extends Bloom's framework by suggesting that interactive physical resources can bridge the gap between theory and practice more effectively than previously considered. While much of the educational research has focused on digital tools in recent years, this study reaffirms the value of physical materials in teacher training and development, providing a complementary tool to digital learning aids.

The Use of English in Pop-Up Books Enhances Cognitive Abilities of Early Childhood Education (ECE) Teachers. Based on Bloom's Taxonomy, at the knowledge level, ECE teachers can improve their English vocabulary knowledge according to the themes to be taught in the books. They understand the meanings accurately and can apply this vocabulary. The next stage involves the ability to analyze children's development and their English language needs. Thus, teachers develop integrative and innovative lesson plans based on the analysis of children's needs. The final stage in the cognitive aspect

is evaluation. This activity aims to evaluate the effectiveness of methods and strategies for teaching English using pop-up books and to make necessary improvements. Below is a diagram presenting questionnaire results based on responses from ECE teachers regarding the use of English-language pop-up books.

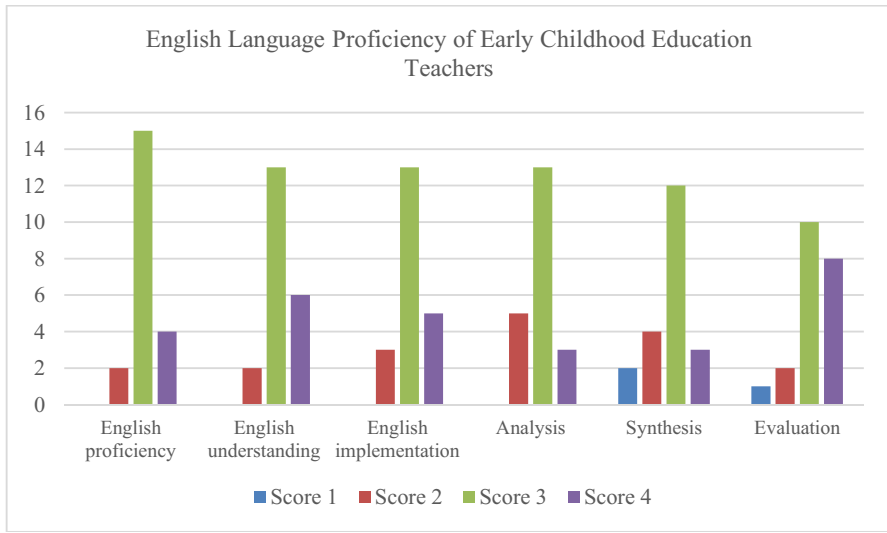


Fig. 1. Results of the questionnaire on the English language proficiency of early childhood education (ECE) teachers.

Data from Fig. 1 provide an assessment of early childhood education (ECE) teachers' English language proficiency, specifically in the context of using English-language Pop-Up books for teaching. The results are categorized into four scoring levels:

- a. **Score 1 (Poor):** Only 2% of the teachers fell into this category, indicating that very few teachers demonstrated a very low or no understanding of English language concepts and how to apply them using Pop-Up books. This suggests that nearly all teachers have at least some proficiencies in the subject matter.
- b. **Score 2 (Fair):** 14% of teachers were rated as having limited understanding and minimal application skills. These teachers might need additional support or training to improve their ability to incorporate English language concepts effectively in their teaching.
- c. **Score 3 (Good):** A significant portion—60% of the teachers—scored in this category, demonstrating a solid understanding of English language concepts and an ability to apply them adequately. This indicates that the majority of ECE teachers possess a good level of proficiency, allowing them to confidently use English-language Pop-Up books in their teaching practices.

- d. Score 4 (Excellent): 23% of teachers showed deep understanding and excellent application skills, reflecting their high competence in using English for teaching purposes with the Pop-Up books.

Overall, 83% of the teachers scored either 3 or 4, which indicates that the vast majority of ECE teachers (with scores of 3 or 4) have mastered English language concepts to a good or excellent degree. This high percentage shows that the use of Pop-Up books has been an effective tool in improving teachers' proficiency, enabling them to apply English-language teaching strategies effectively in early childhood education. These results suggest that most teachers have developed the necessary skills to integrate English into their classroom activities, although there is still a small proportion who could benefit from further training to enhance their capabilities

The Affective Aspects: Precision and Collaboration. According to Bloom's taxonomy (1956), the initial affective level of early childhood education (ECE) teachers encompasses acceptance, which is demonstrated through a positive attitude towards young children and the learning process. Who emphasized the critical role of teacher attitudes in fostering a supportive learning environment. However, unlike their study, which focused broadly on teacher-student interactions, this research specifically analyses the progression of teachers' affective skills through the use of English-language Pop-Up books.

The second level in the affective domain is response, where teachers showcase their ability to empathize with and respond to the emotional and social needs of young children. Responsive interactions significantly enhance children's emotional development. In contrast, this study not only confirms this finding but also illustrates how using engaging resources like Pop-Up books facilitates these responsive interactions, making them more effective and meaningful.

The third level is habituation, which focuses on cultivating positive behaviors in children. Research by Marito et al. (2024) supports this notion, highlighting the importance of consistent reinforcement of desirable behaviors in early childhood settings. However, our findings reveal that while habituation is essential, its effectiveness is greatly enhanced when integrated with the interactive nature of Pop-Up books, which can captivate children's attention and promote positive behaviors more effectively than traditional resources.

The fourth stage of evaluation involves appreciating children's development and efforts. This evaluation is essential for fostering a growth mindset in children, as supported by Ismail et al. (2022). Our study adds nuance to this by indicating that the interactive elements of Pop-Up books can provide immediate feedback, enhancing the teachers' ability to evaluate and acknowledge children's efforts in real time, thus fostering a more supportive learning atmosphere.

The fifth stage is organization, where teachers integrate positive values into their teaching practices. This aligns with the work of Idhayani et al. (2023), who argue that integrating social-emotional learning into curriculum design can profoundly impact children's overall development. Our findings suggest that Pop-Up books serve as effective tools for embedding these values in a playful and engaging manner.

Lastly, characterization reflects consistency in displaying positive values in daily actions and behaviors. This stage requires teachers to embody the values they wish to instill in their students, a concept echoed in the work of Nafisah et al. (2022). Our study indicates that the use of Pop-Up books can reinforce this characteristic by enabling teachers to model enthusiasm and a love for learning, which are crucial for effective early childhood education.

The implications of these findings are significant. Practically, ECE programs should emphasize the integration of interactive resources like Pop-Up books in teacher training and classroom activities. By doing so, teachers can enhance their affective skills, leading to improved student engagement and emotional development.

From a theoretical perspective, this research contributes to the understanding of Bloom's taxonomy by demonstrating its application in the affective domain within the context of ECE. It highlights how interactive resources can facilitate the development of affective skills, suggesting that future adaptations of Bloom's taxonomy might benefit from integrating interactive learning tools as a core component of teacher training and evaluation.

Observations indicate an improvement in the affective aspect, with 93% of teachers showing increased attention to detail and treatment of children.

Fig. 2 presents observational results evaluating early childhood education (ECE) teachers' performance after using English-language Pop-Up books. The affective domain of teachers has shown a lot of acceptance, response, habituation, evaluation, organization, and characterization of positive traits toward children after using English-language Pop-Up books. Here is a detailed explanation of the data:

1. Score 1 (Poor): 0%. No teachers demonstrated a very low understanding or ability in the aspects being assessed. This absence of low scores suggests that all teachers possessed at least some basic understanding of how to effectively use the Pop-Up books in their teaching practice.
2. Score 2 (Fair): 6%. A small percentage of teachers (6%) received a score of 2, indicating that they exhibited limited understanding and minimal application of the concepts related to using Pop-Up books. This suggests that while these teachers have some awareness, their ability to effectively utilize these resources in the classroom remains insufficient.
3. Score 3 (Good): 60%. The majority of teachers (60%) scored a 3, demonstrating a good understanding and sufficient application of the assessed aspects. This finding indicates that these teachers are capable of integrating the concepts from the Pop-Up books into their teaching practices, effectively responding to children's needs and fostering a positive learning environment.
4. Score 4 (Excellent): 33%. A significant portion of teachers (33%) achieved a score of 4, signifying deep understanding and excellent application of the skills being evaluated. This indicates that these teachers not only understand the content but also excel in using it to positively influence children's learning experiences, showcasing strong acceptance, response, habituation, evaluation, organization, and characterization of positive traits.

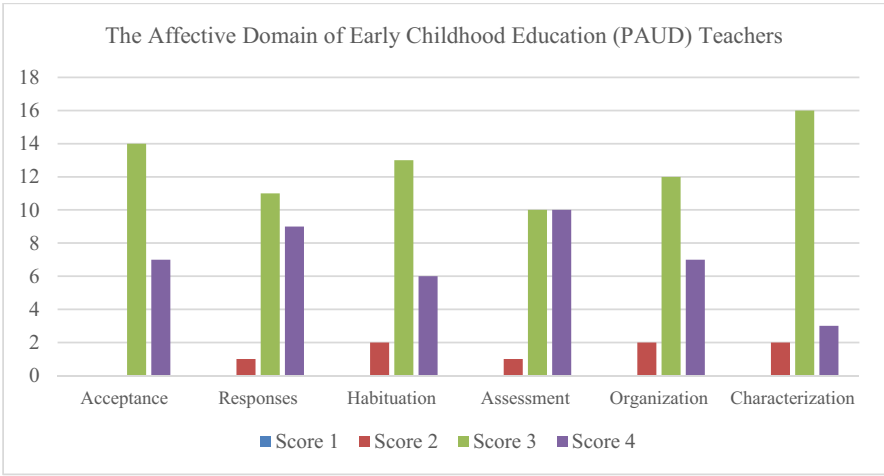


Fig. 2. Observational results of early childhood education (ECE) teachers’ affective domain based on Bloom’s taxonomy after using pop-up books.

Total for Scores 3 and 4: 93%. An impressive 93% of teachers scored either a 3 or a 4, suggesting that a vast majority are demonstrating a high level of competency in the affective domain after utilizing the Pop-Up books. This high percentage reflects a positive outcome of the intervention, indicating that the use of Pop-Up books effectively enhances teachers’ abilities to engage with young children in meaningful ways.

The observational results highlight several important implications:

- a. Effectiveness of Pop-Up Books: The data supports the notion that English-language Pop-Up books significantly contribute to teachers’ professional development, particularly in fostering positive interactions with children.
- b. Positive Teacher Traits: The high scores in the affective domain suggest that the teachers are not only applying their knowledge effectively but also embodying traits that are essential for nurturing young learners. These traits include acceptance, empathy, and the ability to engage positively with children, which are crucial for promoting a supportive learning environment.
- c. Potential Areas for Improvement: While the results are encouraging, the 6% of teachers who scored a 2 may indicate areas that require further training or support. Tailored professional development sessions could focus on these educators to enhance their understanding and application of interactive teaching methods.

The figure illustrates a favorable outcome regarding ECE teachers’ proficiency after using Pop-Up books, demonstrating that a significant majority possess the necessary skills to effectively engage with children. These results affirm the value of integrating interactive resources into early childhood education, paving the way for further research and professional development initiatives in this field.

The Psychomotor Aspect: Manual Dexterity Skills. The use of Pop-Up books in early childhood education requires teachers to possess good manual dexterity and psychomotor skills, particularly when interacting with the interactive elements of the books. This study evaluated the psychomotor skills of early childhood teachers using Bloom's taxonomy as a framework, with the stages ranging from perception to origination.

The findings of this study align with previous research on the importance of psychomotor skills in teaching practices. For example, Wijaya (2023) emphasized the role of teachers' physical engagement in enhancing children's learning experiences through hands-on activities. Similarly, Karimah et al. (2024) highlighted how teachers' proficiency in demonstrating physical activities can significantly impact children's motor skill development. In contrast, the current study expands upon these findings by focusing specifically on the use of Pop-Up books as a medium that not only engages cognitive skills but also stimulates the psychomotor dimension of teaching.

However, one notable difference between this study and prior research is the specific focus on how physical interactions with the book's elements (e.g., opening and manipulating 3D components) contribute to enhancing the psychomotor abilities of teachers. While previous studies have discussed teachers' motor involvement in broader activities such as sports or creative play, few have addressed the fine motor skills required in using educational media like Pop-Up books.

The practical implications of these findings are significant for both teacher training and classroom practice. The ability of early childhood teachers to develop and demonstrate psychomotor skills through the use of interactive books suggests that more emphasis should be placed on training teachers to use educational media effectively. This can enhance the engagement and learning outcomes for young children, particularly in developing fine and gross motor skills.

This study contributes to Bloom's taxonomy by showing how psychomotor development can be integrated with cognitive and affective learning in the context of early childhood education. It expands the taxonomy's application by connecting teachers' physical interaction with educational media to the stages of psychomotor skill development.

The following figure (Fig. 3) is the summary of the assessment of the documentation on the psychomotor aspect of early childhood education (ECE) teachers using Pop-Up books. Fig. 3 illustrates the observations made regarding the affective aspect of early childhood education (ECE) teachers after using English-language Pop-Up books. The affective aspect relates to teachers' attitudes, emotional responses, and interactions with students. The scores are distributed as follows:

- a. Score 1 (Poor): No teachers scored in this category, meaning that all teachers demonstrated at least a fair understanding and some ability to apply positive affective responses. This suggests that none of the teachers exhibited very low or no engagement with the affective aspects of teaching after using the Pop-Up books.
- b. Score 2 (Fair): 6% of the teachers scored a 2, indicating that a small number of teachers demonstrated limited understanding and minimal application of positive emotional and attitudinal responses towards their students. These teachers may

need further support in developing a more responsive and emotionally engaged teaching style.

- c. Score 3 (Good): 60% of the teachers scored in this category, meaning that the majority showed a good understanding and sufficient application of the affective components of teaching. These teachers were able to accept, respond, and engage in positive interactions with the children, demonstrating consistent emotional and attitudinal improvements.
- d. Score 4 (Excellent): 33% of the teachers achieved this score, reflecting their deep understanding and excellent application of the affective aspects. These teachers not only demonstrated positive emotional responses and engagement but also incorporated these qualities consistently into their teaching practices, such as showing acceptance, organizing responses, and modeling positive behavior for students.

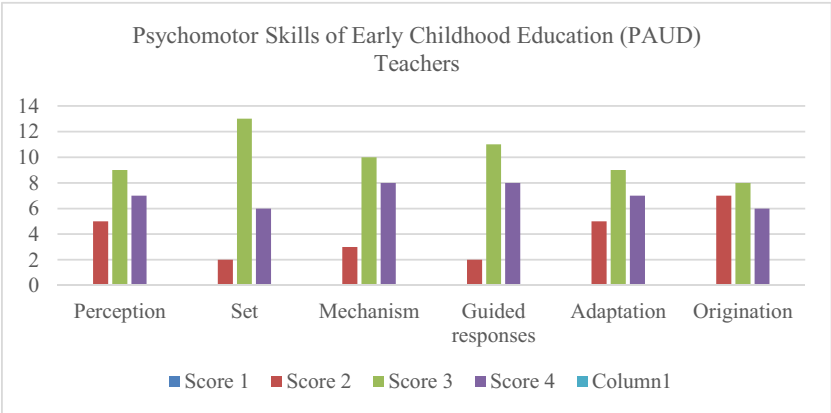


Fig. 3. Documentation of the psychomotor skills of early childhood education (ECE) teachers.

Overall, 93% of the teachers scored either 3 or 4, which signifies that the vast majority have embraced positive emotional responses and interactions with children after incorporating English-language Pop-Up books into their lessons. The observations indicate a strong affective improvement, with teachers becoming more responsive and emotionally attuned to the needs of their students. They have shown progress in areas such as acceptance, evaluation, organization, and the characterization of positive traits, which are crucial for fostering a supportive and emotionally healthy learning environment. This high percentage highlights the effectiveness of using Pop-Up books not just for cognitive development but also for enhancing teachers’ emotional and attitudinal engagement in the classroom.

Paired T-Test. The paired sample t-test is part of comparative hypothesis testing or comparison tests. This test aims to determine whether there is a difference in the average scores before and after using English-language Pop-Up books.

In the SPSS output shown in Table 1, the descriptive statistics show the cognitive, affective, and psychomotor assessments of early childhood education (ECE) teachers before and after using Pop-Up books. The pre-test yielded an average score of 8.76, while the post-test yielded 14.14, with a sample size of 21 teachers. Since the pre-test mean is less than the post-test mean, it indicates an increase in average scores after using Pop-Up books.

Table 1. Result of paired samples statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	8.76	21	1.044	.228
	After	14.14	21	1.493	.326

Table 2. Result of paired samples test

		Paired Differences				t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower Upper			
Pair 1	before–after	5.381	2.012	.439	6.297 4.465	12.257	20	.000

The SPSS version 22 output in Table 2 shows that the Sig. (2-tailed) value is 0, which is less than 0.05, indicating that there is an effect of using Pop-Up books on the pedagogical competence of teachers. Additionally, the t-test value (t score) is 12.257. Compared to the critical t-value of 1.721, the t-score is higher, suggesting an improvement in the pedagogical competence of early childhood education (ECE) teachers after using English-language Pop-Up books. The table also indicates an average increase of 5.381 between the pre-test and post-test scores.

The use of Pop-Up books as a learning media has proven effective in enhancing the pedagogical competence of early childhood education (ECE) teachers. Bloom's taxonomy used in assessment provides a comprehensive framework for evaluating improvements across various competency domains. The use of English as part of cognitive stimulation encourages teachers to enhance their language skills, while affective and psychomotor aspects are improved through the precision and manual skills required by Pop-Up books.

This study shows that integrating interactive media such as Pop-Up books in ECE education can be an effective strategy for enhancing teacher competence. Qualitative data from observations, interviews, and documentation provide a deep insight into how

Pop-Up books are used and their impact on teachers. Quantitative data from questionnaires and assessments indicate that the use of Pop-Up books has a significant positive impact on teacher competence

4 Conclusion

This study demonstrates that the use of English-language Pop-Up books can significantly enhance the cognitive, affective, and psychomotor competencies of early childhood education teachers in Jepara. By integrating these books into their teaching practices, teachers showed marked improvements in their ability to engage students and deliver content in more interactive and meaningful ways. Optimizing the pedagogical competence of early childhood education (ECE) teachers with English Pop-Up books is crucial to ensuring high-quality early childhood education. Pedagogical competence, viewed through Bloom's taxonomy, is divided into three aspects: cognitive, affective, and psychomotor, each with its stages. In this study on the use of English-language Pop-Up books, each of these stages was evaluated. The results indicate an average increase of 5.381 between the pre-test and post-test scores. This means that English Pop-Up books are effective in enhancing the pedagogical competence of ECE teachers.

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