Ceria: Jurnal Program Studi Pendidikan Anak Usia Dini
Volume 15, Number 3, 2026 pages 1891-1915
P-ISSN: 2301-9905 E-ISSN: 2775-409X
Open Access: https://jurnal.umt.ac.id/index.php/ceria/index

Little Chef: My Snack Project Improves Number Concept Recognition Skills in Children Aged 4–5 Years

Asti Rahmayanti[1], Wahju Dyah Laksmi Wardhani[2], Indah Yuli Winarni [3]
[1,2,3] Universitas Muhammadiyah Jember, Jember, Indonesia
e-mail: *[1]astirahmayanti1806@gmail.com ,
[2]dyahlaksmi_paud@unmuhjember.co.id,
[3]indahyuliwinarni@gmail.com

ARTICLE INFO

Article history:
Received: July 31, 2026
Accepted: October 7, 2026
Available online on:
October 13, 2026

Keywords:
Early Childhood; Project Based Learning; Number Concepts

Copyright ©2026 by Authors. Published by Universitas Muhammadiyah Tangerang

ABSTRACT

This study aims to improve number concept recognition skills in children aged 4–5 years through Little Chef: My Snack Project activities by implementing the Project Based Learning (PjBL) model. This study employed Classroom Action Research (CAR), conducted in two cycles, with each cycle consisting of two meetings. The research participants consisted of 16 children from Group A. Data were collected through observation, documentation, and assessment using children's developmental checklists. The data were analyzed using quantitative descriptive analysis to determine improvements in number concept recognition skills throughout the implementation of the actions. The findings indicate that implementing Little Chef: My Snack Project activities through the Project Based Learning (PjBL) model improved children's number concept recognition skills. The results showed an increase in children's achievement, with 59%

obtained in Cycle I, Meeting I, followed by 68% in Meeting II. In Cycle II, achievement increased to 79% in Meeting I and reached 87% in Meeting II. Thus, Little Chef: My Snack Project activities are effective as an alternative learning approach to improve number concept recognition skills among children in Group A.

Introduction

Early Childhood Education (ECE) is an educational level that plays an important role in providing stimulation for all aspects of children's development (Susanto, 2011). According to Law Number 20 of 2003 concerning the National Education System, Early Childhood Education (ECE) is a form of developmental support provided to children from birth to the age of six. Early childhood is often referred to as the golden age because children's development progresses rapidly during this period and serves as the foundation for development at subsequent stages (Agustina, S. R., et al. 2025). One aspect of development that requires stimulation from an early age is cognitive ability, particularly the ability to recognize number concepts. The ability to recognize number concepts serves as the foundation for children's mathematical development. Developing this ability is important for building logical thinking, mathematical reasoning, and problem-solving skills at subsequent educational levels (Nurhayati et al., 2024).

Indicators of number concept recognition skills in children aged 4–5 years include counting objects from 1 to 10, identifying the sequence

of objects and number symbols, matching the number of objects with the corresponding number symbols, and distinguishing between larger and smaller quantities of objects (Nisrina et al., 2020). Therefore, learning number concepts needs to be provided through concrete experiences that align with the learning characteristics of young children. Based on the observations conducted, the number concept recognition skills of children in Group A had not yet developed optimally. Most children experienced difficulties in mentioning number sequences, matching quantities of objects with the corresponding number symbols, and distinguishing between larger and smaller quantities of objects.

In addition, the children appeared less enthusiastic and tended to be passive when participating in number concept learning activities. This condition indicates that the learning activities implemented had not fully provided engaging, meaningful learning experiences appropriate to the characteristics of early childhood. Various studies have shown that contextual mathematics learning based on real-life activities is more effective than abstract learning (Rakhmanova, 2025). One learning model considered capable of providing meaningful learning experiences is Project Based Learning (PjBL). According to Astuti (2025), this model allows children to learn through direct experience, collaboration, and exploration while completing a project. Larasati (2024) demonstrated that PjBL can support children's cognitive,

affective, and psychomotor development in a balanced manner. Furthermore, Husna and Sari (2025) found that fun cooking activities can stimulate children's basic mathematical thinking skills through multisensory experiences. Nababan, Marpaung, and Koresy (2023) explained that Project Based Learning (PjBL) is a student-centered learning model that emphasizes the learning process through project activities leading to the creation of a product. Project-based learning is rooted in the constructivist theories proposed by Piaget and Vygotsky. Piaget argued that knowledge is constructed through children's interactions with new experiences through the process of assimilation. Meanwhile, Vygotsky (1978) emphasized that cognitive development occurs through social interaction, collaboration, and the provision of scaffolding within the Zone of Proximal Development (ZPD).

Furthermore, Dewey (1938) introduced the concept of learning by doing, which refers to learning through direct experience. Based on this perspective, Kilpatrick (1918) developed the Project Method, which positions learners as active participants in designing, implementing, and reflecting on learning projects. Thus, Project Based Learning is an approach that aligns with the learning characteristics of young children because it provides meaningful, contextual, and collaborative learning experiences. Although various studies have discussed the effectiveness of PjBL and fun cooking activities in early childhood education, research specifically integrating the Project Based Learning model with cooking

activities to improve number concept recognition skills among children aged 4–5 years remains limited.

Several previous studies have examined PjBL and direct experience-based activities with different focuses, participants, and activities. Regarding PjBL, Nurhayati et al. (2024) investigated the effect of PjBL on early childhood numeracy literacy, Rakhmanova (2025) linked PjBL to macaron-making activities in a STEM context, and Priyanti (2024) examined teachers' perceptions of PjBL in strengthening mathematical literacy. Regarding cooking activities, Husna and Sari (2025) analyzed the fun cooking activity "fruit skewers" within STEAM-based learning.

Based on this review, the present study differs in four aspects. First, in terms of focus, this study specifically targets number concepts (sequencing numbers from 1 to 10, matching quantities of objects with number symbols, and distinguishing between larger and smaller quantities), rather than numeracy literacy in general, symbolic thinking, or teachers' perceptions. Second, regarding participants, this study involves children aged 4–5 years, whereas several of the previous studies focused on children aged 5–6 years. Third, in terms of activities, this study integrates the PjBL stages with snack-making (cooking) activities, progressing from artificial materials in Cycle I to real materials in Cycle II, rather than using a single game or learning medium. Fourth, regarding research design, this study employs

Classroom Action Research conducted in two cycles, allowing changes in children's abilities to be traced at each meeting.

Based on this review, although various studies have discussed the effectiveness of PjBL and fun cooking activities in early childhood education, research specifically integrating the Project Based Learning model with cooking activities to improve number concept recognition skills among children aged 4–5 years remains limited. In fact, these activities allow children to directly engage in counting, grouping, comparing quantities, and matching quantities of objects with number symbols in an enjoyable learning environment. Therefore, integrating PjBL with Little Chef: My Snack Project activities represents an innovative alternative with the potential to improve children's number concept recognition skills.

Based on the explanation above, this study aims to determine the improvement in number concept recognition skills through Little Chef: My Snack Project activities using the Project Based Learning model among Group A children aged 4–5 years. This study is expected to make a theoretical contribution to the development of project-based numeracy learning in early childhood education and provide an alternative innovative, contextual, and child-centered learning strategy for early childhood educators.

Methods

This study employed Classroom Action Research (CAR). According

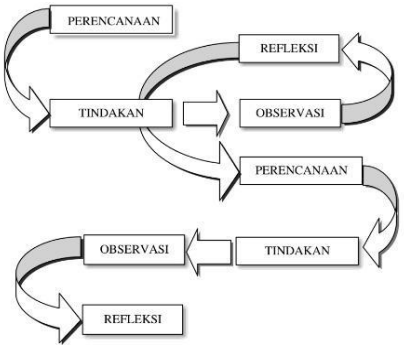
to Khaddafi et al. (2025), Classroom Action Research is a systematic approach aimed at helping educators find solutions to learning problems encountered directly in the classroom environment. Classroom Action Research (CAR) is research deliberately conducted to improve and enhance classroom learning. The Classroom Action Research method was selected for this study because it aligns with the characteristics of the problems being addressed, namely real problems occurring in the context of classroom learning, and actively involves teachers as an integral part of the research process (Salmah et al., 2025).

According to Yuliana (2023, as cited in Januati et al., 2026), the research design refers to the spiral model developed by Kemmis and McTaggart (1988). This model consists of several stages that form an action cycle and can be implemented repeatedly (recycling) until optimal improvements in the learning process are achieved. This study was conducted in two cycles, with each cycle comprising four main stages, as proposed by Kemmis and McTaggart (1988), as follows: **Planning**, which includes preparing the Lesson Plan (RP), providing learning media and instructional materials, and determining indicators of successful action. **Acting**, which involves implementing project-based learning activities through Little Chef: My Snack Project as an effort to introduce number concepts to children. **Observing**, which is conducted to observe children's responses and abilities throughout the learning activities. **Reflecting**, which involves evaluating the results of

the implemented actions to determine improvements for the subsequent cycle (R et al., 2025).

Figure 1. Kemmis and McTaggart's Classroom Action Research Design

(Source: Parnawi, 2020)



The study was conducted in Group A, involving children aged 4–5 years. The research participants consisted of 16 children, including 9 girls and 7 boys. The selection of participants was based on the need to improve children's number concept recognition skills, as identified during classroom learning activities.

Data collection in this study was conducted using three methods: observation, documentation, and assessment using a checklist instrument. Observation was used to obtain data regarding children's activities and the implementation of the learning process throughout the action. Documentation served as supporting data, including photographs of activities, attendance records, children's developmental records, and other documents relevant to the research focus. Meanwhile, the observation checklist was used to measure children's developmental

achievements based on predetermined indicators: sequencing numbers from 1 to 10, matching or connecting objects with numbers, and distinguishing between larger and smaller quantities of objects. The use of observation, documentation, and checklists in early childhood education research is considered effective for obtaining objective and systematic data on children's development (Sugiyono, 2022; Yus, 2020).

The data analysis technique employed was quantitative descriptive analysis, which involved calculating the percentage of achievement of children's developmental indicators in each cycle. Quantitative descriptive analysis aims to describe research findings in numerical form, which are subsequently interpreted to determine the level of success of the implemented actions (Sugiyono, 2022). To calculate the percentage of children's achievement in number concept recognition, the following formula was used:

$$P = \frac{F}{N} \times 100\%$$

Where:

- **P** = Percentage value
- **F** = Total score obtained by the children
- **N** = Total maximum possible score

The data obtained in this study were subsequently converted into numerical values. Each instrument item was assessed based on a developmental scale consisting of four categories, ranging from Not Yet Developed (BB) to Very Well Developed (BSB). The detailed scores for

each assessment category are presented in the following table.

Table 1. Assessment Scores and Categories

Developmental Category	Score	Code
Very Well Developed	4	BSB
Developing as Expected	3	BSH
Beginning to Develop	2	MB
Not Yet Developed	1	BB

The assessment of children's numeracy skills used a scale of 1–4 for each indicator. A score of 1 was assigned when the child's ability had not yet emerged or when the child was unable to perform the assessed indicator. A score of 2 was assigned when the child's ability had begun to emerge, but the child still required considerable assistance from the teacher during its implementation. A score of 3 was assigned when the child was able to perform the assessed indicator with minimal assistance or guidance from the teacher. Meanwhile, a score of 4 was assigned when the child was able to perform the indicator very well independently, without assistance from the teacher.

The assessment of number concept recognition skills in this study used developmental achievement criteria adapted from the Regulation of the Minister of Education and Culture Number 137 of 2014, Asmawati (2014), and Yus (2011). These criteria were used as a reference for categorizing the research findings expressed as percentage scores, with the aim of determining children's level of ability in recognizing number

concepts in a more measurable manner. The categorization of the research findings in this study refers to Yoni (2010, as cited in Ningsih, 2017), as presented in Table 2 below.

Table 2. Percentage Scores and Categories

Percentage Interval	Score	Category
76–100%	4	BSB
51–75%	3	BSH
26–50%	2	MB
0–25%	1	BB

The scores obtained were subsequently used as the basis for drawing research conclusions. These conclusions referred to the basic criteria previously described, which were then adjusted to the developmental characteristics of children in kindergarten. Furthermore, these criteria were modified by the researcher to establish number concept recognition skill criteria appropriate to the context of this study.

Result and Discussions

In the pre-cycle stage, the learning activities began with the researcher asking the children questions about their ability to count from 1 to 10, followed by an invitation for the children to count together. The observations showed that some children actively participated in the activity, while others remained silent. Several children appeared enthusiastic about participating in the activities; however, some still experienced difficulties in understanding number concepts.

The abilities observed in this study included three indicators: (1) sequencing numbers from 1 to 10, (2) matching the number of objects with the corresponding number symbols, and (3) distinguishing between larger and smaller quantities of objects. The results of the initial reflection, which were used as pre-cycle data, are presented below.

Table 3. Percentage of Achievement in the Pre-Cycle Stage

No.	Nama Anak	Pra Tindakan	
		Presentase Pencapaian	Status Pencapaian
1	KN	75%	BSH
2	GV	75%	BSH
3	HMH	50%	MB
4	KVN	50%	MB
5	NY	75%	BSH
6	AND	67%	BSH
7	FR	42%	MB
8	RR	50%	MB
9	SHK	50%	MB
10	KYA	50%	MB
11	FY	67%	BSH
12	AS	50%	MB
13	SDA	50%	MB
14	LT	67%	BSH
15	RY	75%	BSH
16	LA	50%	MB
	Rata-Rata	59%	

Based on the observations conducted during the pre-cycle stage, children's ability to recognize number concepts was still relatively low. The data showed that the average percentage of children's achievement was 59%. The implementation of Cycle I, Meeting I was conducted using a learning theme aligned with the school program. The activities began with greetings, a collective prayer, introductory activities, and singing to encourage children's enthusiasm for learning. Subsequently, the researcher explained the learning activities that would be conducted. Following the opening activities, the researcher introduced the Little Chef: My Snack Project activity, which would be carried out with the children. The results of children's number concept recognition skills in Cycle I are presented below.

Table 3. Percentage of Achievement in Cycle I, Meeting I

No.	Nama Anak	Pra Tindakan	
		Presentase Pencapaian	Status Pencapaian
1	KN	75%	BSH
2	GV	75%	BSH
3	HMH	58%	BSH
4	KVN	50%	MB
5	NY	75%	BSH
6	AND	67%	BSH
7	FR	42%	MB
8	RR	50%	MB
9	SHK	50%	MB
10	KYA	50%	MB
11	FY	67%	BSH
12	AS	50%	MB
13	SDA	50%	MB
14	LT	67%	BSH
15	RY	75%	BSH
16	LA	50%	MB
	Rata-Rata	59%	

Based on the observations conducted during Cycle I, Meeting I, the average percentage of children's achievement was 59%. The children's ability to recognize number concepts at this stage remained in the moderately developed category, with an average achievement of 59%. Of the 16 children participating in the study, 8 children (50%) achieved the Developing as Expected (BSH) category, while the remaining 8 children (50%) were still in the Beginning to Develop (MB) category. In Cycle I, Meeting I, no children had reached the Very Well Developed (BSB) category. These results indicate that children's number concept recognition skills had not yet achieved the predetermined success indicators.

During the second meeting of Cycle I, before beginning the activities, the researcher explained the project objectives and introduced the various materials and tools that would be used. The children appeared enthusiastic and interested when they saw the materials provided. The researcher then displayed number cards from 1 to 10 and invited the children to count together in sequence. Most children were

able to participate in the counting activity successfully, although some still required guidance in identifying the number sequence. Subsequently, the researcher explained the steps for making snacks using artificial materials. Tissue paper and modeling clay were used as the main materials and shaped into balls resembling snack balls. The children made snacks using the materials they had selected, then counted them and selected number cards corresponding to the quantities they had made.

When a child made five snacks, the child selected the number card representing the number 5. Similarly, when a child made six snacks and counted them, the child selected the corresponding number card, and so on. After all the children had completed their activities, the researcher invited them to compare the quantities they had made with those of their friends or other groups. The children were first asked to count their respective snacks and then determine which group or friend had a larger or smaller quantity. For example, one child made seven snacks, while another made five. The researcher encouraged the children to compare the two quantities through questions. The results of counting skills among children aged 4–5 years are presented below.

Table 4. Percentage of Achievement in Cycle I, Meeting II

No.	Nama Anak	Pra Tindakan	
		Presentase Pencapaian	Status Pencapaian
1	KN	92%	BSB
2	GV	75%	BSH
3	HMH	67%	BSH
4	KVN	67%	BSH
5	NY	83%	BSB
6	AND	75%	BSH
7	FR	67%	BSH
8	RR	67%	BSH
9	SHK	50%	MB
10	KYA	50%	MB
11	FY	75%	BSH
12	AS	58%	BSH
13	SDA	50%	MB
14	LT	75%	BSH
15	RY	75%	BSH
16	LA	58%	BSH
	Rata-Rata	68%	

Compared with the previous stage, which had an average achievement of 59%, an increase of 9% was observed. It can be concluded that the implemented actions demonstrated an improvement in children's ability to understand number concepts. However, during Cycle I, the learning activities were not yet fully concrete because artificial materials and tools were used in the Little Chef: My Snack Project activities. It was also found that several children remained less engaged and showed limited interest in the activities. Therefore, the researcher decided to continue to Cycle II, with the expectation that the average achievement would reach 80% and the Very Well Developed (BSB) category.

In Cycle II, the researcher used the topic "I Am a Great Child" with the subtopic "I Am Brave." The learning activities were implemented through a snack-making project that integrated number concept recognition skills with direct learning experiences. During Cycle II, the first meeting involved making chef hats, while in the second meeting, the children made snacks using real ingredients. In the first meeting of the Little Chef: My Snack Project, the children were invited to make chef

hats as accessories to be used during the cooking activities. The children cut out the hats and counted the number of cuts they made. They were then asked to write the number corresponding to the number of cuts. For example, if a child made ten cuts, the child was asked to write the number 10. The results of number concept recognition skills among children aged 4–5 years are presented below.

Table 5. Percentage of Achievement in Cycle II, Meeting I

No.	Nama Anak	Pra Tindakan	
		Presentase Pencapaian	Status Pencapaian
1	KN	100%	BSB
2	GV	100%	BSB
3	HMH	67%	BSH
4	KVN	75%	BSH
5	NY	100%	BSB
6	AND	75%	BSH
7	FR	67%	BSH
8	RR	75%	BSH
9	SHK	67%	BSH
10	KYA	67%	BSH
11	FY	100%	BSB
12	AS	50%	MB
13	SDA	50%	MB
14	LT	100%	BSB
15	RY	100%	BSB
16	LA	75%	BSH
	Rata-Rata	79%	

Based on the observations conducted during Cycle II, Meeting I, the average percentage of children's achievement increased to 79%. Compared with Cycle I, Meeting II, this represented an increase of 11%, while compared with the pre-cycle stage, the increase was 20%. At this stage, 6 children (37.5%) had achieved the Very Well Developed (BSB) category. Furthermore, 8 children (50%) were in the Developing as Expected (BSH) category, while the remaining 2 children (12.5%) were still in the Beginning to Develop (MB) category.

Cycle II continued with the second meeting. Before the activities began, the researcher prepared the various materials and tools required.

The activities started with greetings, a collective prayer, and singing children's songs. Subsequently, the researcher conducted introductory activities by introducing the ingredients to be used in the cooking activity and inviting the children to observe the shapes, colors, and quantities of the available materials. During the main activity, the children counted the number of biscuits they would use and then wrote the corresponding number symbols on paper. For example, a child took five biscuits, counted them, and wrote the appropriate number symbol. Afterward, the children were asked to work in groups to count the number of snack balls they had made and match the quantities with the corresponding number symbols. For example, if different groups made three, five, or six snack balls, the children had to select the number symbols corresponding to those quantities. The children were then asked to compare which quantities were larger and which were smaller. The results of the improvement in number concept recognition skills among children aged 4–5 years through the implementation of Little Chef: My Snack Project in Cycle II, Meeting II are presented in the following table.

Table 6. Percentage of Achievement in Cycle II, Meeting II

No.	Nama Anak	Pra Tindakan	
		Presentase Pencapaian	Status Pencapaian
1	KN	100%	BSB
2	GV	100%	BSB
3	HMH	100%	BSB
4	KVN	75%	BSH
5	NY	100%	BSB
6	AND	83%	BSB
7	FR	75%	BSH
8	RR	75%	BSH
9	SHK	75%	BSH
10	KYA	75%	BSH
11	FY	100%	BSB
12	AS	75%	BSH
13	SDA	75%	BSH
14	LT	100%	BSB
15	RY	100%	BSB
16	LA	83%	BSB
	Rata-Rata	87%	

The results showed that children's ability to recognize number concepts through the implementation of Project Based Learning (PjBL) activities in Little Chef: My Snack Project achieved very good results, with a class average of 87%. Of the 16 children participating in the study, 9 children (56.25%) achieved the Very Well Developed (BSB) category, while 7 children (43.75%) were in the Developing as Expected (BSH) category. No children remained in the Beginning to Develop (MB) or Not Yet Developed (BB) categories. These results indicate an improvement in children's achievement, with the average percentage increasing from 79% in the first meeting to 87% in the second meeting, representing an increase of 8%.

During the pre-cycle stage, the average achievement of the children was 59%, and some children remained passive. This condition is consistent with the description in the Introduction, which explains that abstract learning involves children less effectively than contextual learning based on real-life activities (Rakhmanova, 2025). In Cycle I, the achievement in Meeting I (59%) remained equivalent to that of the pre-cycle stage, possibly because the children were still becoming familiar

with the sequence of project activities. An improvement was observed only in Meeting II, when achievement increased to 68%, representing a 9% increase. During this meeting, the children counted the snacks they had made, matched the quantities with number cards, and compared their quantities with those of their friends. This pattern supports the findings of Husna and Sari (2025), who demonstrated that fun cooking activities can stimulate children's basic mathematical thinking skills through multisensory experiences.

It also supports the findings of Ma'rifat and Suraharta (2024), who reported that PjBL can support children's cognitive development. Theoretically, this improvement is consistent with Dewey's (1938) concept of learning by doing. Nevertheless, the achievement in Cycle I had not yet met the target of 80%. During this cycle, the activities still involved artificial materials and tools, meaning that the learning experiences were not entirely concrete, and some children remained insufficiently engaged. This indicates that improvements in number concept recognition skills were influenced not only by the implementation of PjBL but also by the concrete nature of the materials used, as emphasized in contextual learning (Rakhmanova, 2025).

In Cycle II, the average achievement increased to 79% in Meeting I, representing an 11% increase from Cycle I, Meeting II, and reached 87% in Meeting II, representing a further increase of 8%. During the second meeting, all children were in the Developing as Expected (BSH)

category (7 children) or the Very Well Developed (BSB) category (9 children), with no children remaining in the Beginning to Develop (MB) or Not Yet Developed (BB) categories. This improvement occurred after the project was implemented using real materials, and the children were asked to write number symbols, match the number of snacks with the corresponding number symbols, and compare quantities within their groups.

These group activities align with Vygotsky's (1978) perspective that cognitive development is supported through social interaction and scaffolding provided by teachers. Furthermore, the activities involving directly making and counting objects correspond to the experiential learning emphasized by Dewey (1938). Compared with studies using game-based learning media, such as snakes and ladders for children aged 4–5 years (R et al., 2025) and educational board games for children aged 5–6 years (Agya & Zainuddin, 2025; Afifah et al., 2019), the present study similarly demonstrates that concrete and enjoyable activities can serve as effective means of learning number concepts. However, it differs in the form of activities implemented, as children did not merely engage with learning media but also produced a product (snacks) through the stages of a project.

Thus, the findings of this study support previous research demonstrating the benefits of PjBL (Nurhayati et al., 2024; Ma'rifat & Suraharta, 2024) and fun cooking activities (Husna & Sari, 2025) for

children's basic skills. At the same time, this study differs from those studies in its specific focus on number concepts, its participants aged 4–5 years, and its use of snack-making projects. These findings address the research gap identified in the Introduction, namely the limited research integrating PjBL with cooking activities to improve number concept recognition skills among children aged 4–5 years. This study also provides additional findings indicating that improvements occurred gradually across meetings and became more pronounced after artificial materials were replaced with real ingredients. However, this study was conducted in a single group consisting of 16 children without a comparison group. Therefore, the findings cannot be generalized and require further investigation involving larger samples and broader research contexts.

Conclusion

Based on the findings of the study, it can be concluded that most children were able to understand the number concepts introduced during the learning activities. The children began to demonstrate the ability to distinguish quantities of objects, count observed objects, and identify groups of objects containing larger and smaller quantities. The findings indicate that children's number concept recognition skills improved following the implementation of Project Based Learning (PjBL) through Little Chef: My Snack Project activities. These results suggest that the learning model employed was able to provide effective learning

experiences in developing children's cognitive abilities, particularly in understanding number concepts. The implementation of this learning model had a positive impact on the development of number concept recognition skills in early childhood.

Future researchers are encouraged to develop learning activities that integrate the Project Based Learning (PjBL) model as an effort to improve number concept recognition skills among young children. Through these project activities, children can learn to count, determine the number of snacks they have made, group objects, and match quantities with corresponding number symbols in a more concrete and enjoyable manner. Furthermore, researchers can develop more innovative variations of activities, learning media, and project stages to enhance not only children's counting abilities but also their motor skills, creativity, cooperation, communication, and independence. Thus, learning becomes more meaningful and aligned with the learning characteristics of young children.

References

Afifah, A. N., Ilmiyati, N., & Toto, T. (2019). Model Project Based Learning (PjBL) berbasis STEM untuk meningkatkan penguasaan konsep dan keterampilan berpikir kritis siswa. *Quagga: Jurnal Pendidikan dan Biologi*, 11(2), 73–78. https://journal.uniku.ac.id/index.php/quagga/article/view/1910

Agya, B. F. N., & Zainuddin, M. (2025). Development of the educational game tool "Fun Mathematic Board" as a numeracy learning medium for 5–6-year-old children. *Journal of Educational Sciences*. https://jes.ejournal.unri.ac.id/index.php/JES/article/view/423

Agustina, S. R., et al. (2025). Penerapan metode bermain sambil belajar untuk meningkatkan kemampuan sosial siswa SD. *Diksi: Jurnal Kajian Pendidikan dan Sosial*, 6(1), 31–37.

Arlian, K., Permana, D., Gading, I. K., Ayu, I. G., & Agustina, T. (2023). Model Project Based Learning untuk meningkatkan kemampuan berpikir kreatif dan hasil belajar IPA kelas V SD. *Nama Jurnal/Media*, 3(3), 14692–14704.

Astuti, Y. P. (2025). Pengaruh penggunaan media flipbook terhadap keterampilan menulis siswa di sekolah dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 10(01), 212–226.

Azizah, W. I. N., & Widajati, W. (2013). Pengaruh metode proyek terhadap kemampuan pengenalan konsep bilangan pada anak kelompok A di TK Taruna Bhakti Tambaksari Surabaya. *Jurnal Mahasiswa Unesa*.

Daryati, M. E., Sari, D. Y., Riyanto, R., & Hatta, M. (2024). Pengaruh penggunaan media pembelajaran terhadap kemampuan mengenal konsep bilangan. *Journal of Education Research*, 5(3), 2474–2480. https://doi.org/10.37985/jer.v5i3.985

Dian, N., Gabriela, P., Pgsd, P. S., Kristen, U., & Wacana, S. (2021). Pengaruh media pembelajaran berbasis audio visual terhadap peningkatan hasil belajar siswa sekolah dasar. *Jurnal Pendidikan Dasar*, 2(1), 104–113. https://doi.org/10.17509/jpd.v2i1.28438

Husna, A., & Sari, P. P. (2025). Analysis of STEAM-based learning through "Fruit Skewers" fun cooking activities for early childhood. *Jurnal Penelitian Pendidikan IPA*. https://jppipa.unram.ac.id/index.php/jppipa/article/view/11820

Ilmiah, J., & Pendidikan, W. (2025). Penerapan model Project Based Learning untuk memaksimalkan hasil belajar matematika pecahan siswa kelas IV. *Jurnal Ilmiah Pendidikan*, 11(November), 133–142.

Januati, A., Ianatuz, Z., & Siswono, H. (2026). Peningkatan kemampuan kepekaan bilangan anak usia 4-5 tahun melalui media pohon angka di TK Theobroma 2 Gondang. *Inovasi: Jurnal Sosial Humaniora Dan Pendidikan*, 5(1).

Khaddafi, M., Panjaitan, S. P., Siagian, A., & Panjaitan, H. (2025). Analisis metodologi penelitian tindakan kelas (PTK) dalam

peningkatan praktik pembelajaran. *JIIC: Jurnal Intelek Insan Cendikia*, 2(5), 8613–8620.

Larasati, W. (2024). Peningkatan gotong royong siswa melalui model Project Based Learning berbantuan media audiovisual di Fase B Kelas 3 SDN Sumber 3 Surakarta. *Prosiding Seminar Nasional Pendidikan dan Agama*, 5(2), 1382–1397. https://doi.org/10.55606/semnaspa.v5i2.2190

Mardlatillah, S. D., & Sa'adah, N. (2022). Model pembelajaran yang menyenangkan berbasis gaya belajar pada peserta didik. *Edu Consilium: Jurnal Bimbingan Dan Konseling Pendidikan Islam*, 3(2), 45–55. https://doi.org/10.19105/ec.v3i2.6433

Ningsih, N. U. (2017). Peningkatan keterampilan motorik halus anak melalui kegiatan menganyam dengan berbagai media pada kelompok A2. *Jurnal Pendidikan Anak Usia Dini*, 7(6), 631–637.

Nisrina, R., Palupi, W., & Pudyaningtyas, A. R. (2020). Peningkatan kemampuan mengenal konsep bilangan melalui penggunaan media pop-up picture book anak usia 4-5 tahun. *Kumara Cendekia*, 8(3), 342–355. https://jurnal.uns.ac.id/kumara

Novanti, T. S., Fitri, R., & Jannah, M. (2025). The effect of gardening activities on cooperation skills and skills to recognize size concepts in children aged 5–6 years. *Studies in Philosophy of Science and Education*. https://scie-journal.com/index.php/SiPoSE/article/view/571

Nurhayati, L., Djoehaeni, H., Mariyana, R., & Rahaju, I. (2024). Pengaruh Project Based Learning terhadap kemampuan literasi numerasi anak usia dini. *Aulad: Journal on Early Childhood*, 7(2), 616–625. https://doi.org/10.31004/aulad.v7i2.645

Priyanti, N. (2024). Teachers' perceptions of project-based learning in strengthening mathematical literacy and problem-solving skills. *Indonesian Journal of Early Childhood Educational Research*. https://ejournal.uinmybatusangkar.ac.id/ojs/index.php/ijecer/article/view/16338

Priyatin, & Komalasari, D. (2013). Melalui permainan stik bergambar pada Dukuh Pakis Surabaya. *Jurnal Pendidikan Anak Usia Dini Universitas Negeri Surabaya*, 1, 1–7.

Rakhmanova, A. (2025). Project Based Learning methodology through the creation of original macarons in STEM context. *Sciences of Europe*. https://cyberleninka.ru/article/n/project-based-learning-methodology-through-the-creation-of-original-macarons-in-stem-context

Salmah, T., Siregar, I., Nola, I. S., & Hartati, T. (2025). Prosedur Penelitian Tindakan Kelas (PTK) mengubah tantangan menjadi solusi. *Jurnal Ta'limuna*, 3(1), 63–73.

Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.

Suryaningrum, C. W., & Anggraeni, A. W. (2025). Development and validation of a semiotic project-based module to support early childhood numeracy literacy. *Al-Ishlah: Jurnal Pendidikan*. http://www.journal.staihubbulwathan.id/index.php/alishlah/article/view/7589

Susanto, A. (2011). *Perkembangan anak usia dini pengantar dalam berbagai aspeknya*. Kencana Perdana Media Group.

Yuliana, V., Mariyana, R., & Romadona, N. F. (2025). The application of artificial intelligence technology in early childhood numeracy: Systematic literature review. *World Conference on AI and Education*. https://ieeexplore.ieee.org/document/11381105/

Yuliantina, I. (2025). Development of learning strategies to integrate computational thinking in early childhood education curriculum. *JPUD: Jurnal Pendidikan Usia Dini*. https://journal.unj.ac.id/unj/index.php/jpud/article/view/40841