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EFFORTS TO IMPROVE LEARNING FOCUS IN CHILDREN AGED 4–5 YEARS USING CODING WORKSHEETS

UPAYA MENINGKATKAN FOKUS BELAJAR PADA ANAK USIA 4–5 TAHUN MENGGUNAKAN LEMBAR KERJA KODING

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Abstract

This study was motivated by the low level of learning focus among 4-to-5-year-old children at Rumah Belajar Anak Ceria. It aims to improve the learning focus of children in Group A (aged 4–5 years) at the center through the use of coding worksheets. The study employed a classroom action research method focused on the classroom environment. It was conducted over two cycles each comprising planning, action implementation, observation, and reflection to observe improvements in the children's learning focus. The subjects were 10 children aged 4–5 years in Group A. The results showed that student performance levels were 35% in the pre-cycle stage, 55% in Cycle I, and 85% in Cycle II. These findings indicate that instruction using coding worksheets can be effectively implemented to improve the learning focus of children aged 4–5 years at Rumah Belajar Anak Ceria.

Keywords : Learning Focus, Early Childhood, Coding Worksheet, Classroom Action Research.

Abstrak

Penelitian ini dilatarbelakangi oleh rendahnya tingkat fokus belajar pada anak usia 4–5 tahun di Rumah Belajar Anak Ceria. Penelitian ini bertujuan untuk meningkatkan fokus belajar anak di Kelompok A (usia 4–5 tahun) melalui penggunaan lembar kerja coding. Metode yang digunakan adalah penelitian tindakan kelas yang berfokus pada lingkungan kelas. Penelitian dilaksanakan dalam dua siklus yang masing-masing mencakup tahap perencanaan, pelaksanaan tindakan, observasi, dan refleksi untuk mengamati peningkatan fokus belajar anak. Subjek penelitian terdiri dari 10 anak berusia 4–5 tahun di Kelompok A. Hasil penelitian menunjukkan tingkat capaian siswa sebesar 35% pada tahap pratindakan, 55% pada Siklus I, dan 85% pada Siklus II. Temuan ini mengindikasikan bahwa pembelajaran dengan menggunakan lembar kerja coding dapat diterapkan secara efektif untuk meningkatkan fokus belajar anak usia 4–5 tahun di Rumah Belajar Anak Ceria.

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Kata Kunci : Fokus Pembelajaran, Pendidikan Anak Usia Dini, Lembar Kerja Koding, Penelitian Tindakan Kelas.

1. INTRODUCTION

Early Childhood Education (ECE) represents a fundamental stage of education that plays an important role in supporting children's optimal growth and development. During this period, children experience rapid development across various domains, including cognitive, language, physical-motor, social-emotional, and learning abilities. Therefore, learning in early childhood should be designed according to children's developmental characteristics, provide meaningful experiences, and employ learning strategies and media that actively engage children. Children aged 4–5 years are characterized by a high level of curiosity, an active tendency to explore their environment, and an emerging ability to understand and follow simple instructions. Tahir (2019) explains that children aged 4–5 years begin to demonstrate the ability to understand simple instructions, possess high curiosity, learn through play, and develop language and peer interaction skills. Consequently, learning activities at this developmental stage need to provide appropriate stimulation so that children's potentials can develop optimally.

One of the essential abilities supporting successful learning in early childhood is learning focus or concentration. Learning focus refers to children's ability to direct their attention and thoughts toward a particular activity for a period appropriate to their developmental stage. Waskita et al. (2022) state that concentration refers to the ability to focus attention and thought on something being learned, enabling the learning process to take place more effectively. Agustina (2024) further explains that the ability to focus involves sustained attention, selective attention, and executive attention. These abilities enable children to maintain attention, select relevant stimuli, and regulate the allocation of their attention during learning activities.

Learning focus is important because it is directly associated with children's ability to listen to teachers' explanations, follow instructions, understand learning activities, complete tasks, and participate actively in the learning process. Greas et al. (2023) indicate that concentration enables children to direct their thoughts and attention toward learning activities, thereby facilitating their ability to understand learning materials, follow teachers' instructions, and complete tasks. Furthermore, focus is associated with children's ability to regulate their behavior, follow classroom rules, and control their responses during learning activities. Husain et al. (2025) emphasize that the ability to focus constitutes an important cognitive skill that influences children's academic and social development. Therefore, stimulation of learning focus is not only important for achieving learning objectives but also contributes to children's broader developmental outcomes.

Nevertheless, children's ability to maintain attention is still developing at the age of 4–5 years and differs considerably from that of adults. Young children generally have relatively short attention spans and can easily be distracted by sounds, objects, peers, or other activities in their surroundings. Permatasari et al. (2025) explain that young children have relatively short attention spans; therefore, learning should be designed to be engaging, enjoyable, and involve activities appropriate to children's developmental characteristics. This condition indicates that teachers should not merely deliver learning content but also select instructional strategies and media capable of sustaining children's attention throughout the learning process.

The development of learning focus can also be influenced by various internal and external factors. Internal factors include children's physical condition, mental and emotional readiness, and developmental characteristics, whereas external factors may include instructional strategies, classroom environments, patterns of interaction, and the use of learning media. Hasanah et al. (2024) explain that children's learning processes are influenced by the interaction between internal conditions and the learning environment. Similarly, Pratiwi et al. (2026) identify low concentration among young children as a complex problem that requires appropriate instructional strategies to help children maintain focus and learning stability. Consequently, monotonous learning activities and limited

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learning media may cause children to become bored easily, shift their attention to other activities, and experience difficulty completing tasks.

This problem was also identified during preliminary observations at Rumah Belajar Anak Ceria, Rawalumbu, Bekasi. The observations indicated that, among 10 children aged 4–5 years, six children had not yet demonstrated optimal learning focus. The children tended to pay insufficient attention to the teacher's explanations, were easily distracted by peers and their surrounding environment, showed limited concentration when reading books, and some were unable to complete assigned tasks. In addition, the learning media available at the institution were still predominantly limited to conventional notebooks, and there was no worksheet specifically designed to provide structured activities for developing children's attention. These conditions indicate a gap between children's need for engaging and varied learning experiences and the learning media available in the classroom.

One alternative learning medium that can be employed to address this issue is a coding worksheet. A worksheet can provide children with structured, focused, and manageable learning activities. However, worksheets for young children need to be designed attractively, developmentally appropriately, and non-monotonously in order to sustain children's attention. In this context, coding worksheets combine worksheet-based activities with basic concepts of coding and computational thinking. Amelya et al. (2025) explain that unplugged coding can introduce concepts of logic, algorithms, sequencing, repetition, decision-making, and problem-solving through concrete activities without requiring digital devices. Such activities allow children to encounter coding concepts through experiences that are concrete, enjoyable, and appropriate for their developmental stage.

Coding activities in early childhood are not intended to teach complex programming languages. Rather, they introduce children to structured ways of thinking through developmentally appropriate activities. Silvia (2022) explains that coding learning in early childhood can support logical thinking, analysis, critical thinking, and problem-solving abilities. Coding activities can be presented through simple tasks such as following sequences, identifying patterns, connecting directions, recognizing symbols, or completing particular pathways. Such activities require children to pay attention to instructions, maintain concentration, follow sequential steps, and complete tasks. Thus, coding activities have the potential to stimulate not only computational thinking but also children's ability to sustain attention during learning.

Coding worksheets are also consistent with developmentally appropriate learning because they can integrate visual elements, cognitive activities, simple problem-solving, and direct learning experiences. Dayurni and Rahmadhani (2025) developed MIKO (Misi Koding), a coding unplugged learning medium designed for young children aged 5–6 years, demonstrating the growing use of unplugged coding as an instructional approach in early childhood education. Similarly, Apriliani et al. (2026) investigated the implementation of unplugged coding worksheets to develop problem-solving abilities among children aged 5–6 years. These studies indicate that unplugged coding can provide children with opportunities to engage in structured challenges, follow sequences, and seek solutions through activities that do not require computers or other digital devices.

From a theoretical perspective, the use of coding worksheets is consistent with the constructivist approach, which positions children as active participants in constructing knowledge through experiences and interactions with their environment. Putri and Putra (2019) explain that children do not merely receive information passively but construct knowledge through experiences and interactions. From a Piagetian perspective, children aged 4–5 years are in the preoperational stage and increasingly use symbols, images, and language to understand their environment. Therefore, the use of pictures, patterns, symbols, and simple instructions in coding worksheets can be adapted to children's cognitive characteristics. In this context, the teacher serves as a facilitator who provides opportunities for children to explore, experiment, ask questions, and solve simple problems independently.

Previous studies have demonstrated the potential of coding and unplugged learning activities to support various aspects of early childhood development. Fitriyah et al. (2023) investigated daily-life-

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based unplugged coding practices to improve computational thinking among young children. Dayurni and Rahmadhani (2025) developed a coding unplugged gameboard for children aged 5–6 years, while Apriliani et al. (2026) examined the implementation of coding worksheets to develop problem-solving abilities. Furthermore, Tirta et al. (2025) specifically examined coding learning as an approach to improving children's learning focus. The references contained in the uploaded document indicate that coding-based learning has increasingly been explored as an innovative approach in early childhood education.

However, although previous studies have examined coding in relation to computational thinking, problem-solving, digital literacy, and learning focus, there remains a need to examine the use of coding worksheets as a specific instructional medium for improving learning focus among children aged 4–5 years. This distinction is important because worksheet-based coding provides structured visual tasks that require children to listen to instructions, follow sequences, maintain attention, and complete activities independently. Thus, the present study seeks to address this gap by investigating the implementation of coding worksheets as a learning medium for improving the learning focus of children aged 4–5 years.

Based on the above discussion, learning focus is an essential foundation for successful learning in early childhood, yet it requires appropriate stimulation that is consistent with children's developmental characteristics. The preliminary findings at Rumah Belajar Anak Ceria indicate that several children still experience difficulties in maintaining attention, following instructions, and completing learning tasks. At the same time, coding worksheets provide structured, visual, sequential, and problem-oriented activities that can encourage children to remain engaged throughout the learning process. Therefore, the implementation of coding worksheets is considered a relevant alternative learning strategy for improving children's learning focus. This study consequently aims to examine how the use of coding worksheets can improve children's ability to listen to teachers' explanations, follow instructions, complete tasks, maintain attention, and participate actively in learning activities. These indicators are consistent with the focus-learning assessment instrument developed in the uploaded research document.

2. RESEARCH METHOD

This study employed Classroom Action Research (CAR) to investigate the implementation of coding worksheets in improving the learning focus of children aged 4–5 years. Classroom Action Research was selected because it enables teachers and researchers to identify learning problems in the classroom, implement an intervention, observe its effects, and conduct systematic reflection to improve subsequent learning activities. The study was conducted collaboratively between the researcher and the classroom teacher at Rumah Belajar Anak Ceria, Rawalumbu, Bekasi, with the research subjects consisting of 10 children aged 4–5 years. The research was implemented in two cycles, with each cycle consisting of four stages: planning, action implementation, observation, and reflection. The second cycle was designed based on the findings and weaknesses identified during the first cycle.

The research began with a pre-cycle observation to identify the children's initial learning-focus conditions. The observation focused on children's ability to listen to the teacher's explanation, follow instructions, complete assigned tasks, maintain attention, and demonstrate active involvement during learning activities. The preliminary observation revealed that several children had difficulty maintaining attention, were easily distracted by their peers and surrounding conditions, and had difficulty completing learning tasks. These initial findings were used as the basis for designing an intervention using coding worksheets. The research instrument consisted of an observation sheet developed according to the five indicators of learning focus. Each indicator was assessed using four developmental categories: Belum Berkembang (BB), Mulai Berkembang (MB), Berkembang Sesuai Harapan (BSH), and Berkembang Sangat Baik (BSB).

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In the planning stage, the researcher and teacher prepared learning activities using coding worksheets that were appropriate for the developmental characteristics of children aged 4–5 years. The worksheets were designed with simple instructions, visual elements, patterns, sequences, and coding activities that required children to connect pictures, follow directions, identify patterns, and complete simple pathways. The researcher also prepared observation instruments to document children's learning-focus development during the intervention. In the second cycle, the learning plan was improved based on the reflection from Cycle I. The worksheets were made more varied and attractive, incorporating colorful images and themes familiar to children, such as animals and vehicles. The learning environment was also arranged to minimize distractions, while verbal praise and simple rewards, such as star stickers, were provided to encourage children's participation and persistence.

The action stage was implemented through structured learning activities involving coding worksheets. At the beginning of each learning session, the teacher prepared the classroom, established children's readiness to learn, conducted greetings and attendance, and engaged the children in prayer and other routine activities. Before working with the worksheets, children participated in simple preparatory activities related to the content, such as naming letters, recognizing geometric shapes, and counting from 1 to 10 and backward from 10 to 1. During the main activity, the teacher introduced the coding worksheet and explained the procedures gradually and clearly. Children were then asked to observe the worksheet and complete the coding task by following patterns, symbols, directions, or sequential instructions. The teacher provided assistance to children who experienced difficulties while allowing children who were able to work independently to complete the activity on their own.

The observation stage was conducted simultaneously with the implementation of the learning activities. The researcher and classroom teacher acted as observers and used the predetermined observation instrument to document children's learning-focus behaviors. Observations concentrated on five indicators: the ability to listen to the teacher's explanation, the ability to follow instructions, the ability to complete tasks, the ability to maintain attention, and active involvement in learning activities. The observation results were recorded according to the four developmental categories, namely BB, MB, BSH, and BSB. The observation process was conducted systematically during the learning activities to obtain information about changes in children's focus following the implementation of coding worksheets.

The reflection stage was conducted at the end of each cycle by comparing the observation results with the learning objectives and identifying aspects that still required improvement. Reflection after Cycle I showed that children's learning focus had improved only slightly compared with the pre-cycle condition. Some children were still easily distracted, had difficulty paying attention to the teacher's explanations, and had not consistently completed their tasks. Therefore, the researcher and teacher decided to continue the intervention into Cycle II with improvements to the learning media, classroom conditions, instructional procedures, and reinforcement strategies. In Cycle II, the activities were modified by providing more varied coding worksheets, attractive visual materials, familiar themes, clearer instructions, and positive reinforcement. These modifications were intended to increase children's motivation and sustain their attention during the learning process.

Data were collected through observation and documentation. Observation was the primary data-collection technique because the research focused on changes in children's observable learning-focus behaviors during classroom activities. Documentation was used to complement the observational data by recording the implementation of learning activities and the children's participation in completing coding worksheets. The collected data were analyzed descriptively by comparing the children's developmental achievements from the pre-cycle to Cycle I and Cycle II. The percentage of children's achievement was determined based on the scores obtained from the five learning-focus indicators in relation to the maximum possible score. The results were then categorized into BB, MB, BSH, and BSB to identify changes in the children's developmental level.

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3. RESULT AND DISCUSSION

The research was conducted through Classroom Action Research (CAR) in two cycles, preceded by a pre-cycle observation. The study involved 10 children aged 4–5 years in Group A at Rumah Belajar Anak Ceria, Rawalumbu, Bekasi. Each cycle consisted of planning, action implementation, observation, and reflection. The learning intervention was implemented using coding worksheets designed to encourage children to follow instructions, recognize sequences and symbols, complete tasks, maintain attention, and participate actively in learning activities.

Pre-Cycle Results

The pre-cycle observation indicated that the children's learning focus was still relatively low. Children were easily distracted during learning activities, had difficulty paying attention to the teacher's explanations, and were not yet able to complete assigned tasks consistently. Of the 10 children, six were identified as having undeveloped learning-focus abilities.

The initial achievement level was **35%**, indicating that the children had not yet achieved the expected level of learning focus. This condition became the basis for implementing coding worksheets as an intervention.

Cycle I Results

In Cycle I, coding worksheets were introduced through structured learning activities. The teacher provided simple coding worksheets and instructions, while the researcher observed five indicators: listening to the teacher's explanation, following instructions, completing tasks, maintaining attention, and active participation.

The results showed an improvement compared with the pre-cycle condition. The overall achievement increased from 35% in the pre-cycle to 55% in Cycle I. Children began to demonstrate greater ability to listen to instructions, follow learning steps, and participate in completing the worksheets. However, some children were still easily distracted and required teacher assistance.

Cycle II Results

Based on the reflection from Cycle I, several improvements were implemented in Cycle II. The coding worksheets were made more attractive by adding pictures and colors, while the learning activities were made more varied. The teacher also provided clearer and more varied instructions and positive reinforcement in the form of star stickers.

The results of Cycle II showed substantial improvement. The total score obtained by the 10 children was 170 out of a maximum score of 200, equivalent to 85%, which exceeded the predetermined success criterion of 80%.

Table 1. Development of Children's Learning Focus from Pre-Cycle to Cycle II

Research Stage	Achievement	Interpretation
Pre-Cycle	35%	Initial condition; learning focus was still low
Cycle I	55%	Beginning to develop
Cycle II	85%	Achieved the expected success criterion

The data demonstrate an increase of 20 percentage points from the pre-cycle to Cycle I and a further 30 percentage points from Cycle I to Cycle II. Overall, learning-focus achievement increased by 50 percentage points, from 35% to 85%. The research document reports this increase as evidence that coding worksheets could improve the learning focus of children aged 4–5 years.

Results Based on Learning-Focus Indicators in Cycle II

The more detailed results of Cycle II show that all children had reached at least the BSH category on each of the five observed indicators. No child was classified as BB or MB.

Table 2. Children's Learning Focus by Indicator in Cycle II

Learning-Focus Indicator	BSH	BSB	BB	MB
Listening to teacher's explanation	60% (6 children)	40% (4 children)	0%	0%
Following instructions	70% (7 children)	30% (3 children)	0%	0%
Completing tasks	80% (8 children)	20% (2 children)	0%	0%
Maintaining attention	30% (3 children)	70% (7 children)	0%	0%

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Active participation	50% (5 children)	50% (5 children)	0%	0%

The highest proportion of BSB achievement was found in maintaining attention, with 70% of children reaching the BSB category. This was followed by active participation, with 50% of children reaching BSB, while listening to teacher explanations reached 40% BSB. These findings indicate that the coding worksheet activities were particularly effective in encouraging children to maintain attention during the completion of structured tasks.

Table 3. Individual Scores in Cycle II

No.	Child	Score	Percentage
1	**C-001**	20	100%
2	**C-002**	15	75%
3	**C-003**	19	95%
4	**C-004**	17	85%
5	**C-005**	18	90%
6	**C-006**	17	85%
7	**C-007**	17	85%
8	**C-008**	15	75%
9	**C-009**	17	85%
10	**C-010**	15	75%
Total		**170**	**85%**

The individual data indicate that most children achieved scores between 85% and 100%, while three children achieved 75%. Despite these individual differences, the collective achievement reached 85%, exceeding the predetermined criterion of 80%.

The results demonstrate that the implementation of coding worksheets was associated with a substantial improvement in the learning focus of children aged 4–5 years. The improvement was evident from the progressive increase in achievement from 35% in the pre-cycle, to 55% in Cycle I, and 85% in Cycle II. This progression suggests that the intervention was increasingly effective as the learning activities and worksheet designs were refined based on the results of reflection.

The initial condition indicates that learning focus was a significant challenge for the children. Six of the 10 children were identified as having undeveloped learning-focus abilities, with children frequently becoming distracted, having difficulty listening to explanations, and requiring assistance to complete tasks. This finding emphasizes the importance of providing learning activities that are structured, engaging, and developmentally appropriate for young children.

The increase observed in Cycle I suggests that coding worksheets began to provide an appropriate stimulus for children's attention. During this stage, children began to follow teacher instructions, follow the steps contained in the worksheets, and become more actively involved in completing the activities. Nevertheless, the 55% achievement level indicated that the intervention had not yet reached the predetermined success criterion. Some children continued to require guidance and were still easily distracted.

The improvement in Cycle II can be understood in relation to the modifications made following the Cycle I reflection. The researcher and teacher improved the worksheets by adding more attractive pictures and colors and varying the instructional activities. In addition, the teacher provided more varied instructions and positive reinforcement through star stickers. These modifications appear to have contributed to children's greater engagement and persistence in completing the tasks.

The findings are also consistent with the developmental characteristics of children in the preoperational stage described by Piaget. Children aged 4–5 years increasingly use symbols and simple representations to understand their environment and learn effectively through concrete experiences. The coding worksheets used in this study incorporated symbols, pictures, patterns, and sequential instructions that could be processed by children through concrete and visual experiences. The structured nature of the worksheets also required children to concentrate on one task before moving to the next.

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The strongest improvement occurred in the ability to maintain attention, with 70% of children reaching the BSB category in Cycle II. This result is particularly important because maintaining attention represents a central component of learning focus. Coding worksheet activities require children to observe carefully, identify the appropriate sequence, follow directions, and continue working until the task is completed. Consequently, children are encouraged to sustain their attention toward a specific goal rather than continuously shifting their attention to other stimuli.

The ability to follow instructions also showed positive development, with 70% of children reaching BSH and 30% reaching BSB. This finding suggests that coding worksheets provided a concrete context in which children could practice following sequential directions. Instead of merely listening to verbal explanations, children were required to translate instructions into actions on the worksheet. This combination of verbal instruction and visual representation may have made the learning task easier for children to understand.

Similarly, task completion reached 80% BSH and 20% BSB. This finding indicates that all children were able to reach at least the BSH category in completing their worksheets. Coding activities required children to work through a sequence until reaching the expected outcome. Such activities can encourage persistence and task completion because children have a clear visual representation of what they need to accomplish.

The development of active participation was also evident, with half of the children reaching BSB and the other half reaching BSH. The researcher's observations indicated that children became more enthusiastic and actively involved in completing their worksheets. The use of varied worksheets and positive reinforcement helped create a more engaging learning environment. The study's conclusion similarly notes that children became more enthusiastic and were able to complete the assigned activities with greater focus and independence.

The findings are consistent with the conceptual understanding of coding worksheets presented in the research. Coding worksheets integrate basic coding and computational-thinking concepts into developmentally appropriate worksheet activities. Such activities encourage children to follow instructions sequentially, develop logical thinking, and solve simple problems. Therefore, the improvement in learning focus observed in this study may be related to the structured and sequential nature of coding activities.

The results also support the relevance of unplugged coding as an early childhood learning approach. Coding activities in this study did not require computers or other digital devices. Instead, children interacted directly with worksheets containing symbols, images, patterns, and sequences. This approach allowed children to engage with coding concepts through concrete activities while simultaneously practicing attention, instruction-following, and task completion.

An important finding is that the success criterion established before the intervention was 80% achievement in the BSB category. The overall achievement in Cycle II reached 85%, indicating that the research criterion had been exceeded. This result provided the basis for concluding the classroom action research after Cycle II rather than proceeding to another cycle.

Overall, the findings indicate that the use of coding worksheets provided a meaningful learning experience for the children. The gradual improvement from the pre-cycle through Cycle II suggests that the effectiveness of the intervention was not solely determined by the worksheet itself but also by the way the teacher presented the activity, provided instructions, managed the learning environment, and gave positive reinforcement. Therefore, coding worksheets can be considered a potentially useful learning medium for stimulating the learning focus of children aged 4–5 years, particularly when the activities are designed to be visual, structured, sequential, varied, and developmentally appropriate.

It should be noted, however, that the findings are based on a classroom action research study involving only 10 children in one learning setting. Therefore, the results primarily describe improvement within the particular classroom context and should not be interpreted as evidence of universal effectiveness. Further research involving larger groups, different educational settings, and

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comparative designs would be useful to strengthen the evidence regarding the effectiveness of coding worksheets in developing children's learning focus.

4. CONCLUSION

Based on the results of the classroom action research conducted at Rumah Belajar Anak Ceria, Rawalumbu, Bekasi, it can be concluded that the implementation of coding worksheets can improve the learning focus of children aged 4–5 years. The improvement was demonstrated through the progressive development of children's learning-focus abilities from the pre-cycle to Cycle I and Cycle II. The overall achievement increased from 35% in the pre-cycle to 55% in Cycle I and subsequently to 85% in Cycle II. This result indicates an overall improvement of 50 percentage points from the initial condition and demonstrates that the intervention exceeded the predetermined success criterion of 80%.

The improvement was evident across the five observed indicators of learning focus, namely listening to the teacher's explanation, following instructions, completing tasks, maintaining attention, and active participation in learning activities. In Cycle II, all children reached at least the BSH category across these indicators, with no children remaining in the BB or MB categories. The highest achievement was observed in the ability to maintain attention, in which 70% of children reached the BSB category. These findings indicate that coding worksheets provided children with structured activities that encouraged them to concentrate on specific tasks, follow sequential instructions, and complete learning activities with greater persistence.

The effectiveness of the intervention was also supported by improvements made between cycles. The use of more varied and attractive worksheets, clearer instructions, appropriate visual stimuli, reduced distractions, and positive reinforcement helped create a more engaging learning environment. The coding worksheets provided children with concrete and structured experiences involving symbols, patterns, images, and sequences, which were appropriate to the characteristics of children aged 4–5 years.

Therefore, coding worksheets can be considered an appropriate alternative learning medium for stimulating and improving learning focus among children aged 4–5 years, particularly when implemented through engaging, structured, visual, sequential, and developmentally appropriate activities. The findings further emphasize the importance of teachers' ability to select and develop varied learning media that can maintain children's attention, encourage active participation, and support children in completing learning tasks independently.

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