

# Ape Taktor to Increase the Ability to Recognize the Concept of Number Symbols in Early Children

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Abstract. One of the principles of learning for early childhood is at the age of 5-6 years, namely being active, creative, and fun, which can be realized by using educational game tools (APE). In the use of educational game tools, there is an element of fun learning because children will play while learning. APE is one of the media for teachers to deliver learning materials. Appropriate and appropriate educational game tools, it has an impact on all aspects of children's development. The use of media can create situations that allow children to gain skills, knowledge, and general behavior including people, materials, equipment, and activities. All children certainly need educational game tools, without educational game tools children will be bored and not enthusiastic about carrying out activities or simulations. Parents certainly want to give the best for their children. So don't be surprised if parents generously use their money to buy educational games for their beloved children. APE TAK TOR is an educational game tool made from coconut shells. This game tool has a traditional and aesthetic impression. This APE aims to stimulate children's cognitive development in counting and introduce the concept of numbers. The educational game tool TAK TOR is expected to be feasible and effective in developing the cognitive development of children aged 5–6 years, especially recognizing the concept of numbers 1-10. APE TAK TOR is an educational game tool made from coconut shells. This game tool has a traditional and aesthetic impression. This APE aims to stimulate children's cognitive development in counting and introduce the concept of numbers. The educational game tool TAK TOR is expected to be feasible and effective in developing the cognitive development of children aged 5-6 years, especially recognizing the concept of numbers 1-10. APE TAK TOR is an educational game tool made from coconut shells. This game tool has a traditional and aesthetic impression. This APE aims to stimulate children's cognitive development in counting and introduce the concept of numbers. The educational game tool TAK TOR is expected to be feasible and effective in developing the cognitive development of children aged 5-6 years, especially recognizing the concept of numbers 1-10.

Keywords: Early Childhood Education · Number Concepts · Number Symbols

#### 1 Introduction

Early childhood based on the view of neuroscience is at the age of 0–8 years. In Indonesia, early childhood is included in the 0–6 year age category according to the law [1]. The age of 0–6 years is the most important period of all human dynamics. At that age, the development and potential of children are important to be developed in preparing quality human resources [2]. At this time the child's development takes place very quickly, is the most sensitive and very decisive for the realization of the optimization of the next stage of development [3]. Therefore, various positive stimulation in honing children's development must be done from an early age. One aspect of development that has an important role in children's lives is cognitive development in symbolic thinking, namely the concept of numbers and mathematics.

The scope of cognitive development that must be achieved by early childhood following the Child Development Achievement Level Standard (STPPA) includes problemsolving abilities, logical thinking, and symbolic thinking [4]. Of the three spheres of cognitive development, one that should not be ignored is the scope of symbolic thinking, because in symbolic thinking abilities children begin to use symbols when they use an object or action to represent something that is not in front of them [5]. It is stated in the Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 137 of 2014 concerning the National Standards for Early Childhood Education that "Symbolic thinking includes the ability to recognize, mention, and use the concept of numbers, recognize letters.

In Piaget's theory of cognitive development, namely at the preoperational stage age 2 to 7 years. In this stage, object determination is firmly established, and symbolic thinking develops [6]. Children's abilities grow, and children begin to form mental representations of events and ideas. According to Jamaris (2013: 85), there are conducive conditions for children's cognitive development efforts, namely 1) providing various opportunities for the emergence of creative behavior. Symbolic games performed by children are a vehicle that can be used in developing children's cognitive. Fantasy and imagination are forms of creativity that are displayed by children. 2) Showing children that the fantasy and imagination they display have certain values. Seeing these conditions, the child will be interested and not bored in cognitive development. Fun, effective, and efficient conditions in children's learning can be done with educational games.

Mathematics is one of the subjects that are always used in everyday life [7]. In terms of buying and selling an item, time, and so on. Number operations such as arithmetic operations involving addition, subtraction, multiplication, and division will always be used in everyday life. Therefore, it is important to introduce basic mathematical concepts in early childhood. Before children master arithmetic operations of addition, subtraction, multiplication, and division, children must master the ability to count sequentially and understand the concept of numbers well.

But, from the results of mini research in the field, it is known that in teaching early mathematics to children, many parents or educators ignore their children's ability to count sequentially and tend to prioritize introducing number symbols first to children. To introduce number symbols to children, it must be based on the child's ability to count sequentially first and count sequentially with objects, then transition to the number of

objects and number symbols [8]. This problem is part of the ability to think symbolically in children aged 5–6 years.

In addition, in the field, many children are found to have memorized the form of number symbols or numbers, but when it comes to presenting their meaning, children are still confused [8]. For example, if the teacher asks the child to point to the symbol or number 2, the child can show it correctly. But when the child was asked to help get two candies, the child took 3 candies. This shows that the child has recognized the symbols for numbers or numbers, but the child has not been able to count sequentially or precisely.

One of the solutions to this problem is to make a play tool that makes it easier for children to do sequential counting activities using objects and connecting them with number symbols. In this study, the research team made an educational game tool made from coconut shells with the aim that children can count with real objects and recognize number symbols. The main purpose of this research is the introduction the concept of numbers 1–10 and with the condition that this tool is applied to children, it is hoped that children can count in sequence from 1–10 orally and children can count with objects sequentially.

It is strengthened by the results of previous research by Amalia, et al. that there are problems that arise related to mastering the concept of simple numbers including (1) regarding understanding mathematical concepts, for example, children are only able to mention numbers without understanding how the symbols of the numbers are. (2) children have not been able to sort numbers. This is further strengthened by the results of previous research [9] at the AS Bustanul Athfal 1 Kindergarten Bandar Lampung from observations in the field that the majority of children have not been able to think symbolically as expected. Of the many children who still have difficulty distinguishing and matching number symbols. This condition is due to teacher learning activities tend to only carry out assignments without using media, even children are rarely allowed to express their ideas and ideas according to the child's wishes because all ideas and ideas come from the teacher. This is because the learning media used by the teacher is only in the form of children's worksheets containing tasks that must be done by children related to calistung so that children's symbolic thinking skills do not develop as expected. From the two basic research backgrounds, it can be concluded that the teacher's understanding of the introduction of the concept of numbers where the basic requirements that must be mastered by children first, namely children can count sequentially orally and count sequentially using objects are still not well understood. The biggest possibility is to be skipped/skipped, In general, the teacher immediately introduces the number symbol or number symbol. In addition, varied learning media is needed [10].

The principle of learning for early childhood is active, creative, and fun which can be realized by using educational game tools. In educational game tools, there are elements of fun learning because children will learn while playing. The use of media can create situations that allow children to gain skills, knowledge, and general behavior including people, materials, equipment, and activities [4, 11] APE PAUD is anything that can be used as a means or equipment for early childhood play, which contains an educational value and can optimize child development [12]. Based on this opinion, it can be concluded that the Educational Game Tool is a play tool specifically designed for children's

education to stimulate aspects of child development. APE can be played by children independently or with the guidance of educators (parents and teachers).

Based on the analysis of the problems above regarding the imbalance between the conditions that occur in the field and the expected conditions, the researchers and the team will apply the TAK TOR educational game tool (Batok Rotate) which can be used by children 5–6 years old to develop cognitive development, especially children's abilities. in sequential counting and recognizing the symbol of the concept of numbers and it is hoped that this product can help parents and teachers as a supporting medium in providing stimulation to children.

#### 2 Method

This research uses a descriptive qualitative method. According to Gunawan, qualitative research is research that seeks to understand and interpret the meaning of an event of human behavior interaction in certain situations according to the researcher's perspective [13]. The rationale for using this descriptive qualitative method is that this research wants to know about the effectiveness of the application of APE TAK TOR in children aged 5–6 years. In addition, this research is more appropriate to use descriptive qualitative research because researchers need to go directly to the field with the object. Through this method, the researcher will get complete results that can be described clearly so that the results of this study are truly following the existing conditions. In this research, The subject of this research is early childhood with an age range of 5–6 years, b) the subject is familiar with numbers sequentially or randomly, and c) the subject already knows about the concept of numbers. With the specified criteria, researchers can obtain as much information as possible regarding the application of APE to produce maximum research.

The implementation is carried out in 4 institutions in Surabaya, namely Al Falah Assalam Tropodo Kindergarten, Liya 3 Kindergarten, 'Aisyiyah Bustanul Athfal 17 Kindergarten, and Tunas Bangsa Kindergarten. The results obtained were obtained from the research subjects, as well as from the results of interviews with educators who teach at the institution. The research team first coordinated with the 4 institutions on how to install and use the TAK TOR tool and coordinate the schedule for conducting research. In addition, researchers also provide videos on how to install APE TAKTOR and how to use APE TAKTOR on the unesa channel in the youtube application (https://www.youtube.com/watch?v=TRNPKRdJnu0&list=PLevyHK\_NG0sDwW AyV6XSz4n69b2IUdlWj&index=1).

In this study, the researcher was not directly involved, the researcher made observations through the data obtained from the teacher. Researchers took two sources of data, namely: Primary data sources. In this study, the primary data source used was by conducting direct interviews with the research subjects, who were students or students in the intended institution. In addition, there are secondary data sources, secondary data sources can be obtained from the results of documentation in the form of videos, notes, and so on. The method used is an interview, observation, and documentation.

The data collection technique used by the researcher is as follows: Interview, in this study the interview was conducted to complete data that was not obtained by observation



Fig. 1 .

or other techniques. In addition to doing observations, observation activities are carried out by attending the intended institution. This observation activity is carried out directly by applying the APE TAK TOR. Data collection techniques also use documentation, in digging up information in this study, in addition to using interviews and observation methods, researchers also use documentation methods in the form of videos. The data analysis model used in this research is descriptive analysis. This research will describe the application of APE TAK TOR in kindergarten.

The shape of the Tak Tor tool is shown in Fig. 1 APE Tak Tor.

In Fig. 1 we can see that APE TAK TOR consists of 11 coconut shells, where 10 coconut shells are given a bamboo handle and formed into a circle. Meanwhile, 1 coconut shell is placed in the middle of a circle formed from 10 coconut shells. There are number cards in the shape of a circle and large pom-poms. The number of pom-poms provided is 100 pieces.

APE TAK TOR uses materials from bamboo and coconut shells, these two materials were chosen because they are easy to obtain and easy to manage. The wood material is also fairly safe if used as a play tool for early childhood. The materials used to make APE do not always have to be new, used goods can also be used to make APE. Making APE must pay attention to the level of security and safety of children, starting from the materials used, simple designs, and most importantly the benefits according to the child's age stage.

The parts of APE TAK TOR and how to install APE TAK TOR can be seen in Figs. 2 and 3:



Fig. 2. APE TAKTOR before being assembled



Fig. 3. The process of assembling APE TAKTOR

From Figs. 2 and 3 it can be seen before being assembled, APE TAKTOR consists of 10 coconut shells with bamboo handles. There is a pole as a support and a central tool so that the handle rod can rotate, number cards 1–10 are circular, and 1 cloth bag containing 100 fairly large pom-poms. The APE TAK TOR is intentionally detachable so that the APE is easy to carry everywhere and can be stored in a safe place. How to install and remove the APE TAK TOR is also very easy, so it doesn't make it difficult for the teacher to use it and finish using it.

### **3** Result and Discussion

The principle of learning for early childhood is active, creative, and fun which can be realized by using educational game tools. In educational game tools, there are elements of fun learning because children will learn while playing. The educational game tool that we use is TAK TOR (Rotating Shell) which aims to be used by children 5– 6 years old in developing cognitive development, especially children's ability to count sequentially and recognize number concept symbols. The implementation was carried out in 4 kindergartens in Surabaya, namely Al Falah Assalam Tropodo Kindergarten, Liya 3 Kindergarten, 'Aisyiyah Bustanul Athfal 17 Kindergarten, and Tunas Bangsa Kindergarten.

The implementation of learning using the TAK TOR Educational Game Tool in Al Falah Assalam Tropodo Kindergarten can be proven by the results of the practice of 6 children in group B regarding the implementation of APE TAK TOR in Al Falah



Fig. 4. Children seem happy playing in groups



Fig. 5. Child counting with pom-poms

Assalam Tropodo Kindergarten (https://www.youtube.com/watch?v=3mfsVuHUBN4). When the activation process using APE TAK TOR goes very well because children not only play but can also learn with the APE. This activity is carried out to develop cognitive abilities in children. In addition to cognitive development, children can also develop aspects of emotional and social development in this APE TAK TOR game, children can communicate well with their friends. When children play APE TAK TOR looks very enjoyable. The teacher pays attention to every activity that the child does from the time he enters the number cards according to the number of shells when he counts pom-poms to match the number cards on the shell. They like the process of playing while learning to use APE TAK TOR. They can easily fit the pom-poms according to the numbers. Children are very enthusiastic and do not feel bored when doing learning activities using this APE TAK TOR. This can be seen in Figs. 4 and 5.

In line with the implementation in al Falah Assalam Kindergarten, the implementation of the TAK TOR Educational Game Tool in Tunas Bangsa Kindergarten is not much different from before, it is proven that APE TAK TOR helps children in counting activities to develop aspects of cognitive development. (https://www.youtube.com/watch? v=osO7s9Dht1Q&list=PLevyHK\_NG0sDwWAyV6XSz4n69b2IUdlWj&index= 15,https://www.youtube.com/watch?v=BAR84T\_43oo&list=PLevyHK\_NG0sDwW AyV6XSz4n69b2IUdlWj&index=16).



Fig. 6. The teacher explains how to play



Fig. 7. Children count alternately

The teacher invites 6 students to learn while playing using APE TAK TOR. When the learning process takes place the child can understand how to use this APE TAK TOR. Previously the teacher explained in advance how to use this APE TAK TOR. Furthermore, children can use APE TAK TOR according to the instructions given by the teacher. The Tunas Bangsa Kindergarten children were enthusiastic and patient while waiting for their turn to put the pom-poms into the shells. When doing additions using APE TAK TOR children can do it well and of course, they are happy because learning to use APE TAK TOR according to them is a new thing and of course exciting for children. This can be seen in Figs. 6 and 7.

Meanwhile, the implementation of the TAK TOR Educational Game Tool in TK Liya 3 Surabaya and TK Aisyiyah Bustanul Athfal 17 was carried out with one of the children of group B instead of being carried out in group form. Although the implementation is not in groups, learning using APE TAK TOR is very effective for developing children's cognitive development.

The implementation at Liya 3 Kindergarten went smoothly. During the activation process, the children seemed to enjoy it. During the process, it is easier for



Fig. 8. Child picking up pom-poms in the middle

children to understand using APE TAK TOR compared to using LKA (https://www. youtube.com/watch?v=-sYTbsg1zDM&list=PLevyHK\_NG0sDwWAyV6XSz4n69b 2IUdlWj&index=13). Educational Game Tool is a play tool specifically designed for children's education to stimulate aspects of child development. APE can be played by children independently or with the guidance of educators (parents and teachers). Learning activities while playing using APE TAK TOR begins with the child mentioning the numbers on the number card. Then the child enters the pom-poms according to the numbers on each shell. Looks like the child can insert the pom-poms correctly. Children are very excited when inserting pom-poms into the shell according to the number card because they think it is fun and not boring. The teacher looks painstaking at the beginning of teaching children to use APE TAK TOR. It is proven that APE TAK TOR is very useful for teachers to use in introducing the concept of counting to children aged 5–6 years. This can be seen in Figs. 8 and 9.

Meanwhile, the implementation of the TAK TOR Educational Game Tool in 'Aisyiyah Bustanul Athfal 17 Kindergarten Surabaya can be proven with very satisfactory results (https://www.youtube.com/watch?v=80DLX5Sm0vM&list=PLevyHK\_N G0sDwWAyV6XSz4n69b2IUdlWj&index=12/https://www. Youtube.com/watch?v = LOsxwlRXvcw&list = PLevyHK\_NG0sDwWAyV6XSz4n69b2IUdlWj&index = 11). Playing activities (learning) is a child's world. Playing using the TAK TOR educational game tool can fulfill all aspects child's happiness. When the child feels happy, the child's brain growth is increasing perfectly increase so that it will be easier for children to carry out the process the learning. In addition to entering pom-poms according to the number cards in the shell, the teacher can also invite children to do additional counting activities using APE TAK TOR. It seems that children to learn to count. Implementation of the use of APE TAK TOR in TK Liya 3 and kindergarten 'Aisyiyah Bustanul Athfal 17 can be seen in Figs. 10 and 11.

Based on the description above, an in-depth picture has been obtained about developing cognitive development, especially children's ability to count sequentially and



Fig. 9. Child putting pom-poms



Fig. 10. Child picking up pom-poms

recognize number concept symbols using the educational game TAK TOK (Rotating Shell) which was carried out in 4 kindergartens, namely Al Falah Assalam Tropodo Kindergarten, Liya 3 Kindergarten., and 'Aisyiyah Bustanul Athfal 17 Kindergarten, and Tunas Bangsa Kindergarten. This product is very helpful for teachers as a supporting medium in introducing the concept of numbers 1–10. APE TAK TOR can be an alternative learning media that is quite effective in introducing the concept of numbers 1–10 using APE TAK TOR compared to using LKA [14]. In addition, this is also in line with the research results [14] which state that the use of thematic LKPD can increase students' independence and learning outcomes, but cannot increase students' learning motivation [15]. One of the reasons is that through this APE children can practice directly or learn by doing by counting pom-poms and learning to recognize symbols from certain numbers. In addition, the children seemed enthusiastic in carrying out the teaching and learning process because of the new learning media that had never existed before in their class.



Fig. 11. Children put pom-poms in shells

In addition to being fun for children, APE must pay attention to the elements of child safety and security. The materials used must be safe when played with by children. There are certain requirements for the manufacture of APE, the following are the technical requirements for making APE: 1. APE is designed according to the purpose, and the function of the facility (does not cause conceptual errors) for example in making building blocks, the accuracy of accurate shapes and sizes is fulfilled because if the size is inappropriate will lead to misconceptions, 2. APE should be multipurpose, even though it is intended for a specific purpose it is possible to use it for other development purposes, 3. APE is made using materials that are easily available in the environment, cheap or from used/leftover materials, 4. Safe (does not contain elements that harm children, such as sharp, toxic, etc.), 5.

# 4 Conclusion

Educational game tools (APE) as teaching materials in early childhood cognitive development. This educational game tool is made using coconut shells that are intentionally collected to be made into an educational game tool (APE). The used goods are formed in such a way as to become a tool that can make it easier for children to understand the concept of mathematical numbers. Implementation of the TAK TOR Educational Game Tool (Batok Play) was carried out at several institutions, including Al Falah Assalam Tropodo Kindergarten, Liya 3 Kindergarten, and 'Aisyiyah Bustanul Athfal 17 Kindergarten, and Tunas Bangsa Kindergarten. 5–6 years running at maximum this can be seen from the activities after the children use the APE they find it easier to understand the concept of numbers than using the LKA. From these observations, it shows that the TAK TOR Educational Game (APE) tool can increase children's interest in learning, develop children's creativity, develop children's imagination, train concentration, and make it easier for children to recognize the concept of numbers. APE TAK TOR in its implementation can be used for individual and group learning media. In its use in groups, APE TAK TOR can be applied in the form of games. APE TAK TOR is one of the recommendations as a learning medium in introducing concepts 1–10 for early childhood. APE TAK TOR in its implementation can be used for individual and group learning media. In its use in groups, APE TAK TOR can be applied in the form of games. APE TAK TOR is one of the recommendations as a learning medium in introducing concepts 1–10 for early childhood. APE TAK TOR in its implementation can be used for individual and group learning media. In its use in groups, APE TAK TOR can be applied in the form of games. APE TAK TOR is one of the recommendations as a learning medium in introducing concepts 1–10 for early childhood.

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