

Introduction of early childhood mathematics through online learning (e-learning) during the covid-19 pandemic period

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Abstract. Mathematics is an exact science that is systematically organized, which learns about numbers, sizes, space and time, and interprets various ideas and conclusions. Mathematical abilities that are introduced to early childhood include: understanding the concept of numbers, algebraic concepts, classification abilities, understanding patterns, geometry, and measurements. During the covid-19 pandemic period, learning was carried out at distances like the implementation of online learning. In this study, a literature study of various sources was carried out relating to the introduction of mathematics on early childhood through online learning. The result of the literature study shows that the introduction of mathematics on early childhood through online learning can be done by learning through educational games media, Play Kids, social media, and video conference

1. Introduction

Early childhood is a child who is aged 0-6 years. At this stage children need a lot of stimulus to develop aspects of their development such as religious and moral values, physical motorics, language, cognitive, social emotional, and art. Aspects of cognitive development include general knowledge, science, concepts of shape, color, size, patterns, and mathematics. Mathematics is an exact science that is systematically organized, which learns about numbers, sizes, space and time, and interprets various ideas and conclusions[1]. the characteristics of introducing mathematical concepts of early childhood including: mastery of the concept of numbers, understanding concepts, counting, distinguishing numbers by showing numbers or numbers with symbols or symbols[2]. Mastery of the concept of number is the basis for children to be able to use the concept of numbers or numbers using concrete media, for example 3 oranges, 5 books.

Children aged 4-6 years generally have mathematical abilities that include understanding of the concept of many little, say many objects, recognize the concept of numbers 1-20, recognize symbols of numbers, match numbers with symbol numbers, calcify objects based on size, shape, or color, recognize AB-AB and ABC-ABC patterns, sort objects based on 5 size seriations, geometries, and measurements[3].The National Council of Teachers of Mathematics (NCTM) 2000, states the mathematical concepts that can be taught to early childhood include[4]: (a) Concept of Numbers. One of the important mathematics to understand is the introduction of the concept of numbers. The ability to understand the concept of numbers is not only the ability to recognize numbers and counting but includes the ability to understand quantity and one-on-one suitability. (b) The Concept of Algebra. NCTM in Smith states, the introduction of the concept of algebra can be started by teaching children to sort, classify, compare, and arrange mass objects based on size, shape, number, color, and so on. (c) Classification Ability. Classification is the process of grouping objects based on certain properties (color, size, number, shape). The ability of classification is one of the important abilities developed to understand the concept of numbers. In the process of classification children will do the activity of comparing and compiling. Comparing is a child's process to build a relationship between two or more objects according to certain characteristics. Early childhood often makes a difference, especially if the comparison involves them personally. Composing is a higher level of comparison. Arranging involves comparison of more objects, placing objects in one order. Arranging activities can be done inside and

outside the room, for example arranging blocks from the shortest to the longest, or arranging stones from the smallest to the largest stones. (d) Understanding Patterns. Identifying and creating patterns associated with classification and sorting. Children begin to see the same and different attributes in pictures and objects. Children like to make patterns in their surroundings. (e) Geometry. Building the concept of geometry in children begins with identifying shapes, investigating, building and separating ordinary images such as rectangles, triangles, and circles. (f) Measurement. Measurement involves assigning numbers of units to physical quantities (such as length, height, weight, volume) or to non physical quantities (such as time, temperature, or money). Physical quantities such as the length of table may be measured by repeated application of the unit directly on the object. This process is called iteration. Nonphysical quantities such as time use an direct method. Clocks and calendars are two intruments used to measure time. Temperature measures use a thermometer. Money measures worth or value, and coins and bills are used. Young children discover the pproperties of formal measuring system by using informal or arbitrary units. These units may be body units: thumbprints, hands, feet, or the length of their arms. Or they may measure I paper clips, blocks, unifix cubes, beans, or paw prints of common animals. Older children begin to use customary (English) units or the metric system. With either system the method is the same. However, it takes many years before a secure foundation, or a way of thinking regarding measurement, is in place.

Early childhood have problems in understanding mathematics such as children having difficulty recognizing the symbol of numbers, classifying objects, sorting objects based on 5 seriations of size, geometry, and measurement. The child's inability is usually caused by the lack of teacher variation in teaching, the use of learning methods that are not appropriate, teacher learning is less attractive, and the teacher does not use instructional media[1]

The ability to think mathematically at an early age can be characterized by the child being able to present a mathematical understanding through understanding symbols based on a combination of symbols found themselves that can be reflected in the culture around the child. Children have the ability to create symbols to help them understand the concept of numbers

According to Schwartz (2005) suggested there are several characteristics of children learning mathematics including [5]: (a) The child uses his knowledge, but cannot express that knowledge. (b) Children get knowledge from social activities and children's interactions with others. From this explanation can be concluded that children learn mathematics through playing and exploring activities. These activities make children more interested and fun to be actively involved in learning activities.

Early Childhood Math Games among other things: (a). Playing numbers. Playing numbers children are expected to be able to recognize and understand the concepts of numbers, transitions and symbols according to the number of objects and can match sesai with symbol numbers. (b). Playing Patterns. Playing patterns, children are expected to recognize and arrange the patterns that are around children sequentially. Children are able to make their own sequence of patterns according to their creativity after understanding 2 or 3 patterns shown by the teacher. (c) Play Classification. Classification play activities of children are expected to group or choose objects based on the type, function, colour, shape, pair according to the example determined and assigned by the teacher. (d). Playing geometry. The activity of playing geometry for children is expected to be able to recognize and mention various objects based on geometric shapes by observing the objects around them. (e). Play Measurement. The measurement game for children is expected to be able to recognize the concept of standard measurement which is informal or natural, such as length, large, height, and contents through non-formal measuring devices such as hand span, rope, fingers, steps. Formal measuring instruments such as rulers, meters, thermometers and others.

Understanding mathematics is important to be taught in early childhood. The teaching can be obtained from parents, the surrounding environment and if they are already in school age, they will get a stimulus from the school environment. During the covid-19 pandemic required all parties to stay at home in order to break the chain of distribution of covid-19. So that educational activities are carried out online, both from the level of early childhood education to tertiary level. Children's learning activities at home involve parents in controlling children's learning. When learning is done at

school teaching and learning activities only involve teachers and children, but because during the covid-19 pandemic learning is done at home, learning activities do not only involve teachers and children but also parents. Parents have a very big role in children's learning activities at home, parents oversee children's learning and ensure the tasks given by the teacher are done well by the child. Covid-19 pandemic has an impact on various aspects of the main aspects of education. In the aspect of education the main impact seen is that online learning must be carried out. Online learning makes various parties feel difficulties both from the school, teachers or students. Many of the schools and teachers are not ready to carry out online learning due to the low mastery of technology from educators, limited infrastructure, costs, and internet networks[6]. The problem is also experienced by students, which becomes the obstacle of students in implementing online learning is the limited infrastructure, costs and networks. These three points are the most common problems experienced by children. Children who do not have a device that is able to support the online learning process will tend to be left behind. Likewise for networks, children who live in difficult-to-use areas cannot participate in online learning smoothly.

This change in civilization requires educators to prepare themselves to follow technological developments, because if they are unable to master technology, they will be left behind, as will educators in early childhood education. Early childhood education educators must be more creative in stimulating six aspects of child development, especially mathematical abilities. Knowledge about mathematics is an important knowledge to be introduced to early childhood, because in everyday life we often use mathematical abilities such as to see time, count objects, count money, recognize shapes, classify objects and so on. This example is a small part of the use of mathematics in everyday life. Mathematics is able to penetrate into all fields of life. Thus it is important to introduce mathematics to children from an early age. During the covid pandemic 19, the introduction of mathematics in early childhood must still be taught as a whole without exception even though it must be done through online learning. Online learning or e-learning is information and communication technology to enable students to learn whenever and wherever[7]. Learning system on e-learning is done online or commonly called open source, a learning system using web applications. Learning through e-learning has many benefits including: (a). Make students become more independent in learning, and students become more active in gathering materials according to their needs. (b). Reducing Institute operating costs. (c). Learning can be done anywhere and anytime so it is not limited by distance, space and time. (d). The ability to take responsibility from each teacher and learning has increased in the teaching and learning process. Based on the explanation above, the writer intends to know in depth about how to introduce mathematics to early childhood through online learning

2. Method

The type of research used is literature review. The purpose of this research is to find out deeply about how to introduce mathematics to early childhood through online learning. The procedures for carrying out a study of literature are: a) Organize, is organizing the literature that will be reviewed / reviewed. The literature reviewed is relevant / in line with the problem. b) Synthesize, which unites the results of the organization of literature into a summary in order to become a unified unity, by looking for links between literature. c) Identify, namely identifying controversy issues in the literature. d) Formulate, namely formulating questions that require further research[8].

3. Result and Discussion

Based on the results of the literature review shows online learning that can be done to introduce mathematics to early childhood among other things:

- b. Educational game media. Educational game is a technology that is used as an innovative learning media to support teaching and learning activities. Educational games can be made with the Adobe Flash CS6 Professional application[9]. Learning mathematics through games designed by the teacher for example to introduce the concept of numbers to children. Children can recognize the concept of numbers by counting images of objects in games that have been set to make the display more interesting. In the activity of recognizing the concept of patterns and relationships can be

done by arranging patterns based on large-small or small-large sizes in the game application by drawing images in sequence[10]. Besides that, children can arrange patterns based on the color or shape of objects. For material concepts of numbers and patterns as well as relationships done by the animation simulation method on a computer or laptop, so students can easily understand the subjects in the mathematics learning presented. Children try interactive multimedia learning about number recognition, the concept of patterns and relationships, geometry, and measurement. they are able to operate the buttons in the multimedia without the help of the teacher. Children can learn independently using multimedia interactive learning, but even though children are able to use themselves when learning online parents must still assist so that learning activities can be in accordance with the planned learning goals. Presentation of online learning materials through interactive learning multimedia is complemented by images and animations that are presented in an interesting manner, so that children are indirectly involved auditively and visually. Thus, the material presented is more easily understood by children. Text that is presented simultaneously with images allows the information received to be easily understood by children[11].Educative application as a learning media for early childhood mathematics introduction uses play and learning methods that can attract children's attention to enjoy learning

- c. Play Kids. play kids is a learning media that contains a series of activities that children can do in learning a certain material. Play kids is able to create interactive learning such as the introduction of mathematics in early childhood will be more effective than conventional learning. In online learning the presence of learning media like this will help children to get to know the concepts and materials being taught. Play kids media also makes it easier for parents to stimulate aspects of children's cognitive development and other aspects of development.
- d. Learning mathematics through social media. Learning mathematics through social media can be done by giving worksheets or projects uploaded on whatsapp, line, telegram, email, Instagram, or youtube. Children with parental assistance will do the task and upload the results on agreed social media
- e. Video Conference. Video conferencing that is widely used is zoom, google meet, and cisco webex. Learning with video conferencing is able to create learning conditions through face to face directly, so that the teacher is easier to convey learning material and the material is also easier to understand by children

4. Conclusions

Mathematical abilities that are introduced to early childhood include: understanding the concept of numbers, algebraic concepts, classification abilities, understanding patterns, geometry, and measurements. Introduction to early childhood mathematics through online learning can be done by learning through educational games media, Play Kids, social media, and video conference.

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Language development in children age preschool

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Abstract. Language is an expression of innate or innate human abilities. From birth we have been equipped with the capacity to be able to use language. The ability to use language is instinctive, but the capacity for each person is different, depending on what specific language they are using. Language development begins at birth, and even some developmentalists argue that language development has begun before birth. The first cry, the first babble, the first words of all these are auditory evidence that the child participates in the process of language development. Language helps to expose us as human beings and represents one of our most amazing intellectual achievements. In the development of language in preschoolers, it is inseparable from the factors that will occur, so this problem is seen as needing research that aims to find out how language development in young children preschool at this time with the development of the times. This study included a literature study of the type of data taken secondary data. Sources and methods of data collection by taking data in the library, reading, recording, and processing research materials. from the results of research using literature studies it turns out that language development in preschoolers still needs to be paid attention to and does not meet the competencies of the research results it can be concluded that the language development of preschool age children is largely influenced by the surrounding environment. Therefore reduce the prevalence of language development in preschool children, we as parents or teachers should conduct early detection or monitoring growth and development that can be done using play media.

1. Introduction

Indonesia is a developing country. Have many languages. Along with the development of the era, we will also experience developments in the region. Development is a process of change in which children will learn to master high levels of various aspects, one of which is the development of language. Language itself is a communication tool that is very important in human life in addition to communication tools Language is also a tool to overcome the feelings and thoughts of others. Language plays an important role in human life which is generally in conversation activities (Laird 1957: 16) without humanity without language and without peradap without oral language.

Childhood is the most appropriate time to develop language because at this time the child is called the "golden age" because here the child is very sensitive who will get good stimuli related to physical, moral, social, social, language disputes. Early development is very important compared to now because of the basis of children's learning by learning and experience. Language contributes very

rapidly to the development of children to become more mature, from the help of language children will grow from biological relationships into individuals in groups, and that person thinks, feels, understands, tries and sees the world and its surroundings.

In the language development of preschool age children is definitely different from children as they have advanced school because in this early age we need lots of ideas or motivation to encourage development to support or stimulate the development of preschool language. One that is often used by teachers or educators in stimulating the language development of preschool children is by playing methods.

Play is a nature in early childhood because in playing children can also learn and learn while playing therefore play activity is part of the world of children. In the process of learning or learning will be more memorable and interspersed with playing. Experts in the field of English development believe that play activities can foster cognitive, social, motor and language development. When playing this child will communicate or talk, interact and adjust to peers or other people around him. If children love to learn something or activities, they will certainly continue to be interested in agreeing on learning, children get learning experiences that require and the learning process gets better.

2. Method

Based on the literature study in the literature review formed questions from research, namely 1.) what is meant by the language development of preschoolers and 2.) what are the aspects of knowledge for language development of preschoolers, the type of data used is secondary data. While the data collection method is literature study. The method to be used to study this is a literature study. The data obtained are compiled, analyzed and concluded so as to get a conclusion regarding language development in preschoolers.

3. Discussion

A. Language Development in Preschool Children

In their lives children experience a continuous process that is growing and developing into a more perfect and mature individual. Development is a structure and function of the body that is more complex in the ability of coarse motion, smooth motion, speech and language as well as socialization and independence (Soetjningsih, 1995). Where in this case language development is a fundamental stage for the development of children's lives. Children with good language skills will affect the life of communication and how to interact with others, so that their desires and needs for something can be poured through their ability to speak and speak (Yusuf, 2011) ..

Language can help define us as humans and represent one of our most amazing intellectual achievements. For early childhood language development begins at birth, even developmentalists argue that [language development begins before birth. These first cries, chatter, and first words are auditory evidence that the child participates in the process of language development. Eric, Dilan, Tammy and Maria show that the complexity of children during preschool in the aspects of phonetic, semantic, morphemic and pragmatic language knowledge is increasing. Adults who are not used to having difficulties will understand what toddlers are trying to communicate, but they are easier to understand preschool age children (Clay: 1991). Preschoolers can speak their mother tongue more accurately, observe the meaning of adult words and use more vocabulary. The syntactic knowledge of preschoolers is more complex and they are better able to communicate precisely than toddlers. They are also able to participate verbally in conversations in turn. In this case the child's knowledge will be more developed during preschool.

Preschoolers continue to explore language in five aspects of language knowledge including how to pronounce it, how language communicates, etc. This exploration process coincides with the process in its environment, dynamic interactions connect these two types of exploration. Language and environment exploration is very influential on the child's ability to ask questions as a follow-up to a conversation. Language acquisition for school-aged children is embedded in the environment where

children interact, especially their home environment and the preschool or daycare environment. The factors that can affect language development in preschoolers are:

- **Brain development and intelligence**
Here brain development during early human life is related to language development. The crying of a newborn baby is controlled by the stem and pons, which is the most primitive and fastest-growing part of the human brain. This explains that before the age of 12 months, naturally a child is not able to talk to the phoneme (the sound of the correct speech).
- **Gender**
The difference in language development between boys and girls can be explained biologically and socially. It is said that the development of the left cerebral hemisphere in the brain in girls appears faster (Berk, 2009), this part of the brain that plays a big role in language development. In addition, environmental influences accustom girls to at home playing with the puppets they are talking to, helping parents and other activities that make them more likely to interact with other adults who talk. Meanwhile, boys are more directed at mastering motoric abilities that demand them to be more move more than talk.
- **Physical condition**
Language development and acquisition requires a variety of physical conditions, one of which is that the person has no problems with excess speech (teeth, tongue, lips, throat, vocal cords), auditory organs (ears), and the neuromuscular system in the brain. In order for a child's language development to proceed normally, all of these tools must be able to function properly and effectively.
- **Family environment**
The family environment is the closest environment the most important children to facilitate language development in children. From infancy to age 6, children spend more time at home so they interact more with family members. Children with parents who actively invite to talk, read stories, and intensely interact verbally will get better language skills (papalia, 2009). Sometimes an only child is generally slower than those who have siblings, as well as a child who rarely goes out of the house will have fewer ideas and concepts.
- **Economic Conditions**
In this factor sometimes children who are in a low economic environment will develop slowly compared to children in the middle environment. Children in the middle environment have parents who have an adequate level of education for the child's development such as books and stationery for language development.
- **Cultural Environment**
From a variety of cultures makes a difference in the development of children's languages, especially the national language or Indonesian. Children who are in the local environment who are accustomed to using local languages will be difficult if the child uses Indonesian, for example, in children in Java, most good children will not argue with their parents because there children are not given the opportunity to express ideas and opinions, then the child will experience difficulty in language while children in the Jakarta environment are more familiar with or using slang so that children are difficult to use Indonesian and formal environments.

B. As for aspects to expand children's language development, among others;

- **Home environment**
As for the buffer language of parents the most important thing how parents help in the development of language through the style of buffering language means that parents will provide learning by providing information and encouragement needed by parents children can provide oral and non-verbal tasks that children cannot do on their own . Interaction strategies This supportive language sometimes occurs in the context of problem-solving as in puzzle games. The Buffering Language Strategy is also part of the process of building conversations and continuing that conversation with children. Language and action are components of the Buffering Language strategy. Besides supporting language from parents there is an educated environment. Here the role of the learned home environment in its contribution to language and reading skills has been

documented by a number of studies. The most important activities without sharing picture story books or reading story books together, reading story books at home have close links with higher linguistic and cognitive abilities to help the development of children's language knowledge.

- **Class environment**

In this classroom environment, there is a great deal of diversity in the number of conversations, language in the classroom is also influenced by the number of children in a group of teacher's theoretical views and the goals of class achievement (eg fostering the ability to read and write), and the special atmosphere in the class (such as class length) . In this class environment the ability to talk to children will be more extensive because it provides opportunities for spontaneous conversations between children.

- **Development of phonetic knowledge**

In the development of phonetic knowledge at the age of schoolchildren have begun to focus on using certain phonemes (language) when talking and realize that children can produce words that have similar sounds. In preschool age has a sound game which is a stimulation activity that develops phonetics such as the similarity of sounds in words and songs.

- **Development of semantic knowledge**

In the development of semantic knowledge at the age of school-age children already understand vocabulary that develops and becomes more refined or precise during the period of preschool years as the child begins to develop concepts and schemata that are more complex for interconnected concepts. When children meet new experiences they have the opportunity to develop their language as soon as they refer or respond to these new experiences. The development of vocabulary develops very quickly in preschool age.

- **Development of syntactic knowledge**

At preschool age the development of syntactic knowledge can be seen when the child can speak no longer from the words but the child can already speak in short sentences and phrases consisting of two to three words. In this syntactic knowledge the child can not only speak in speeches but the child can also know or complex noun phrases and working words, question sentences and passive sentences. So during preschool significant changes occur in children's syntactic understanding. Beginning children seem to use simple sentences of two and three words, while at the end of the school year children begin to use various types of sentences (statements, questions) which are characterized by greater complexity.

- **Morphemic knowledge development**

During this period of significant development for morphemic knowledge, children first develop inflexional morpheme knowledge which is used to indicate plural words, ownership, and verbs. This usually starts at the age of 2 to 4 years. Some words follow predictable patterns for morpheme use and are called regular. For example with most nouns being changed from singular nouns into plural nouns by adding -s (cats). Regular verbs are changed by adding -ed (wolk, so wolket). If ownership is indicated by adding -s.

- **Development of pragmatic knowledge**

In the phase of development of pragmatic knowledge children begin to use language for various purposes compared to those they had in the past. This development is supported by the semantic, syntactic, phonetic knowledge of children which has been increasing. Use of knowledge Pragmatic language is seen when a child at the age of 4 wants a toy that is being used by another child. This message may be communicated in various ways, using different levels of pitch, loudness, and tempo and non-verbal behavior. Through frequent interactions with children children experience and use language differently and in different situations and conditions

4. Conclusion

The preschool period is characterized by rapid development in every aspect of language knowledge. Each of these developments must have factors including the factors of language development of preschool age children such as gender, environment, culture, brain development exportation of written language occurs when children are in the environment where events related to

reading and writing often occur and where adults respond to children's questions about written language. Children begin to develop an understanding that letters can be associated with certain sounds with certain words or intentions. Therefore we as adults must be smart to apply learning with a variety of methods, strategies and even media to support language development in preschool children. Each of the five aspects of language knowledge is an important aspect to consider in understanding language development among preschoolers.

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