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THE IMPORTANCE OF BUILDING MATHEMATICAL KNOWLEDGE IN EDUCATION CHILDREN

THE CONSTRUCTION OF MATHEMATICAL KNOWLEDGE AND ENVIRONMENTAL KNOWLEDGE IN CHILDHOOD EDUCATION

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SUMMARY

Several studies and statistical data point to Mathematics as the subject that most elementary school students fail. Furthermore, children reach the final grades seeing this subject as the bogeyman of schools. Given this context, this study presents reflections and analyzes about the construction of Mathematical knowledge in Early Childhood Education, whose purpose is to understand the implications of teaching practice in the teaching of Mathematics, understanding that Early Childhood Education is the primordial stage of Basic Education, in which the Children are in a developmental phase of natural curiosity experiencing the discovery of the environment that surrounds them. In this context, Mathematics is a subject that, if well worked on, can contribute to developing significant skills that will help the child to better understand this world. However, the teacher's intervention in working on mathematical knowledge linked to environmental issues in classroom activities will enable the student to develop such skills. The work is an excerpt from the theoretical contribution that underlies the Doctoral Thesis that investigates teaching practice in the construction of mathematical knowledge in preschool children. The study shows the importance of teaching Mathematics in Early Childhood Education, relating the construction of knowledge to children's knowledge for meaningful learning in Pre-school.

Key words: Mathematical Knowledge. Child education. Meaningful learning

RESUME

Several studies and statistical data point to Mathematics as the material that most suspends primary students. Furthermore, children reach the final stages of this matter as the cocoon of schools. In this context, this study presents reflections and analyzes about the construction of mathematical knowledge in Early Childhood Education, whose purpose is to understand the implications of teaching practice in Mathematics teaching, understanding that Early Childhood Education is the primordial stage of it. Basic Education, in which El Niño finds himself in a phase of development of natural curiosity, experimenting with discovering the environment that surrounds him. In this context, Mathematics is a discipline that, when worked hard, can contribute to the development of significant skills that will help a child understand this world better. However, the intervention of the teacher in the work of mathematical knowledge linked to environmental issues in classroom activities will allow the student to develop these skills. The work forms part of the theoretical contribution that underlies the Doctoral Thesis that investigates teaching practice in the construction of mathematical knowledge in pre-school children. The studio demonstrates the importance of

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the teaching of Mathematics in Early Childhood Education, relating the construction of knowledge with the knowledge of children for significant learning in Preschool.
Keywords: Mathematical Knowledge. Early Childhood Education. meaningful learning

SUMMARY

Several studies and statistical data point to Mathematics as the subject that most fails Elementary School students. In addition, children reach the final grades seeing this subject as the bogeyman of schools. Given this context, this study presents reflections and analyzes about the construction of mathematical knowledge in Early Childhood Education, whose purpose is to understand the implications of teaching practice in teaching Mathematics, understanding that Early Childhood Education is the primordial stage of Basic Education, in which The child is in a phase of development of natural curiosity experiencing the discovery of the environment that surrounds him. In this context, Mathematics is a discipline that, if well worked, can contribute to the development of significant skills that will help the child to better understand this world. However, the teacher's intervention in working on mathematical knowledge linked to environmental issues in classroom activities will enable the student to develop such skills. The work is part of the theoretical contribution that underlies the Doctoral Thesis that investigates the teaching practice in the construction of mathematical knowledge in preschool children. The study shows the importance of teaching Mathematics in Early Childhood Education, relating the construction of knowledge to children's knowledge for meaningful learning in Preschool. Keywords: Mathematical Knowledge. Child education. meaningful learning

1. INTRODUCTION

The teaching-learning process of Mathematics in Early Childhood Education is understood as a relevant factor in helping children develop and build knowledge that enables them to understand their reality. Because Mathematics is, above all, a way of thinking and the sooner this way of thinking is worked properly with children, the more positively the foundations of meaningful learning will be stabilized.

In the process of building mathematical knowledge, when the teacher recognizes the child's cultural context, valuing their environmental knowledge, classes become more attractive with useful, lively, dynamic and meaningful content, as the environment in which the individual is inserted provides various information that establish relationships with logical-mathematical knowledge.

In this sense, D'Ambrosio (2005) highlights the need for Mathematics teaching that respects social issues and serves as an instrument of cultural advancement. According to him, the applicability of Mathematics only has real value when it meets the need to solve life's problems and this is the meaning of its existence.

Therefore, this work had the general objective of "analyzing the factors that interfere in the process of building Mathematical knowledge in this stage of Basic Education, which is of fundamental importance, which is Early Childhood Education", as this stage is the basis of any individual's school life, and if this foundation is not well planned, if the teacher does not have broad knowledge proposing well-structured activities that respect and value the students' sociocultural environment, the student will certainly not have good results in their educational process.

It is believed that adequate pedagogical practice is not so natural and it is not enough to just like children. Working with human beings in training is something quite complex that requires preparation and solid knowledge. The child can no longer be seen as a miniature adult, the child is a unique being that has its own characteristics, its own knowledge that it has been building throughout its life. Thus, the
The work of constructing the first mathematical ideas will depend on the practical pedagogical ability of the
fessor as a mediator in the construction of knowledge.

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2. WHY IS IT IMPORTANT TO TEACH MATHEMATICS IN EARLY CHILDHOOD EDUCATION?

It is understood that mathematical knowledge contributes to the construction of citizenship. The fact that society is constantly changing requires greater knowledge associated with new technologies. In this way, education must provide the acquisition of knowledge that meets social changes,

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cultural and technological, meeting the needs and interests of individuals.

This is where the importance of Mathematics Education arises, which promotes the development of logic, speed of thinking and the ability to select information and use it for good individual and collective development. Mathematics favors the integral growth of man, giving him mechanisms so that he can move forward and be a builder of his story and not a passive being to everything and everyone. Given this, Carvalho (1994) reminds us of the following question:

> If we consider that knowledge must be constructed and that mathematical language must be acquired by the student, leading them to incorporate the meanings that the activities of manipulating teaching material or daily experience assume, then the sooner we start this construction, the more time we will have to enrich the topics covered, making them more comprehensive and complex, perhaps enabling the process of acquiring mathematical knowledge not to be interrupted as it usually happens (CARVALHO, 1994, p.20).

D'Ambrosio (2005) tells us that to deal and live with the reality of society, individuals seek explanations in the different ways of communicating. The teaching of mathematics makes great contributions, in this process of communication and in the development of multiple languages, it develops creativity and problem-solving skills in the individual and this knowledge is gradually adapted and improved.

The various works on education, including that of the Swiss psychologist Jean Piaget (1986-1980), consider that the first years of a child's life are very important for their physical, mental, emotional and social development. In his studies in the area of psychogenetics, he carried out experiments that highlighted four stages in logical development: Sensorimotor stage, which lasts from birth to around 24 months.

According to him, at this stage, the child goes through purely reflex activities to the formation of the first habits, then comes to coordination between vision and prehension (eyes and hands) in search of hidden objects, the practice of intentional acts, the differentiation of action schemes and problem solving through coordination.

After this stage comes the pre-operative stage, which lasts from 2 years to around 7 years. This phase, according to Piaget, begins with the appearance of language, which is a symbolic function. For Piaget, this is the stage that is most interesting in Early Childhood Education, where the child has opportunities to develop their potential.

Then comes the concrete operations stage, which goes from 7 years old to 11 years old. At this stage, the child is totally connected to real, concrete objects, but is already capable of moving from action to operation, which is an internalized action.

Soon after, comes the formal operations stage, which lasts from 11 to 15 years old. At this stage, logical reasoning appears where the child is already able to think using abstractions.

Piaget (apud NETO, 2001) emphasizes that "each stage serves as the basis for the next stage". In this sense, it is clear that Early Childhood Education is a fundamental stage in the school life of any citizen, without this foundation the student would certainly not have good results in their educational process.

The National Education Guidelines and Bases Law 9394/96 in its Article 29, is also very clear when it says: "Early Childhood Education, the first stage of basic education, aims at the integral development of the child up to six years of age, in its physical, psychological, intellectual and social aspects [...]" (LDB, 1996,). Bock(2000, p. 124)., tells us that:

> A child's learning begins long before they enter school, because from the first day of life, they are already exposed to the elements of culture and the presence of others, who become the mediator between them and culture. The child learns to speak and gesture, to name objects, to acquire information about the world around them [...]

When children enter school, they begin to live with people their own age, discovering, in their own way, new values and new experiences that enrich their lives. "This socialization gives you confidence in yourself, adaptability and intellectual performance. For many, the social interaction provided by school offers possibilities that the family is rarely able to provide" (BOCK, 2000, p. 124).

According to Dante (1996), "Early Childhood Education allows children to make many discoveries". For him, at this stage of human development, children are more anxious and curious, a suitable time to cement mathematical concepts, since they bring with them some Mathematics practices experienced in their daily lives.

Dante (1996) also gives us two basic reasons why Mathematics should be part of the preschool curriculum. The first is that it provides children with opportunities to develop logical reasoning, leading them to think logically and solve problem situations, stimulating their creativity.

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The second is that Mathematics is very useful for a child's daily life, as, unconsciously it is in permanent contact with shapes, magnitudes, numbers, measurements, counts, etc. Thus, Early Childhood Education, being a phase of discovery, is a favorable time to stimulate the development of logical mathematical thinking in children, working on practical aspects of their reality, favoring their intellectual development.

The Curricular Framework for Early Childhood Education shows us the importance of the Early Childhood Education stage. About the child he says that: "Like every human being, the child is a social and historical subject and is part of a family organization that is inserted in a society, with a certain culture, at a certain historical moment [...] " (RCNEI, 1998, p. 21).

Therefore, "children cognitively work with information from the most varied sources from a very early age" (FERREIRO, 2001, p. 99). Given this, it is important that they are in contact with the preschool world, so that, through prior information, the educator can mediate and facilitate their development for a more productive entry into Elementary School. Dante (1996) still maintains that,

> The child's good performance in the first grades and their consequent stay at school imply long and careful previous work on motor coordination, visual and auditory perception, verbal knowledge to communicate and express themselves, attention and ability to correctly follow instructions. , activities that develop logical thinking, recognition and representation of small quantities, group activities aimed at socialization and the development of hygiene and health habits[...] The purpose of preschool is, exactly, to provide conditions so that children, through guided activities, reach their maximum potential at this stage, becoming prepared, ready to enter primary school. (DANTE, 1996, p. 8)

Studies show us that the conception of children has undergone changes over time. There has been a long historical path of social changes until we reach the current conceptions about childhood. Aries (1978), shows us that:

> [...] the image of the child was seen (or not seen, as a miniature adult, worthless, with childhood denied, all that was needed was physical traits to appear and it was immediately mixed with adults, learning at that time was to help adults in their tasks, deprived of rights, infant mortality was seen as something natural, in addition, the child was perceived as a being without a soul, who did not think, which makes us think of a baby animal [...]

Today we have a new conception, a new perspective aimed at children. As the Curriculum Reference for Early Childhood Education – RCNEI highlights:

> Children have a unique nature, which characterizes them as beings who feel and think about the world in their own way. In the interactions they establish from an early age with the people close to them and the environment that surrounds them, children reveal their efforts to understand the world in which they live, the contradictory relationships they witness and, through play, explain the conditions of life to which their desires and desires are subjected. In the process of building knowledge, children use the most different languages and exercise their ability to have original ideas and hypotheses about what they seek to uncover. From this perspective, children build knowledge based on the interactions they establish with other people and the environment in which they live. (BRASIL, 1998, p.21-22)

Given this, we can understand the crucial role of the school as one of the human institutions responsible for much of the behavior and knowledge that children will have throughout their lives. Because the environment in which the individual is inserted provides various information that also establishes relationships with logical-mathematical knowledge.

Oliveira (1995) explains that for Vygotsky, the internalization of culturally produced sign systems expands cognitive development. Societies create systems of signs throughout history that modify and influence the social and cultural development of the individual, and this knowledge is shared by the entire community.

Therefore, the importance of stimulating Mathematics language in Early Childhood Education becomes visibly clear, in which doing is a necessary instrument for the child's progress, because when they do, build, feel fulfilled, enriched, they leave a challenging state for an uplifting state, starting to look at your creation with care and attention, being ready to talk about it with confidence and move forward with autonomy.

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FINAL CONSIDERATIONS

This study brought reflections and relevant knowledge about pedagogical practice in Early Childhood Education, as well as providing a comparison of legal theoretical aspects seeking to understand this universe of pedagogical practice in Mathematics teaching, which also involves the act of educating and caring.

The theoretical basis was fundamental to understanding the skills and responsibilities of an Early Childhood Education teacher. Through theories, one can learn about proposals and suggestions on how Mathematics teaching in Early Childhood Education should be and the entire dynamics of the teaching-learning process.

Thus, this work showed relevant factors on how to work with Mathematical ideas in Early Childhood Education, which must take into account the life experience accumulated by the child in interaction with their social environment, which offers conditions for the child himself to build their knowledge through direct contact with the object of study under the guidance of the teacher.

REFERENCES

ARIES, Philippe.**Child and family's social history**. Rio de Janeiro. LTC, 1978.

BRAZIL. Law No. 9,394, of December 26, 1996.**National Education Guidelines and Base Law**. Available at: <www.planalto.gov.br/ccivil_03/leis/L9394.htm>. Accessed in: December 2020.

_____.**National curriculum framework for early childhood education**. Introduction. Brasília: MEC/SEF, 1998. v.1 and v.3.

_____. Ministry of Education. Secretariat of Basic Education.**National Quality Parameters for Early Childhood Education.**Vol. 1 and 2. Brasília: MEC, SEB, 2006.

CARVALHO, Dione Lucchesi de.**Mathematics teaching methodology**. São Paulo: Cortez, 2nd edn, 1999.

DANTE, Luiz Roberto.**Mathematics Didactics in preschool:**why what and how to work on the first mathematical ideas. São Paulo. Editora Ática, 1996.

D'AMBROSIO, Ubiratan.**Ethnomathematics: Link between traditions and modernity**.Belo Horizonte: Autêntica, 2005.

_____.**From reality to action: reflections on education and mathematics**. São Paulo: Summus, 2002.

FERREIRO, Emília.**Reflections on literacy**. Collection of issues of our time. 24th ed. São Paulo: Cortez, 2001.

FREIRE, Paulo.**Pedagogy of autonomy: Knowledge necessary for educational practice**. São Paulo: Paz e Terra, 1996.

_____.**Education as a practice of freedom**.Rio de Janeiro: Peace and Earth.2005

_____.**Pedagogy of hope**: a reunion with the pedagogy of the oppressed. 4th ed. Rio de Janeiro: Peace and Land, 1997.

KAMII, C.J.**The child and the number**. Campinas: Papirus, 1990.

KISHIMOTO, TM (Org).**Game, toy, play and education**. São Paulo: Cortiz, 2000.

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KRAMER, Sonia.**Early Childhood Education Professionals**: management and training. São Paulo: Ática, 2005.

_____.**Pre-school policy in Brazil**: The art of disguise. 7th edition. São Paulo: Cortez, 2003.

NETO, Ernesto Rosa.**Mathematics Didactics**. 11. ed. São Paulo. Editora Ática, 2001.

OLIVEIRA, Zilma Ramos de.**Early childhood education: fundamentals and methods. Teaching collection in training**. São Paulo: Cortez, 2002.

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