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LEARNING IN THE 21ST CENTURY: THE DEVELOPMENT OF CRITICAL THINKING OF THE ALPHA GENERATION

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Abstract: The purpose of this article is to analyze and reflect on the learning process of Generation Alpha, also known as the digital natives. With the Digital Age and the intuitive use of new educational technologies by Generation Alpha, the social and interactive dimension has acquired particular relevance, making critical thinking a key skill for promoting learning in this new time. This article presents part of an intervention project applied to twelve students in the first year of elementary school at a private school in the interior of the state of São Paulo. The methodology was a descriptive case study with a qualitative approach and bibliographic design, using the tale of the fable “A Formiga e a Cigarra”(“ The Ant and the Cicada”). As a result, the importance of understanding the way in which the Alpha generation understands, interprets and appropriates information to build their own knowledge is highlighted. It was evident the relevance of learning achieved through critical thinking that promotes the child’s autonomy in the processes of search, selection, evaluation and use of information, in a conscious and reflective way, in their most different environments of formation and performance. It is concluded that the discussion of this theme is fundamental to rethink the evolution of the cognitive processes of the new generation regarding the production of knowledge when integrating the teaching and learning process with the new educational technologies.

Keywords: Learning; Educational Technologies; Alpha Generation; educational psychology.

INTRODUCTION

Digital Information and Communication Technologies (TDIC) have been causing rapid changes in society through the development of skills and the influence of behavioral patterns, which can be seen in the way

people are relating to each other, as well as in the academic, social spheres. and cultural (BAUMAN, 2007).

With the Technological Revolution, the TDICs began a stage of restructuring and adaptation to the new way for people to connect, relate and build knowledge (UNESCO, 2016). This way, the reality of the so-called digital natives in the 21st century is closely linked to the advances of TDIC and, in this sense, Lima (2012) states that:

(...) To live in an increasingly technological and connected world, that is, in a networked society, has important consequences, representing significant challenges for the processes of teaching and learning, both in formal and non-formal education contexts (LIMA , 2012, p.02).

Bordenave and Pereira (2002) emphasize that, in order to transform people’s reality, ideas and experiences must be shared. The authors state that when there is an exchange between communication and interpersonal relationships in the educational field, there is a favoring of a continuous learning process.

According to the National Curricular Common Base - BNCC (BRASIL, 2018), critical-scientific thinking can contribute to the learning process by encouraging students to use logic to understand phenomena. Active methodologies support the role of the student by contextualizing the plural realities of the environment in which he is inserted and in the use of different technologies (BACICH; MORAN, 2018).

Protagonism happens when students engage with culture and technology. Such knowledge, while influencing, also derives from the ability to exchange, thinking skills, reflection and acting on the information and knowledge available through globally connected networks (VILAÇA; ARAÚJO, 2016). In this context, we refer to the specifics of a generation: the Alpha.

Social researcher McCrindle (2014),

creator of the expression “Generation Alpha”, explains that children born after 2010 are totally immersed in technology. The behavior and cognition of the Alpha generation, also called digital natives, demonstrate that from an early age, these children interact in an intuitive environment, which influences the way they see, feel and think about the world in which they live (PRENSKI, 2001).

Bates (2019) states that the emergence of the knowledge society, composed of highly connected individuals, causes education to be rethought, as it was previously focused on the technical and scientific part. The author emphasizes the importance of aggregating the development of necessary skills and abilities, contributing for the formation to occur in the ethical sense, of interpersonal and intrapersonal relationships and of citizenship.

This new training, focusing on the relationships between individuals combined with the advancement of TDIC, can contribute to redesigning current society and its way of relating to the technological world, in an agile and practical way (SERGL; CUNHA, 2020)

Technologies are all creations made by man since the beginning, in order to communicate, to relate and guarantee their survival (LEVY, 2009). Man uses these languages to express himself and structure his thoughts, which evolve and change man and the world where he is inserted (VYGOTSKY, 2003a).

Talking about education is talking about the process by which human beings acquire information and knowledge (FREIRE, 2007), as well as skills and attitudes to develop in the exchange with the environment and in the socio-historical context in which they find themselves (VYGOTSKY, 2003b). This way, Prenski (2009) emphasizes that digital natives are individuals who interact and learn more easily with digital technologies than previous generations, called digital immigrants.

According to Ribeiro e Silva (2021),

integration and collaboration between immigrants and digital natives can bring significant results to the scientific and academic community, since the differences must be complementary, by combining the logical reasoning ability of the digital immigrant with the intuitive reasoning of the digital native.

The general objective of this work is to present a reflection on how educational technologies are building the critical thinking of the Alpha generation that is reading and interpreting the world in an eminently different way from previous generations.

EDUCATIONAL TECHNOLOGIES AND COGNITIVE ASPECTS

The presence of digital information and communication technologies (TDIC) in the school curriculum opens spaces to be used to bring the studied content closer to the students’ reality, as determined by the BNCC, by contributing to the student’s engagement in the construction of their own knowledge and to the innovation of pedagogical practices (BRASIL, 2017).

Technological advances emerge and, consequently, cause changes in society, in people’s daily lives and influence the learning of the 21st century, corroborating so that the student can develop specific and necessary skills and abilities to act in a world in constant transformation (KENSKI, 2012).

Education does not only happen in the physical space of the school, but in multiple spaces, including through educational technologies and the school feels challenged to create actions to integrate them into pedagogical practices (FAVA, 2012). The author states about the need to prepare the faculty to deal with the change in paradigms and, despite the obstacles and limitations, there is no denying that great steps have

already been taken.

The word technology is the result of the combination of two Greek words: “tekhne” which translates as the ability to signify, and “logos”, which means science (MURPHIE & POTTS, 2003). The concept of educational technology arises with technological innovations on the world stage, becoming a field that seeks to understand the pedagogical practice and the methodologies used allied to the construction of knowledge (CASTELLS, 2002).

Lévy (2000) considers the Internet as the digital revolution, capable of producing a new language, influencing the processes of communication and cognition of the human being, causing neurological and sensorial restructuring, affecting the way people relate, think and act. people (SANTANELLA, 2013). According to Moran (2000),

To educate is to collaborate so that teachers and students, in schools and organizations, transform their lives into permanent learning processes. It is to help students build their identity, their personal and professional path, their life project, in the development of comprehension, emotion and communication skills that allow them to find their personal, social and professional spaces and become fulfilled citizens. and productive (MORAN, 2000, p.57).

The idea of this new education is to move towards the development of transversal skills or abilities. In the 21st century, this transversality is essential so that digital natives, who are individuals who are strongly connected with technology, can complete their school education, with an integrative learning, seeking a new perspective of solution to real problems and situations (BACICH; MORAN, 2018).

For Tezani (2017), we live in a small and large world at the same time, woven by computer networks, in which the biggest challenge is to produce knowledge and carry

out a creative and critical management in the academic environment permeated by technology, in a responsible way, ethical and legal. According to Oliveira (2015),

In order for technological resources to be part of school life, students and teachers need to use them correctly, and a substantial component is the training and updating of teachers, so that technology is actually incorporated into the school curriculum, and not seen. only as an adjunct or marginal apparatus. It is necessary to think about how to incorporate it in the day to day of education in a definitive way. Next, it is necessary to take into account the construction of innovative content that uses the full potential of these technologies (OLIVEIRA, 2015, p. 81).

It is inevitable to realize that today's world is experiencing the great advance of technology. However, technology alone does not transform. Innovation comes from the ability to change old paradigms in the field of learning, transforming the student into an active agent in classes, providing a dialogic interaction with teachers (COSTA; RAMOS, 2020).

Psychology and Education are extremely fertile and promising fields of knowledge and intervention, which are consistent to understand the theoretical and methodological diversity that involves learning today (MOLON, 2002).

THE CRITICAL THINKING OF GENERATION ALPHA

When a new generation emerges, society feels the need to reinvent itself, including with regard to pedagogical practices in Basic Education and the challenges encountered in the coexistence of different generations (TEZANI, 2017). According to the author, for there to be harmony between generations, changes must take place not only in the classroom, but in the school environment as

a whole.

The term “generation” refers to a group of people born at a given time and who, because they grew up in the same cultural, social and economic context, share several characteristics in common (FURTADO, 2019). According to Viana et al (2013), generations used to be cut into historical periods, every 25 years. However, the advancement of technology has made such changes become faster and faster, and so today the duration of each generation has become shorter (JACQUES et al, 2015).

The Alpha generation sees technology as an integrated part of their lives, which makes them have new ways of relating, learning and experiencing the world around them (McCRINDLE, 2014). As they are inserted in an environment full of visual, sound and interactive stimuli since babies, these children are able to do more than one task at the same time and establish connections between different subjects.

Although Generation Z was also born in the Digital Age, the Alpha generation’s relationship with technology is much greater, as its use is intuitive, as they are exposed to a large volume of stimuli they receive from an early age, which will require teaching methods. dynamic, interactive and critical thinking skills (BACICH; MORAN, 2018).

Critical thinking is a form of complex logical reasoning in which the individual articulates information, experiences and intellectual skills in a reflective way through interpretation, being used in the educational field to deepen knowledge and obtain data on how to solve problems with autonomy and responsibility (JOHNSON, 2000).

The new learning process takes place from the students of the Alpha generation and their protagonism makes it possible for their talents to be presented. It is not enough to teach only about facts and technical content, but to create people with reflective thinking, capable of

working in community, in an interactive way, building new knowledge that collaborates for personal development, intervening in the collective and focused on the construction of citizenship.

The use of technology can impact children’s cognitive development such as memory, concentration, information search and thinking, which favors Basic Education (DANOVITCH, 2019). The author emphasizes that the first experiences with technology can form the basis for the development of competences.

Technology has become part of everyday life and children’s interaction time with screens has increased (SHARKINS et al, 2016). This way, education must enable the child to develop cognitively that favors the connection of information, so that knowledge is built from an interaction process (PIAGET, 1984).

For Vygotsky (1991), language development takes place through a constant interaction of internal dispositions with external conditions that will provide the stimuli for the child’s cognitive and social development. This way, the use of TDIC by the Alpha Generation favors learning through the development of collaboration, inclusion, critical thinking and problem solving (BRACHEN, 2015).

METHODOLOGY

This article is an excerpt of an intervention project entitled “*The ludic as an instrument for the psychosocial and emotional development in the second childhood (preoperative phase)*”, which was carried out with 12 students from the 1st year of elementary school, from a private education institution in the interior of the state of São Paulo. The target audience consisted of children of both sexes, aged between 05 and 06 years old. In the diagnostic research carried out with children, it was

verified that 100% use technological devices such as cell phones and tablets in their homes for fun and entertainment.

The research methodology was a descriptive case study, with a qualitative approach that took place through participant observation, as it allows the researcher to obtain data on the environment in which he will intervene, by allowing a view of the details and sequence of events to be observed. (GIL, 2009).

RESULTS AND DISCUSSION

Fifteen interventions were carried out with 12 students of the 1st year of Elementary School from a private school located in the interior of the state of São Paulo, which also had the presence of the teacher and the researcher at all times. At each intervention, the results referring to the objectives proposed in the activities were verified, with the aim of promoting critical-scientific thinking for the recognition of emotions, as well as promoting the self-esteem and socialization of the participating children. Of the fifteen interventions, two clippings were made, those that presented greater evidence on critical thinking and logical reasoning demonstrated by the children of the Alpha Generation. Following are the results of the two selected clippings:

1° CUTOOUT

In this intervention, the class teacher told the students the fable “The Cicada and the Ant”, by Jean de La Fontaine. Taking advantage of the opportunity, the researcher asked the children to identify some emotions in the story told and began to ask questions about understanding the story. Originally, the fable brings the moral that we must not think only about fun, because we must know the importance of work in the present and think about the future, preparing for the days of need (OLIVEIRA, 2017).

The children responded in an original and unusual way. When asked about their understanding of the story, if they really believed that Ant was working and Grasshopper was just having fun, the children replied that Ant was wrong. They justified it by saying that the Cicada was singing while the ants worked, but that the Cicada was not having fun: it was working. They explained using the words of the story that music made the ants happier and the work lighter. In short, the children said that Cicada was not having fun and said that being a musician is also a job, it is a profession. In other words, Cicada was working, not having fun.

Following the previous speech, the children said that when the Grasshopper asked the Ant what winter was and didn't get the answer, she had no idea what it meant and the implications that this season of the year would have on her life.

When asked about Formiga having denied food to Cicada, because she had not worked for it, the children replied that Formiga was very wrong, that there was no demonstration of friendship or solidarity on the part of Formiga (at snack time, the children children share their lunch with a colleague who has not brought it and thus, they learned about the meaning and practice of the words empathy and solidarity).

The children demonstrated critical thinking by doing a coherent, intelligent retelling from a new perspective of a famous and classic fable, which has always taught previous generations that only the ants worked while the cicada had fun singing and playing the guitar. They realized that the story was not about the importance of empathy and sharing with those who are in need. They pointed out that Cigarra had a profession: to be a musician, and that she was working and not doing “soft body”, as the moral of the story always taught.

La Fontaine (1989) explains that she used fables to denounce the injustices of the world and that such stories, which were previously written for the adult audience, were adapted for children aiming at the formative function. The author emphasizes that they must not be left in ignorance and the fables use animals, to which human beings are compared, to provide children with the notion between good and evil.

2° CUTOOUT

The proposed activity was to ask the children to teach the researcher what fear was in their view and to report what caused this feeling in them. They described that fear is something they feel in their belly or head, that this feeling seems to be something very big and dark. Most children said that they are afraid of the dark and that they need to sleep with a light on. Other fears mentioned were: fear of cockroaches, fear of butterfly. A summary of the history of Saci was told (LOBATO, 1975), as it was a time close to Folklore Day. The children said that Saci does not cause them any fear, and explained that despite him: *“to make jokes in very bad taste, it was not mean, because Saci is very mischievous”*. They also emphasized that the fact that he has only one leg does not frighten them because they have seen many people, including family members, with only one leg due to some health problem. When asked why Saci has only one leg, the children began to use their imagination and replied that the other leg was forgotten inside his mother’s belly, that his leg broke at birth or that it could be a spell. from Cuca.

According to Cascudo (2001), Saci is part of Brazilian folklore and its behavior portrays pranks in the woods and houses, in the act of scaring travelers, horses, hiding domestic objects and making noises. Despite this, the author clarifies that Saci was not intended to harm or do harm, but rather to have fun.

Vieira (2009, p. 112) states that:

Globalization, the emblem of modern society, has generated profound changes in technologies, in the media and in society as a whole, making the identities fixed in repertoires of goods exclusive to a local or national community unstable.

In this sense, Catenassi (2001) explains that popular culture does not have an end, but is subject to modification and reconstruction to interact with a new culture and society so connected to new educational technologies.

Technology changes the way individuals gather information, structure thoughts and produce knowledge. Given the impact caused by the use of DICT on people’s daily lives, there is an increase in social phenomena in the academic environment (COSTA; RAMOS, 2020).

During the application of the intervention, in addition to noting that the teacher still applies the traditional method of knowledge reproduction, a generational conflict was noticed because the children are presenting different responses from those usually provided by previous generations. The critical thinking of the Alpha generation is able to recognize problems, find ways to solve them, gather information to understand and use language with precision and clarity (RIBEIRO; SILVA, 2021).

When kids say that being a musician is not just fun, it’s a profession; when they say that the Formiga did not share the food with the Cicada and that Formiga lacked solidarity, Vitorino and De Lucca (2020), explain that practical skills must use everyday experiences to find, evaluate and use information generating ethical results, social and political. The authors also explain about the aesthetic sphere that employs sensitivity, creativity and harmony, so that the individual can re-signify information. There is also ethical competence, which refers to the responsible use of information, aiming

at the common well-being, and permeates the other dimensions. Therefore, the parts are interconnected, interrelated, as part of a gear, that is, from the general to the specific, to look again at the general.

Bock (2003) states that the human being begins to be studied from its relationship with the environment in which it is inserted, being a product and producer of this interaction. An important point to be observed by educators is to assume that the Alpha generation has an innate ability to use so many digital resources, being able to perform many tasks at the same time (PRENSKI, 2009).

In the knowledge society, there is a demand for the development of competencies that involve the ability to learn autonomously, strategically, responsibly, with a focus on critical thinking, communication skills and problem solving (BATES, 2017).

Digital natives demonstrate new behaviors and interests, which has been drawing the attention of teachers, parents and Educational Psychology professionals. This new generation of digital natives has a direct, active and, to a certain extent, uncontrollable behavior. This leads to a reflection on how to develop new approaches and teaching methods that manage to maintain students' focus, motivation and attention.

The digital natives, or *Homo zappiens*, spend a lot of time on technological devices, becoming an active information processor, developing new interpretation and synthesis strategies (VERAS, 2011). Because they are connected almost all the time, this new cognitive processing and modified the way of thinking of the *Homo zappiens*, that connects information in networks and in a more collaborative way.

This new generation of digital thinkers can do much more than what is expected of them, as they can be challenged to give new answers to complex problems to solve, in addition to

giving greater control over learning processes and how to develop their cognitive abilities.

When analyzing the points between the Industrial Revolution and the Digital Revolution, the individual is perceived as a key part in this process, showing that the evolution of technologies generate profound and significant transformations in the individual. The understanding of such subjective transformations shows a fertile field for Psychology to explore and understand the consequences in the new way of thinking, in human behavior with the advent of cyberculture and the impacts of this new language that are influencing social relations in this new environment.

Reflection on the educational transformations that have taken place in recent decades is of great value not only as a diagnosis, but also as a prognosis. In this perspective about studies involving the cultural-historical theory, it is essential to understand the constitution of the human psyche, the organization of thought and the elaboration/construction of knowledge to deal with a subject as rich as it is complex, not leaving to consider the multiple character of the socio-historical intersections that the process involves.

The school develops pedagogical mediations that allow subjects to come into contact with knowledge and, consequently, develop their superior psychological functions (BOCK, 2003). The author confirms that education has the intention of direct and intentional to mediate the apprehension of the knowledge developed in the historical development.

Understanding the socio-historical moment is relevant to help students develop their cognitive critical thinking skills, becoming able to collect, select and use information to face the situations they face (MARTINS, 2013).

Educational Psychology, through the

historical-cultural view, proposes to explain the mental and cognitive characteristics of the individual, in order to unveil the human mind in its process of evolution and in its relationship with the world. According to Rosseto et al (2021), Educational Psychology can enhance educational practices, corroborating the role of the school, aiming at teaching and training the subject as a reflective citizen capable of understanding the changes in social and educational relationships.

FINAL CONSIDERATIONS

The research results showed uncertainties that permeate pedagogical practices involving educational technologies in learning processes and highlight the differences in the exchange between natives and digital immigrants.

The learning process is not something static because it is a product of the human being, which is also in constant construction and evolution. The transformation in the educational sphere, as one of the consequences of the Technological Revolution, requires a thorough restructuring in several areas, including the educational sphere.

The behavior and cognition of the Alpha generation translates the new knowledge society, as these children learn from an early age in an intuitive environment that influences their way of seeing, feeling and thinking about the world in which they live. This generation so connected with digital technology makes education rethink, in favor of a formation of values that favor critical-scientific thinking, the ethical sense and relationships, in favor of the integral formation of the student in the cultural and socio-historical context.

Technology will not be able to transcend traditional teaching methods. Between technology and methods there is the human being. TDICs are able to broaden horizons, but the role of students can enhance learning, by developing relevant skills such as reflective

thinking and building new knowledge that collaborates for personal and collective development.

Educational Psychology finds a fertile space to be explored in relation to human development through the behavior of the Alpha generation. Innovation and speed are part of the lives of these individuals, resulting in the production of knowledge to understand the significant and subjective changes that have been taking place in the society in which they live.

In conclusion, it is possible to verify that the new technologies are creating not only a new culture, but a new model of society. This way, the scientific community's commitment to education and psychology encourages the creation of cultures of convergence in the classroom and in social relationships. That teachers are contemporary professionals to encourage their students to build their own knowledge through self-directed and interdisciplinary learning, preparing the Alpha generation to use critical thinking when reading the phenomena of the world around them.

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