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Education: Maker culture and active methodologies

Educação: Cultura maker e as metodologias ativas

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ABSTRACT

This article discusses the construction of knowledge from the perspective of maker culture, highlighting the role of active methodologies in youth protagonism. Initially, the principle of meaningful learning is addressed, which emphasizes the incorporation of new concepts into students' prior knowledge. Next, the Brazilian legislation related to education is presented, highlighting the role of the State and the family in promoting the full development of young people. The text also discusses the evolution of pedagogical practices, moving from Traditional Pedagogy to active methodologies, which place the student as the protagonist of the learning process. The National Common Curriculum Base (BNCC) is mentioned as an important reference for the implementation of these approaches. Finally, some of the most effective active methodologies are presented, such as project-based learning, flipped classroom, cooperative learning, and blended learning, highlighting their relevance for 21st century skills development and for promoting more meaningful and inclusive education.

Keywords: Maker culture, Active methodologies, Youth protagonism.

INTRODUCTION

In recent years, there has been a growing appreciation of active learning and youth protagonism in the educational context. The search for methods that stimulate the active participation of students in the teaching and learning process has led to a reassessment of traditional pedagogical practices, giving way to innovative approaches, such as maker culture and active methodologies.

In this scenario, knowledge construction gains prominence as a dynamic and collaborative process, in which students are encouraged to explore, experiment and create in a

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meaningful and relevant learning environment. This article aims to discuss the importance of knowledge construction from the perspective of maker culture and active methodologies, highlighting the role of youth protagonism in the educational process.

To this end, key concepts related to meaningful learning, Brazilian legislation on education, the evolution of pedagogical practices and the most effective active methodologies will be addressed, as well as the contribution of the National Common Curricular Base (BNCC) and the New High School to the promotion of these innovative approaches.

Finally, it is intended to demonstrate how the integration of these approaches can contribute to the formation of critical, autonomous citizens capable of facing the challenges of the 21st century, promoting a more inclusive, democratic and transformative education.

KNOWLEDGE CONSTRUCTION FROM THE PERSPECTIVE OF MAKER CULTURE

One of the key principles of meaningful learning is the construction of knowledge. This implies that the new concepts are incorporated into the prior knowledge of learning, creating relevant connections. With the maker culture methodology, individuals often start projects based on personal interests and previous experiences. In doing so, they naturally build on what they already know, applying that knowledge to solve real problems and create tangible solutions.

Education is a fundamental right shared between the State, family, and society, as recognized by the Federal Constitution of Brazil. Families and the State have the duty to educate their children, young people and adolescents, promoting and encouraging them with the collaboration of the community, with the objective of achieving the full development of the person, preparing them for the exercise of citizenship and qualifying them for work (Brasil, 1988).

The preparation of a person for the exercise of citizenship involves a whole process of human and academic formation. This training process, throughout history, has been measured by traditional pedagogy aiming at the insertion of the individual, in a passive way, in the labor market. Nowadays, pedagogy has sought to modernize and adapt to active methodologies. According to Bacich and Moran (2017), Active Methodologies are pedagogical alternatives that focus on the learner during the teaching and learning process, involving them in learning by discovery, research, and problem solving.

The BNCC (2018), working on the idea of developing learning based on competencies and skills, from the perspective of an education along the lines of the maker culture, seeks to

value and use the knowledge that has been built over the years about the digital, social, cultural and physical world to understand and explain reality, in addition to continuing to learn and collaborate to build a just society, democratic and inclusive.

When considering the flexibility of the curriculum for the New High School, the BNCC (2018) considers it important to create collaborative pedagogical alternatives with an emphasis on the interest of students and favor youth protagonism, articulated through areas of knowledge such as: laboratories, workshops, clubs, observatories, incubators, study centers, artistic creation centers.

In Duarte's conception; Sanches; According to Dedini (2017), the main objective of maker culture, as active pedagogical principles, is "do it yourself" through the use of technological tools such as arduino boards (platform for creating electronic projects), 3D printers, laser cutters, robotics kits, prototyping, own manufacturing of products or solutions. The maker approach aims to improve communication, the ability to express oneself and the development of social skills, group work, creativity and the use of technology. The use of free hardware and software in conjunction with this active learning approach promoted by the maker culture can change the way students learn, making them protagonists of the educational process and promoting exploration, experimentation and innovation (Castilho; Borges; Fagundes, 2018).

The BNCC itself brings in its competencies and skills the perspective of the development of youth protagonism. Protagonism in the educational sphere is the mechanism granted to the student to develop their ability to act and take responsibility through personal choice and creating their own life project with autonomy, responsibility, resilience in their social practice in the exercise of citizenship.

This educational model meets the principles of education 4.0, in which, in the face of the needs of technological advancement, "this teaching approach seeks to create autonomous students, capable of facing complex and uncertain challenges, and who are creative and collaborative in their approach to solving problems and acquiring new knowledge" (Martins, 2023, p. 4). In this teaching perspective, the educator plays the role of learning facilitator, assisting students in the construction of knowledge through the organization of information acquired with experience in active practices for life in a society in constant transformation.

In this learning process, the social experience consists of open learning exchanges and meaningful problem-solving, with sharing of ideas, testing and evaluation of concepts, mutual learning, exchange of roles between participants, and different levels of experience in different topics.

Thus, it rescues the concept of competence developed by the BNCC, in which "objects of knowledge" and "skills" must be developed. While maker culture in education can be defined as the ideas that are expected to be cultivated when participating in didactic activities in the classroom, where teachers and students are expected to collaborate in the action of teaching and learning. As a result, practice and experimentation are the means by which learning is learning in maker culture.

Creators are encouraged to promote their work, collaborate with other artists, and gain input from their community. By creating prototypes and projects, creators can explore their passions and interests and solve real-world problems (Gondim, 2023). With this pedagogical form of teaching, the student is more stimulated with the creative and developing principle, becoming the protagonist of his learning and taking responsibility for the formation of citizenship.

Maker Culture is an approach that emphasizes learning through creation, exploration, and experimentation. It encourages students to become active creators and problem solvers, rather than mere consumers of knowledge. In maker environments, students have the opportunity to design, prototype, and build tangible things such as robots, electronic devices, physical artifacts, and more. Maker Culture fosters autonomy, curiosity, collaboration, and problem-solving, which are valuable skills in the real world.

ACTIVE LEARNING METHODOLOGIES

Active Methodologies are pedagogical approaches that put the student at the center of the learning process. They encourage students' active participation, critical reflection, and collaborative knowledge building. Examples of Active Methodologies include project-based learning, flipped classroom, peer teaching, and more. The goal is to create a dynamic and engaging learning environment where students are motivated to explore, question, and apply concepts.

Despite technological and scientific advances, the traditional class format still prevails, centered on oral and written communication, using conventional resources such as a blackboard, notebook, and pen. Although there is some incorporation of audio-visual aids such as films, videos, and graphic presentations, students continue to play a passive role in absorbing knowledge. Daros (2018) argues for the need for changes in this scenario, aiming at a greater integration of content with the students' experience and promoting a more participatory learning approach. It also stresses that innovation plays a crucial role in this process, highlighting the

importance of creativity and the formulation of new ideas. However, it emphasizes the need for intentionality behind each educational strategy, emphasizing the importance of meticulous planning and consideration of the various factors that contribute to an innovative process.

This paper does not advocate for the abolition of conventional teaching methodologies, but rather for the incorporation of approaches that break the student's passivity and promote their active participation in the construction of knowledge, known as active methodologies. In Moran's (2017) conception, methodology is understood as the broad guidelines that guide the teaching and learning processes and are manifested in specific and differentiated strategies, approaches, and techniques. Active methodologies, on the other hand, are those that encourage the participation of students in the elaboration of their own knowledge, thus requiring the development of skills and competencies necessary for the acquisition of knowledge.

It represents, therefore, a change of perspective, where the student is no longer seen only as a passive receiver of information transmitted by the teacher, but rather as someone who, through active learning strategies, is able to construct their own knowledge, giving it meaning, relating it to their reality and applying it to solve daily challenges, whether at school, at work, at home or in the practice of citizenship.

The real effectiveness of the paradigm shift depends on the collective effort led by the faculty, followed by the interest of the students and the support of the school community, as the process is carried out throughout the pedagogical action, involving strategies, planning, experimentation and acquired results. Among so many methodological forms that present excellent results in proactive learning practices, the following are referenced: Problem-Based Learning; Flipped Classroom; Cooperative Learning; Problematization; Peer Instruction; Meaningful Learning; gamification, etc.

The use of a more multifaceted teaching mechanism also requires adjustments in the political will and pedagogical practice, setting the physical space that directly takes place in learning, in order to enable the realization of activities in a network. According to Moran (2015), in this context of a more student-oriented approach and dynamics in the teaching process, it is necessary to restructure the physical space of classrooms and the school environment in general. It entails creating versatile classrooms that can easily accommodate group, plenary, and individual activities. In addition, it is essential that environments are equipped with wireless networks to allow the use of mobile technologies, requiring adequate bandwidth to support multiple simultaneous connections.

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YOUTH PROTAGONISM THROUGH ACTIVE METHODOLOGIES

Youth protagonism is a pedagogical approach present in the proposal of the New High School in Brazil that places students at the center of the learning process, making them active protagonists of their own educational development. This concept highlights the importance of involving young people not only as passive recipients of knowledge, but as active agents in the construction of knowledge. In this context, active methodologies emerge as powerful tools to promote youth protagonism, aligning with the principles of the National Common Curriculum Base (2017) and the New High School.

Active methodologies are teaching strategies that encourage the active participation of students in the learning process. Unlike traditional approaches, where the teacher is the main transmitter of knowledge, in active methodologies, students are encouraged to explore, question, collaborate, and create, developing essential skills for the 21st century, such as critical thinking, communication, collaboration, and creativity. Some of the most effective active methodologies to promote youth protagonism and aligned with the BNCC (2017) and the New High School include: a) Project-Based Learning in which students work on projects that address real-world issues, allowing them to investigate, collaborate, and create meaningful solutions to real problems; b) The Flipped Classroom in which students take responsibility for their own learning, reviewing the content at home through materials prepared by the teacher and dedicating time in the classroom to practical activities, discussions and clarification of doubts; c) Cooperative Learning, enabling group work to achieve common goals, promoting collaboration, effective communication and the development of social skills; d) Blended Learning combines elements of face-to-face and online teaching, offering students the flexibility and autonomy to learn at their own pace and style, while maintaining interaction with the teacher and peers.

In short, youth protagonism through active methodologies is essential for student engagement, the development of 21st century skills and the promotion of meaningful and relevant education, in accordance with the principles of the BNCC and the New High School. By adopting pedagogical approaches that place students at the center of the learning process, educators can empower young people to become active agents in the construction of their own knowledge, preparing them to face the challenges of the contemporary world and contributing to a more just and inclusive society.

CONCLUSION

The adoption of maker culture and active methodologies represents a revolution in the educational field, promoting more meaningful and student-centered learning. By placing students as the protagonists of their own learning, these approaches encourage the development of essential skills for the 21st century, such as creativity, critical thinking, and collaboration.

The BNCC and the New High School recognize the importance of these methodologies, aligning themselves with the demands of the contemporary world. By providing spaces for experimentation and creation, education becomes more inclusive and transformative.

It is worth noting that educators play a key role in inspiring and empowering young people to become active agents in the construction of knowledge. In short, maker culture and active methodologies have the potential to prepare students for the challenges of the future, contributing to a more just, democratic and progressive society.

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