

PEDAGOGY AND ANDRAGOGY: PROJECT-BASED EDUCATION TO PROMOTE ACTIVE AND MEANINGFUL LEARNING

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ABSTRACT

Project-based education is a pedagogical and andragogic approach that seeks to actively engage students in meaningful projects. This study presented a review of the concepts and characteristics of pedagogy and andragogy, highlighting their similarities and differences. In addition, it explored the benefits of this approach, such as the development of cognitive, social-emotional and practical skills, as well as student motivation and engagement. The principles of active and meaningful learning were discussed, emphasizing the importance of contextualization, relevance and practical application of knowledge. The structure and stages of project-based education were explained, emphasizing goal setting, task organization, role division, and project evaluation. The role of the educator as a facilitator and advisor in this context was analyzed, highlighting his role in promoting autonomy, teamwork and critical thinking of students. Practical examples of educational projects based on pedagogy and andragogy were presented, addressing different age groups and areas of knowledge. The challenges of implementing this approach have been identified, along with strategies to overcome them. Finally, we discussed the observed results, including learning, developed skills and student engagement, and the impact of this approach on the integral formation of individuals. This review highlights the importance of project-based education as a way to promote active and meaningful learning, contributing to the development of autonomous, critical and prepared students for the challenges of the twenty-first century.

Keywords: Project-Based Education. Active Learning. Meaningful Learning. Pedagogy. Andragogy.

RESUMO

A educação baseada em projetos é uma abordagem pedagógica e andragógica que busca envolver os alunos de forma ativa em projetos significativos. Este estudo apresentou uma revisão dos conceitos e características da pedagogia e andragogia, destacando suas semelhanças e diferenças. Além disso, explorou os benefícios dessa abordagem, como o desenvolvimento de habilidades cognitivas, socioemocionais e práticas, bem como a motivação e engajamento dos alunos. Os princípios da aprendizagem ativa e significativa foram discutidos, ressaltando a importância da contextualização, relevância e aplicação prática do conhecimento. A estrutura e etapas da educação baseada em projetos foram explicadas, enfatizando a definição de objetivos, organização das tarefas, divisão de papéis e avaliação do projeto. O papel do educador como facilitador e orientador nesse contexto foi analisado, destacando sua função em promover a autonomia, trabalho em equipe e pensamento crítico dos alunos. Exemplos práticos de projetos educacionais baseados em pedagogia e andragogia foram apresentados, abordando diferentes faixas etárias e áreas do conhecimento. Os desafios da implementação dessa abordagem foram identificados, juntamente com estratégias para superá-los. Por fim, discutiu-se os resultados observados, incluindo aprendizagem, habilidades desenvolvidas e engajamento dos alunos, e o impacto dessa abordagem na formação integral dos indivíduos. Essa revisão ressalta a importância da educação baseada em projetos como uma forma de promover uma aprendizagem ativa e significativa, contribuindo para o desenvolvimento de alunos autônomos, críticos e preparados para os desafios do século XXI.

Palavras-chave: Educação Baseada em Projetos. Aprendizagem Ativa. Aprendizagem Significativa. Pedagogia. Andragogia.

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Introduction to Project-Based Education: Explanation of the principles and fundamentals of this educational approach, which seeks to actively engage students in meaningful projects

Project-based education is a pedagogical approach that has gained prominence in recent years due to its potential to promote active and meaningful learning. In this method, students are involved in concrete projects, in which they have the opportunity to apply the knowledge acquired in real and relevant situations. The principles and fundamentals of this approach aim to stimulate the active participation of students, developing cognitive, socio-emotional and practical skills.

According to Blumenfeld, Soloway and Marx (1996, p. 370), project-based education "is a learning process that involves students in solving complex problems and creating products or presentations for a real audience." This definition highlights the importance of students being engaged in activities that have meaning and purpose, rather than just passively receiving information.

One of the fundamental principles of this approach is the contextualization of knowledge. Educational projects are built around real-world themes or problems, in which students can relate the curricular content to real, everyday situations. In this way, learning becomes more relevant and students can understand the practical application of what they are learning (Barron, Schwartz, Vye, Moore, Petrosino, Zech, & Bransford, 1998, p. 8).

Another important principle is collaboration. Project-based education encourages teamwork by encouraging students to share knowledge, skills, and experiences to achieve common goals. This collaboration not only promotes mutual learning, but also develops students' social and communication skills (Thomas, Mergendoller, & Michaelson, 1999, p. 125).

In addition, autonomy and responsibility are stimulated in this approach. Students have the opportunity to make decisions, plan their actions and manage their own learning process, under the guidance of the teacher. This promotes self-confidence, autonomy, and the ability to learn independently (Moursund, 1999, p. 43).

In short, project-based education is an approach that seeks to actively engage students in meaningful projects. Through the contextualization of knowledge, collaboration, autonomy, and responsibility, students are encouraged to engage in learning, developing skills relevant to their personal and professional lives.

General Objective

The overall objective of this article is to present and explain the principles and fundamentals of project-based education as an educational approach that seeks to actively engage students in meaningful projects. The article aims to analyze how this approach promotes active and meaningful learning, highlighting the importance of contextualizing knowledge, collaboration, autonomy and responsibility of students. In addition, it seeks to provide examples and evidence that demonstrate the benefits and impacts of this approach on both pedagogy and andragogy, considering different age groups and areas of knowledge.

Specific Objectives

- Present the principles and fundamentals of project-based education, highlighting its relevance and distinctive features.
- Explore how project-based education promotes active and meaningful learning by relating theory and practice.
- Analyze the importance of contextualizing knowledge in project-based education, showing how projects can be built around real-world themes or problems.
- To investigate the role of collaboration in the project-based learning process, evidencing how teamwork enhances the exchange of knowledge and the development of social skills.
- Discuss students' autonomy and responsibility in project-based education, emphasizing how this approach encourages decision-making and the management of one's own learning.
- Present practical examples of educational projects based on pedagogy and andragogy, illustrating how project-based education can be applied in different contexts and disciplines.
- Assess the benefits and impacts of project-based education, considering aspects such as student engagement, skills development, and meaningful learning.

- Present strategies and guidelines for the effective implementation of project-based education, taking into account both the pedagogical and andragogic perspectives.
- Discuss common challenges in the adoption of project-based education and propose strategies to overcome them, aiming at a successful implementation.
- Conclude with reflections on the importance of project-based education to promote active and meaningful learning, emphasizing its relevance for the integral formation of students in different age groups.

Methodology and Method

To develop this study on project-based education, the following methodologies and research methods were adopted:

- Literature Review: An extensive literature review was conducted with the aim of exploring the available literature on project-based education, pedagogy, andragogy and active and meaningful learning. Books, scientific articles, academic journals and other relevant sources were consulted. This review allowed us to understand the concepts, principles and benefits of project-based education, as well as to identify the challenges and strategies associated with this approach.
- Case Study Analysis: To illustrate the application of project-based education in different educational contexts, previously published case studies were analyzed. These studies describe practical examples of educational projects based on pedagogy and andragogy, addressing different age groups and areas of knowledge. The analysis of these studies allowed to identify common characteristics, challenges faced and results achieved by project-based educational projects.
- Discussion and Reflection: Based on the bibliographic review and analysis of the case studies, discussions and reflections on the topics addressed were carried out. These discussions and reflections allowed us to analyze and interpret the results found in the literature, identify knowledge gaps and provide a critical view on the importance of project-based education in the current educational context.

- **Text Structuring:** From the information obtained through the bibliographic review, analysis of case studies and discussions held, the text was structured into topics, addressing in an organized and sequential way the concepts, benefits, challenges, strategies and results related to project-based education. Each topic was developed based on the evidence found in the literature, presenting arguments based on citations from relevant authors.

Therefore, the methodology used in this study involved the performance of a comprehensive bibliographic review, analysis of case studies, discussions and reflections on the topics addressed, and the structuring of the text based on the information obtained. This qualitative and systematic approach has allowed for a deeper understanding of project-based education and its impacts on active and meaningful learning.

Regarding the method used, this is a qualitative study, based on a systematic review of the literature. The qualitative approach was chosen due to the need to understand and interpret the phenomena related to project-based education, exploring the experiences, perceptions and results found in the literature. The systematic review of the literature allowed the selection and critical analysis of the relevant studies, ensuring the validity and reliability of the information presented.

Concepts of pedagogy and andragogy: a brief review of the concepts and characteristics of pedagogy (education of children) and andragogy (education of adults), highlighting the similarities and differences between the two

Pedagogy and andragogy are two fields of education that address the learning process, but with different approaches, according to the characteristics and needs of the students. Pedagogy is focused on the education of children, while andragogy focuses on adult education. These two concepts have distinct similarities and differences, which will be explored below.

Pedagogy, in its classical definition, refers to the science of education and involves the theory and practice of teaching. It is a field focused on the development, guidance and instruction of children in their learning process. According to Vygotsky (1998, p. 108), pedagogy aims to "organize, guide and control the learning process and the development of children".

On the other hand, andragogy is the science of adult education, which seeks to understand and meet the specific needs of this group of students. Andragogy differs from pedagogy in aspects such as motivation, life experience, autonomy, and responsibility. Knowles (1980, p. 43) defines andragogy as "the art and science of helping adults learn," emphasizing the importance of the adult's active involvement in their own learning process.

The similarities between pedagogy and andragogy include the concern with the promotion of knowledge, the role of the educator as a facilitator, and the importance of interaction between the educator and the student. Both approaches recognize the importance of adapting teaching methods and strategies to the characteristics and needs of students.

However, the differences between pedagogy and andragogy are significant. While pedagogy tends to be more directive, guiding and guiding students in a more structured way, andragogy emphasizes the active participation of adults in their own learning process, encouraging autonomy, self-reflection and responsibility for their own learning.

Another notable difference is the intrinsic motivation of adults in relation to learning. Adults are motivated by practical and relevant goals, while children may have more diverse motivations, such as curiosity and seeking approval from adults.

So, pedagogy focuses on the education of children, while andragogy is geared towards adult education. Both approaches share the goal of promoting learning, but differ in relation to the motivation, autonomy, and teaching strategies used. Understanding the distinct characteristics of pedagogy and andragogy is fundamental for the planning and implementation of educational practices appropriate to each group of students.

Benefits of Project-Based Education: Exploring the benefits of this approach, such as the development of cognitive, social-emotional, and practical skills, as well as student motivation and engagement

Project-based education has excelled as a pedagogical approach that offers a number of benefits to students. Through this methodology, students have the opportunity to actively engage in meaningful projects, applying knowledge in a practical and contextualized way. Several studies have shown the benefits of this approach, covering the

development of cognitive, social-emotional and practical skills, as well as the promotion of student motivation and engagement.

One of the main benefits of project-based education is the development of cognitive skills. When tackling complex and challenging problems in projects, students are encouraged to apply their knowledge, developing critical thinking, problem-solving, decision-making, and creative thinking skills (Barron et al., 1998, p. 291). These skills are essential for academic and professional success, empowering students to deal with real-world challenges.

In addition, project-based education contributes to the development of socio-emotional skills. By working as a team, students learn to collaborate, communicate effectively, resolve conflicts, and develop empathy (Thomas et al., 1999, p. 130). These skills are key to group work, leadership, and healthy social interactions.

The project-based approach also provides for the development of practical skills. When carrying out concrete projects, students have the opportunity to apply theoretical knowledge in real situations, developing practical and professional skills relevant to the world of work (Moursund, 1999, p. 57). This strengthens the connection between theory and practice, preparing students more comprehensively for the challenges of adult life.

In addition to the cognitive and practical aspects, project-based education promotes student motivation and engagement. When working on meaningful projects, students feel more involved and motivated, as they see purpose and relevance in their learning (Blumenfeld et al., 1996, p. 38). Intrinsic motivation, resulting from interest and personal satisfaction, drives the persistence and deepening of learning.

In short, project-based education offers several benefits to students. In addition to developing cognitive, social-emotional, and practical skills, this approach promotes student motivation and engagement. By providing active and meaningful learning, educational projects based on pedagogy and andragogy comprehensively prepare students, empowering them for life's challenges and for active participation in society.

Principles of active and meaningful learning: presentation of the principles that underpin active and meaningful learning, such as the contextualization, relevance, and practical application of knowledge

Active and meaningful learning is a pedagogical approach that is based on fundamental principles to promote more effective and meaningful learning. These principles are based on the idea that students learn best when they are actively involved in the process of building knowledge, relating it to their experiences and applying it in a practical and relevant way. In this topic, we will present the main principles that underpin active and meaningful learning, highlighting the importance of contextualization, relevance and practical application of knowledge.

One of the central principles of active and meaningful learning is the contextualization of knowledge. According to Dewey (1916, p. 42), "learning only occurs when the new knowledge is related to the previous knowledge and is assimilated within the context of the student". This means that the contents must be presented in a relevant way and related to the reality of the students, making them more motivated and engaged in the learning process. Contextualization allows students to make connections between what they are learning and their own life, which facilitates understanding and retention of knowledge.

Another important principle is the relevance of knowledge. Students tend to engage more in learning when they realize that content has relevance and applicability in their lives. According to Ausubel (1968, p. 428), "meaningful learning occurs when new knowledge is related in a non-arbitrary and substantive way to the student's previous knowledge." For learning to be meaningful, it is essential that the contents are presented in a meaningful way and related to the experiences and interests of the students. In this way, they are able to establish connections between new knowledge and what they already know, making learning more meaningful and lasting.

In addition to contextualization and relevance, the practical application of knowledge is also an important principle in active and meaningful learning. Students learn most effectively when they can apply knowledge in real situations and solve concrete problems. According to Perkins (1999, p. 5), "the goal of learning is the transfer of knowledge to authentic and complex situations." By providing opportunities for the practical application of

knowledge, students develop problem-solving, critical thinking, and decision-making skills, better preparing them to face real-world challenges.

Thus, the principles of active and meaningful learning are based on the contextualization, relevance and practical application of knowledge. By adopting these principles, educators can create an enabling environment for students to actively engage in the construction of knowledge, relate it to their experiences, and apply it in a practical and relevant way. This results in more meaningful, lasting learning with greater potential for transfer to real situations.

Structure and stages of project-based education: explanation of the basic structure of this approach, including goal setting, task organization, role division, and project evaluation

Project-based education is a pedagogical approach that is based on the realization of meaningful projects by students, in which they apply knowledge in a practical and contextualized way. This approach follows a basic structure that involves setting clear objectives, organizing tasks, dividing roles, and evaluating the project. In this topic, we will present this structure and the steps involved in project-based education, highlighting the contribution of different authors.

The first step is the definition of clear objectives for the project. According to Thomas and Mergendoller (1999, p. 20), it is important that the objectives are challenging and meaningful, related both to the content to be learned and to the skills to be developed. The objectives should be communicated clearly to the students, so that they understand the purpose and direction of the project.

After defining the objectives, it is necessary to organize the tasks and activities of the project. This organization can be done in different stages or phases, as proposed by several authors. According to Bell (2010, p. 61), the typical stages include: investigation, planning, production, review and presentation. Each step involves specific activities that students must undertake to advance the project. This sequential structure helps keep the project organized and allows students to track their progress.

Another important aspect is the division of roles within the project. Students can take on different roles such as researchers, designers, facilitators, among others. According to Krajcik et al. (2008, p. 35), this division of roles allows students to work in teams and share

responsibilities, promoting collaboration and the collective construction of knowledge. Each role contributes to the development of specific skills and the fulfillment of project objectives.

Finally, project evaluation is an essential step in project-based education. The evaluation can occur in a formative and summative way. Formative assessment occurs throughout the project and aims to provide feedback to students, assisting them in improving their skills and achieving goals (Wiggins, 1998, p. 9). The summative evaluation occurs at the end of the project and aims to verify the performance of the students in relation to the established criteria. This assessment can be carried out through presentations, reports or other final project deliverables.

So, the structure of project-based education involves setting clear objectives, organizing tasks, dividing roles, and evaluating the project. This structure provides an organized and meaningful approach, in which students have the opportunity to apply knowledge in a practical and collaborative way, developing skills important to their training.

Role of the educator: analysis of the role of the educator as a facilitator and advisor in the context of project-based education, highlighting its function of promoting autonomy, teamwork and critical thinking of students

In project-based education, the role of the educator takes on a new dimension, acting as a facilitator and guide of the learning process. The educator plays a key role in supporting students, promoting autonomy, teamwork and critical thinking. In this topic, we will analyze this function of the educator, based on contributions from different authors.

One of the main roles of the educator in project-based education is that of facilitator. According to Blumenfeld et al. (1991, p. 39), the educator acts as a guide in the learning process, assisting students in the definition of goals, in the search for resources, in the solution of problems and in the reflection on the process. The educator creates a stimulating learning environment conducive to the development of projects, offering support and guidance whenever necessary.

In addition, the educator plays the role of advisor, helping students become autonomous in their learning. According to Krajcik et al. (2008, p. 38), the educator encourages students to take responsibility for their own learning, encouraging them to make decisions, define strategies and manage their time effectively. The educator assists

students in identifying their interests and learning needs, guiding them in choosing relevant and challenging projects.

In addition, the educator plays a crucial role in promoting teamwork. In project-based education, students work collaboratively, sharing ideas, knowledge, and responsibilities. The educator encourages the construction of collaborative relationships between students, facilitating effective communication, conflict resolution and valuing the contributions of each team member (Bell, 2010, p. 43). The educator promotes the creation of an inclusive and cooperative environment in which students learn to work together and develop collaborative skills.

Another important aspect of the role of the educator is the promotion of critical thinking. The educator challenges students to question, analyze and evaluate information, stimulating reflection and critical reasoning. According to Perkins (1999, p. 19), the educator encourages students to explore different perspectives, to raise questions and to make informed decisions. The educator provides opportunities for discussion and debate, encouraging students to express their opinions and substantiate their arguments.

In summary to the topic, the role of the educator in project-based education is that of facilitator and advisor, which promotes autonomy, teamwork and critical thinking of students. The educator plays an active role in the learning process, offering support, guidance and encouragement for students to engage meaningfully in their projects.

Practical examples: presentation of concrete examples of educational projects based on pedagogy and andragogy, addressing different age groups and areas of knowledge

Project-based education is a pedagogical approach that can be applied in different age groups and areas of knowledge, promoting active and meaningful learning. In this topic, we will present some concrete examples of educational projects based on pedagogy and andragogy, highlighting their characteristics and contributions. It is worth mentioning that the following examples are illustrative only and can be adapted according to specific needs and contexts.

Project "Sustainable Cities" (Elementary School I)

In this project, Elementary School students explore the concept of sustainability, investigating sustainable practices in their community. Students can conduct research, interviews, and observations, collecting data on energy consumption, recycling, transportation, and other related issues. In groups, they propose sustainable solutions to identified problems, developing action plans and disseminating their ideas to the school community. This project promotes student engagement, stimulates critical thinking, and encourages active participation in building a more sustainable future.

Project "Young Entrepreneurship" (High School)

In this project, high school students are challenged to develop entrepreneurial skills by creating and managing a fictitious business. Students can identify problems or needs in their community and create innovative solutions. They draw up a business plan, define marketing strategies, manage finances, and present their products or services at a school fair. This project encourages teamwork, promotes creativity and strategic thinking, and provides students with hands-on experience of the business world.

Project "Exploring Local History" (Adult Education)

In this project, adult education participants have the opportunity to investigate the local history of their region. They can interview older residents, search historical archives, and visit relevant sites. Participants can document their findings through photographs, videos, or written accounts. This project allows adults to reconnect with their community, value their historical identity, and develop research and communication skills. In addition, it promotes a sense of belonging and strengthens social bonds between participants.

These are just a few examples of educational projects based on pedagogy and andragogy. Project-based education offers several possibilities of application, stimulating the protagonism of students and the construction of knowledge in a practical and contextualized way.

Challenges and strategies: identification of the challenges that may arise in the implementation of project-based education and suggestion of strategies to overcome them, considering pedagogical and andragogic aspects

The implementation of project-based education can present challenges in both the pedagogical and andragogic contexts. In this topic, we will identify some of these challenges and present strategies to overcome them, taking into account the characteristics and needs of both children and adults involved in the learning process.

Challenge: Time and resource management

Implementing educational projects requires adequate time and resources for planning, execution, and evaluation. In addition, it is necessary to balance the activities of the project with the curriculum and the demands of the study program.

Strategy: It is important to carry out detailed planning, establishing deadlines and resources necessary for each stage of the project. The organization and establishment of priorities help in time management. In addition, collaboration between educators, students, and others involved in the project can contribute to the equitable distribution of available tasks and resources.

Challenge: Student engagement and motivation

Maintaining student engagement and motivation throughout a project can be challenging, especially when it extends over an extended period. In addition, it is necessary to consider the different needs and learning styles of students.

Strategy: Create projects that are relevant and meaningful to students, allowing them to connect with their interests and needs. Setting clear goals and sharing project objectives with students helps keep them motivated. In addition, offering individualized support, providing constructive feedback, and promoting student autonomy can increase engagement and motivation throughout the process.

Challenge: Assessment of learning

Properly assessing student learning in projects can be challenging, as the skills developed can be multidimensional and difficult to measure through traditional tests alone.

Strategy: Use a variety of assessment strategies that cover different aspects of learning, such as presentations, reports, portfolios, and direct observation. Including clear assessment criteria and involving students in the process of self-assessment and co-assessment promotes a more comprehensive approach to assessment. It is also important to value the learning process, not just the end result, recognizing the progress and efforts of students throughout the project.

Challenge: Resistance to change

The implementation of project-based education may face resistance from educators, students, and even the school community, who may be accustomed to traditional teaching methods.

Strategy: Invest in training and training programs for educators, offering support and guidance for the implementation of educational projects. Sharing examples of success and evidence of the benefits of project-based education can help dispel resistance. In addition, involving parents and the community in the project proposal, showing how it can be relevant and beneficial to the development of students, can contribute to the acceptance and support of the approach.

Results and impact: discussion of the observed outcomes in terms of learning, developed skills and student engagement, as well as the impact of this approach on the integral formation of individuals

Project-based education has shown significant results in terms of learning, developed skills and student engagement. In this topic, we will discuss the results observed and the impact of this approach on the integral formation of individuals, considering different studies and researches carried out.

Meaningful and contextualized learning

Project-based education provides meaningful learning by engaging students in real, relevant situations. According to Jonassen (1999), meaningful learning occurs when students can relate new knowledge to previous experiences, building a deeper understanding. Through projects, students have the opportunity to apply knowledge in authentic contexts, which facilitates the transfer of learning to real-world situations.

Development of cognitive and social-emotional skills

Project-based education promotes the development of cognitive skills such as problem solving, critical thinking, decision-making, and collaboration. According to Bell (2010), the projects offer intellectual challenges that stimulate complex reasoning and the search for innovative solutions. In addition, projects also have a positive impact on students' social-emotional development, promoting skills such as teamwork, effective communication, leadership, and empathy (Krajcik et al., 2008).

Student engagement and motivation

Project-based education has been linked to greater student engagement and motivation in relation to learning. According to Blumenfeld et al. (1991), projects offer a clear and challenging purpose, which keeps students engaged and motivated throughout the process. In addition, the possibility of choosing topics of personal interest and making autonomous decisions during the project increases students' sense of control and empowerment.

Impact on the integral formation of individuals

Project-based education has a significant impact on the integral formation of individuals, contributing to the development of cognitive, socio-emotional and practical skills. This approach promotes more holistic learning, which goes beyond the transmission of content, actively engaging students and providing authentic learning experiences.

According to Perkins (1999), project-based education helps students build a deeper understanding of concepts, develop skills essential for the twenty-first century, and become lifelong learners. In addition, this approach also contributes to the development of competencies for citizenship, encouraging students to engage in social issues and to apply their knowledge for the common good.

Results and Discursions

Project-based education has been widely researched and discussed in the educational literature, and studies have pointed to several positive results of this approach.

With regard to learning, educational projects based on pedagogy and andragogy have been shown to promote meaningful and contextualized learning. According to Jonassen (1999), meaningful learning occurs when students are able to relate new knowledge to previous experiences, building a deeper understanding. Through the projects, students have the opportunity to apply the knowledge in real and relevant situations, which facilitates the transfer of learning to real-world situations.

In addition, project-based education contributes to the development of students' cognitive and socio-emotional skills. Bell (2010) points out that projects offer intellectual challenges that stimulate critical thinking, problem solving and decision-making. Students also have the opportunity to develop social-emotional skills such as teamwork, effective communication, leadership, and empathy, as pointed out by Krajcik et al. (2008).

Another result observed is the increase in student engagement and motivation in relation to learning. Blumenfeld et al. (1991) state that projects offer a clear and challenging purpose, which keeps students engaged and motivated throughout the process. The ability to choose topics of personal interest and to make autonomous decisions during the project increases students' sense of control and empowerment.

In the context of the integral formation of individuals, project-based education has a significant impact. Perkins (1999) points out that this approach helps students build a deeper understanding of concepts, developing essential skills for the twenty-first century and becoming lifelong learners. In addition, project-based education contributes to the development of citizenship skills by encouraging students to engage in social issues and apply their knowledge for the common good.

These results are consistent with the discussions found in the researched literature, which emphasizes the importance of active, meaningful and contextualized learning for the integral development of students. Project-based education, by actively engaging students in meaningful projects, promotes the practical application of knowledge, the development of cognitive, social-emotional and practical skills, and increases student motivation and engagement.

Conclusion

Project-based education has proven to be an effective approach to promote active and meaningful learning, both in pedagogy, aimed at the education of children, and in andragogy, directed to adult education. By engaging students in meaningful projects, this approach provides a number of benefits, such as developing cognitive, social-emotional, and practical skills, as well as increasing student motivation and engagement.

Throughout this work, we explore the principles of active and meaningful learning, emphasizing the importance of contextualization, relevance and practical application of knowledge. We also discuss the structure and stages of project-based education, highlighting goal setting, task organization, role division, and project evaluation as essential elements for its success.

In addition, we reflect on the role of the educator as a facilitator and advisor in the context of project-based education, recognizing their function of promoting autonomy, teamwork and critical thinking of students. The educator takes a key role in providing a stimulating learning environment by offering appropriate support, guidance and feedback so that students can actively engage in the learning process.

We present practical examples of educational projects based on pedagogy and andragogy, addressing different age groups and areas of knowledge. These examples illustrated how project-based education can be tailored to meet students' specific needs and interests, making learning more relevant and meaningful.

We also discuss the challenges that may arise in the implementation of project-based education and suggest strategies to overcome them. We recognize that adopting this approach requires careful planning, adequate resources, and a school culture that values

active and meaningful learning. However, the benefits observed and the positive impact on the integral formation of individuals justify the necessary effort and investment.

Finally, it is important to highlight the relevance of project-based education in the current educational context. We live in an ever-changing world in which students need to develop skills that go beyond the simple acquisition of knowledge. Project-based education offers an approach that stimulates creativity, critical thinking, collaboration, and problem-solving, preparing students to meet the challenges of the twenty-first century.

Therefore, project-based education represents an innovative and effective approach to promoting active and meaningful learning, both in pedagogy and andragogy. By taking this approach, educators have the opportunity to transform the educational experience, making it more engaging, relevant, and impactful for students. The challenge now is to continue exploring and enhancing this approach, sharing experiences and successful practices in order to provide a quality education that prepares students to become active, critical and competent citizens in an ever-evolving world.

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