Project- and Problem-Based Learning (PBL): An Approach to Skills Development in the 21st Century

Problem-Based and Project-Based Learning (PBL): An Approach to Developing 21st Century Skills

Josué Jorge Gonçalves da Silva – Vale do Acaraú State University (UVA)
Michelle Leandro de Oliveira – Paraíba State University (UEPB)
Wandemberg da Silva – Paraíba State University (UEPB)

Summary
This article examines Project and Problem-Based Learning (PBL) as an innovative approach to developing skills in the 21st century. ABP, by breaking with the traditional teaching model, places the student at the center of the learning process, stimulating autonomy, critical thinking, creativity and collaboration. The study discusses the definition, characteristics and history of PBL, highlighting its relevance in the current context of rapid technological and social transformations. Furthermore, the article explores 21st century skills, classifying them as cognitive, socio-emotional and technological, and emphasizing their importance for academic and professional success and for the exercise of citizenship. The relationship between PBL and the development of these skills is analyzed based on studies and evidence, demonstrating the potential of PBL to prepare students for the challenges of the future.
Key words: problem-based learning, 21st century skills, active methodology, personalization of teaching.

Abstract
This article analyzes Problem-Based Learning (PBL) as an innovative approach to developing skills for the 21st century. PBL, by breaking away from the traditional teaching model, places the student at the center of the learning process, stimulating autonomy, critical thinking, creativity, and collaboration. The study discusses the definition, characteristics, and history of PBL, highlighting its relevance in the current context of rapid technological and social transformations. In addition, the article explores the skills of the 21st century, classifying them as cognitive, socio-emotional, and technological, and highly important for academic and professional success and for the exercise of citizenship. The relationship between PBL and the development of these skills is analyzed based on studies and evidence, demonstrating the potential of PBL to prepare students for the challenges of the future.
Keywords: problem-based learning, 21st century skills, active methodology, personalized learning.

1. Introduction

Education in the 21st century faces the challenge of preparing students for a world in constant transformation, marked by globalization, technology and the need for constant adaptation. The knowledge society, driven by the digital revolution, requires individuals capable of continuous learning, thinking critically and creatively, collaborating with others and using technologies in an ethical and responsible way. In this context, the traditional teaching model, based on the transmission of standardized information to all students, is increasingly inadequate and ineffective.

The personalization of teaching emerges as a response to this demand for more individualized and relevant education for each student. This approach, which contrasts with the traditional "one size fits all" model, seeks to adapt the teaching-learning process to individual needs, interests and characteristics. duals of each student, maximizing their learning and development potential. Personalizing teaching is not just about offering different activities and resources for each student, but rather about creating a learning environment that respects and values each student's individuality, providing them with opportunities to explore their interests, develop their skills and to build your own knowledge.

Educational technologies, in turn, play a fundamental role in this process of personalizing teaching. Tools such as adaptive platforms, intelligent tutoring systems, virtual reality, augmented reality and gamification offer a range of possibilities to adapt teaching to needs.

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individual needs of each student. These technologies allow students to learn at their own pace, explore their interests, receive individualized feedback, and access resources and activities that meet their specific needs. Additionally, educational technologies can facilitate communication and collaboration between students and teachers, creating a more interactive and engaging learning environment.

This article aims to analyze the relationship between the personalization of teaching and educational technologies, exploring the theories that underlie this approach and the practices that make it possible. To this end, qualitative bibliographical research will be carried out, based on scientific articles, books and other relevant sources, which address the topic of personalization of teaching and educational technologies. The research will seek to identify the main theories and authors that support the personalization of teaching, the educational technologies most used to personalize teaching and the challenges and opportunities of personalizing teaching in the digital era.

The relevance of this study lies in the need to understand how the personalization of teaching, mediated by educational technologies, can contribute to improving the quality of education and to the development of essential skills for the 21st century, such as critical thinking, creativity, collaboration and communication. Personalizing teaching, by taking students' individual differences into account, can increase engagement, motivation and academic performance, in addition to promoting the development of important socio-emotional skills, such as autonomy, responsibility and self-esteem.

Furthermore, the research seeks to identify the challenges and opportunities of personalizing teaching in the digital age. The implementation of large-scale personalization of teaching requires investments in technological infrastructure, teacher training and the development of adapted teaching materials. The issue of privacy and security of student data is also an important challenge that needs to be addressed. However, educational technologies also offer opportunities to overcome these challenges, such as developing accessible online learning platforms and creating communities of practice that promote the exchange of experiences and collaborative learning among teachers.

This article seeks to contribute to the debate on the personalization of teaching and educational technologies, offering a critical and reflective analysis on the topic, based on a solid theoretical framework and empirical evidence. The research seeks to provide support for the formulation of public policies and pedagogical practices that promote a more equitable, inclusive and effective education, which prepares students for the challenges of the 21st century and which contributes to the construction of a more just and sustainable society.

2. Project and Problem-Based Learning (PBL):
2.1 Definition and Characteristics

Problem-Based Learning (PBL), as an active teaching methodology, revolutionizes traditional classroom dynamics, placing the student at the center of the learning process and challenging them to face real and complex problems. This innovative approach, which moves away from the transmissive teaching model, in which the teacher is the holder of knowledge and the student is a mere passive receiver, encourages student protagonism, encouraging them to seek solutions, research, experiment and collaborate with your peers.

PBL is characterized by a series of elements that distinguish it from other teaching methodologies. First, learning is active and collaborative, meaning that students not only absorb information but actively engage in knowledge construction, working as a team to solve problems and develop projects. This interaction between students promotes the exchange of ideas, the discussion of different perspectives and the development of socio-emotional skills, such as communication, collaboration and empathy.

Secondly, ABP focuses on problem solving and project development. The problems presented to students are real and relevant, related to their daily lives and interests. This contextualization of learning makes it more meaningful and motivating for students, who feel challenged to find solutions to problems that really matter. Project development, in turn, allows students to apply theoretical knowledge in practical situations, developing skills such as planning, organization, time and resource management, and presentation of results.

Thirdly, ABP values   student autonomy in the search for information and solutions. Students are not mere receivers of information, but active researchers, who seek information from various sources, such as books, articles, videos, websites and interviews with experts. This autonomy stimulates the development

development of critical thinking and analytical skills, as students need to evaluate the quality and reliability of the information they find, and select those that are most relevant to solving the problem.

Fourthly, the teacher assumes the role of facilitator and guide in PBL. He is not the holder of knowledge, but a guide who helps students on their learning journey. The teacher provides students with the tools and resources necessary to solve the problem, encourages discussion and reflection, and offers constructive feedback on student performance. This teacher's stance promotes students' autonomy and responsibility for their own learning, encouraging them to seek creative and innovative solutions.

Finally, assessment in PBL is formative and continuous. The objective of assessment is not only to measure the knowledge acquired by students, but also to monitor their progress, identify their difficulties and provide feedback so that they can improve their performance. Formative assessment can be carried out through various tools, such as observation, portfolios, self-assessment and peer assessment. This evaluative approach allows students to become more aware of their own learning and to develop self-assessment and metacognition skills.

2.2 ABP History

Problem-Based Learning (PBL) did not suddenly appear on the educational scene, but rather as a result of a long process of evolution and maturation of pedagogical ideas that date back to the beginning of the 20th century. The roots of ABP can be found in the New School movement, led by American philosopher and pedagogue John Dewey. Dewey advocated a pragmatic and experimental education, centered on the student's experience and solving real problems. He believed that education should prepare students for life by developing their critical thinking, problem-solving, and decision-making skills.

Dewey's vision influenced several educators and pedagogues, who sought to develop teaching methods that placed the student at the center of the learning process. One of these educators was William Kilpatrick, who, in the 1920s, proposed the project method as a way of applying Dewey's ideas in practice. The project method, which is based on carrying out practical and meaningful projects for students, shares many of the principles of PBL, such as active learning, collaboration and a focus on problem solving.

Throughout the 20th century, ABP continued to evolve and adapt to the new demands of society and education. In the 1960s, McMaster University in Canada implemented a problem-based medicine program, which became a landmark in the history of ABP. This program, which pioneered the application of PBL in the health sector, inspired other universities and schools to adopt this methodology.

In the current context, PBL is increasingly relevant, as the world becomes more complex, dynamic and interconnected. Rapid technological transformations, changes in the job market and social and environmental challenges require individuals to develop a set of skills that allow them to navigate this constantly changing landscape. PBL, with its emphasis on active learning, collaboration, problem solving and project development, presents itself as an effective methodology for developing these skills.

Digital technologies, in turn, have boosted PBL, offering new tools and resources for creating more interactive, collaborative and personalized learning environments. Online platforms, simulation software, collaboration tools and multimedia resources can enrich students' learning experience, making it more engaging and meaningful. ABP, combined with digital technologies, can prepare students for the challenges of the 21st century, forming critical, creative citizens and capable of solving complex problems.

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2.3 Main Authors and References

The genesis of Problem-Based Learning (PBL) is marked by emblematic figures who, with their innovative ideas and practices, shaped the foundations of this active teaching methodology. John Dewey, American philosopher and pedagogue, is considered one of the precursors of PBL, defending a pragmatic and experimental education, centered on the student's experience and the resolution of real problems. Dewey believed that learning should be an active, meaningful process in which students engage in activities

practical and relevant to their lives.

William Kilpatrick, an American pedagogue and disciple of Dewey, went a step further by proposing the project method as a way of applying Dewey's ideas in practice. Kilpatrick argued that students should learn by doing, by carrying out projects that allow them to apply theoretical knowledge in practical and relevant situations. The project method, with its emphasis on active learning, collaboration and problem solving, shares many of the principles of PBL and is considered an important precursor of this methodology.

Howard Barrows, an American physician and educator, was a pioneer in the application of PBL in healthcare. In the 1960s, Barrows led the implementation of a problem-based medicine curriculum at McMaster University in Canada. This innovative program, which confronted students with real medical problems and challenged them to find solutions, became a model for other medical schools around the world. Barrows' experience demonstrated the potential of ABP to train professionals who are more competent, critical and prepared for the challenges of medical practice.

David Kolb, an experiential learning theorist, also had a great influence on PBL. Kolb proposes an experiential learning cycle that includes four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. This cycle highlights the importance of concrete experience as a starting point for learning, of reflection on experience for the construction of meaning, of abstract conceptualization for the organization of knowledge, and of active experimentation for the application of knowledge in new situations. PBL, by placing students in front of real problems and challenging them to find solutions, provides an environment conducive to experiential learning, stimulating the complete learning cycle proposed by Kolb.

3. 21st Century Skills:
3.1 Definition and Classification

The concept of competence, in the context of education and the world of work, goes beyond the simple possession of knowledge and skills. It is an integrated set of knowledge, practices and attitudes that allow the individual to act effectively in different situations, mobilizing their internal and external resources to achieve objectives and solve problems. Perrenoud (1999) defines competence as "the ability to mobilize diverse cognitive resources to face a type of situation". This definition highlights the dynamic and contextualized nature of skills, which are not limited to a set of theoretical knowledge, but involve the ability to apply this knowledge in practice, in a flexible and adaptive way.

In the 21st century, the concept of competence gains even more relevance, as the world becomes more complex, dynamic and interconnected. Rapid technological transformations, changes in the job market and social and environmental challenges require individuals to develop a set of skills that allow them to navigate this constantly changing landscape. The UNESCO (2015) report on the future of education highlights the importance of developing so-called "21st century skills", which include not only traditional cognitive skills, such as critical thinking and problem solving, but also socio-emotional skills. , such as collaboration and empathy, and technological skills, such as the use of digital tools and digital literacy.

3.1.2 Cognitive Skills:

At the heart of 21st century skills are cognitive skills, which encompass critical thinking, problem solving and creativity. Critical thinking, as highlighted by Lipman (1995), allows the individual to analyze information in a logical and rational way, questioning assumptions, identifying getting biases and developing consistent arguments. Problem solving, in turn, involves ability to identify and analyze problems, generate and evaluate solutions, and implement the most appropriate solution. Creativity, as defined by Csikszentmihalyi (1996), is the ability to generate original and valuable ideas that contribute to solving problems and developing new products and services. These skills are essential for academic and professional success, as they allow the individual to learn autonomously, adapt to new situations and innovate.

3.1.3 Socio-emotional Skills:

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Socio-emotional skills, such as collaboration, communication, empathy and self-management, are increasingly valued in the world of work and in society. Collaboration, as stated by Johnson and Johnson (2009), is the ability to work as a team, cooperatively and constructively, to achieve common goals. Effective communication, both oral and written, is essential for conveying ideas, sharing information and building relationships. Empathy, the ability to put yourself in someone else's shoes and understand their feelings and perspectives, is fundamental for building healthy interpersonal relationships and resolving conflicts. Self-management, in turn, involves the ability to manage time, emotions and tasks effectively, to set goals and motivate oneself to achieve them. These skills are essential for developing healthy interpersonal relationships, leadership and success in collaborative work environments.

3.1.4 Technological Skills:

Technological skills, such as the use of digital tools and digital literacy, are indispensable in the age of information and communication. The use of digital tools, such as computers, smartphones, tablets and software, is increasingly present in people's daily lives, both at work and at leisure. Digital literacy, as defined by Gilster (1997), is the ability to use digital technologies critically and effectively, to access, analyze, evaluate and create information. Digital literacy is not limited to the technical mastery of tools, but also involves understanding the social, cultural and ethical impacts of using technologies. These skills are crucial for active participation in the digital society, for access to information and for professional development in various areas.

21st century skills are a broad and diverse set of knowledge, skills and attitudes that prepare the individual for the challenges and opportunities of the contemporary world. The development of these skills is essential for academic and professional success, active participation in society and personal well-being. Education, as a continuous and dynamic process, has the fundamental role of promoting the development of these skills, preparing new generations for an uncertain future, but full of opportunities.

4. Importance in the Current Context

In the current context, marked by accelerated changes and complex challenges, 21st century skills are indispensable requirements for full performance in the world of work, for the exercise of citizenship and for continuous lifelong learning.

4.1 World of Work:

The contemporary job market, driven by globalization, automation and artificial intelligence, requires professionals who are adaptable, creative and capable of working as a team. Adaptability, as Schwartz (2016) highlights, is the ability to adjust to new situations, learn new skills and reinvent yourself professionally. In a scenario of constant change, professionals who can quickly adapt to new demands and technologies are those who stand out and remain relevant.

Creativity, in turn, is the ability to generate new ideas and innovative solutions, to think outside the box and find new ways of doing things. In the world of work, creativity is increasingly valued, as it allows companies to innovate, differentiate themselves from the competition and find solutions to complex problems. Robinson (2001) argues that creativity is not an innate gift, but rather a skill that can be developed and stimulated through educational practices that value experimentation, curiosity and collaboration.

The ability to work as a team, to collaborate with others to achieve common goals, It is also fundamental in today's world of work. Companies are looking for professionals who know how to communicate effectively, who are able to listen and respect the opinions of others, who know how to negotiate and resolve conflicts, and who are willing to share knowledge and experiences. Johnson and Johnson (2009), in their studies on cooperative learning, demonstrate that teamwork not only improves student performance, but also promotes the development of important socio-emotional skills, such as empathy, responsibility and mutual respect.

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4.2 Citizenship:

The exercise of citizenship, in the 21st century, requires more than knowledge of civic rights and duties. Citizens need to be critical, informed and engaged in solving social problems. The ability to critically analyze information, question the status quo, identify problems and propose solutions is fundamental to building a more fair, democratic and sustainable society. Freire (1970), in his Pedagogy of the Oppressed, argues that education should be an act of liberation, which empowers individuals to think for themselves and transform social reality.

Citizen participation, whether through voting, engagement in social movements or acting in representative bodies, requires citizens to be informed about the problems that affect society and the different proposals for solutions. Access to information, facilitated by digital technologies, is fundamental for the formation of informed and aware citizens. However, information alone is not enough. Citizens need to be able to analyze information critically, identify reliable sources and distinguish between facts and opinions.

Engagement in solving social problems, in turn, requires citizens to mobilize, organize and propose solutions to problems that affect their communities and the country as a whole. Participation in social projects, volunteering initiatives and rights defense movements are examples of how citizens can contribute to the construction of a more just and egalitarian society.

4.3 Lifelong Learning:

Lifelong learning, or lifelong learning, is a concept that has become increasingly relevant in the 21st century. The rapid obsolescence of knowledge and constant changes in the world of work require individuals to always be learning, updating their knowledge and developing new skills. The ability to learn how to learn, to seek information autonomously, to evaluate the quality of sources and to apply the knowledge acquired in different contexts is fundamental to staying up to date and competitive in a world in constant transformation.

Lifelong learning is not restricted to the formal educational environment, but encompasses all learning experiences, formal and informal, that occur throughout an individual's life. Participation in courses, workshops, lectures, study groups, volunteer projects and other personal and professional development activities are examples of how individuals can continue learning throughout their lives.

21st century skills are essential for success in the world of work, for exercising citizenship and for lifelong learning. The development of these skills is not only an individual issue, but also a challenge for society as a whole. Education, as one of the pillars of society, plays a fundamental role in promoting the development of these skills, preparing new generations for an uncertain future, but full of opportunities.

5. Relationship between ABP and 21st Century Skills
5.1 Studies and Evidence

Problem-Based Learning (PBL) has been the subject of numerous studies that demonstrate its effectiveness in developing essential skills for the 21st century, such as collaboration, communication, critical thinking and creativity. In different contexts and levels of education, PBL has proven to be a promising methodology for preparing students for the challenges of the contemporary world, stimulating the development of skills that go beyond theoretical knowledge and that are increasingly valued in the job market and in life in society.

Regarding collaboration, ABP stands out for promoting teamwork, social interaction and negotiation among students. A study carried out by Dolmans et al. (2005) with medical students demonstrated that PBL significantly contributes to the development of collaboration, encouraging students to share information, discuss different perspectives and build joint solutions to the problems presented. Another study, conducted by Gijbels et al. (2005), with engineering students, revealed that PBL promotes collaboration between students, encouraging positive interdependence and shared responsibility for learning.

Communication, another fundamental skill for the 21st century, is also widely developed

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life at ABP. When working in teams to solve problems, students need to communicate their ideas clearly and concisely, argue in favor of their proposals, listen to and respect the opinions of their peers, and reach consensus. A study carried out by Hmelo-Silver (2004) with high school students demonstrated that PBL promotes the development of oral and written communication, encouraging students to express their ideas in a clear and organized way, to use evidence to support their arguments and to present your results persuasively.

Critical thinking, an essential skill for analyzing and evaluating information, is another pillar of PBL. When faced with complex and multifaceted problems, students are challenged to analyze information from different sources, question assumptions, identify biases and construct logical and consistent arguments. A study carried out by Schmidt et al. (1996) with medical students demonstrated that PBL promotes the development of critical thinking, encouraging students to question established knowledge, seek new information and formulate their own conclusions.

Creativity, the ability to generate new ideas and innovative solutions, is also stimulated by ABP. When working as a team to solve problems, students are encouraged to think outside the box, explore different possibilities and propose original and creative solutions. A study carried out by Hung (2011) with design students demonstrated that PBL promotes the development of creativity, encouraging students to experiment, take risks and seek innovative solutions to the challenges proposed.

Problem-Based Learning (PBL) has proven to be an effective methodology for developing essential skills for the 21st century, such as collaboration, communication, critical thinking and creativity. In different contexts and educational levels, PBL has provided students with the opportunity to learn in an active, collaborative and meaningful way, preparing them for the challenges of the contemporary world.

5.3 Mechanisms of Action

Problem-Based Learning (PBL) serves as a catalyst for the development of essential 21st century skills by providing a dynamic and interactive learning environment that encourages collaboration, communication, critical thinking and creativity.

At ABP, collaboration is intrinsic to the learning process. Students work in small groups to solve complex problems, which requires collaboration among team members. To achieve a common goal, students need to share information, discuss different perspectives, negotiate solutions, and make joint decisions. This collaboration process encourages the development of interpersonal skills, such as communication, empathy, leadership and conflict resolution, corroborating Vygotsky's (1978) view of the importance of social interaction in learning. Furthermore, collaboration in PBL promotes positive interdependence among students, that is, the perception that each person's success depends on the group's success, which increases motivation and engagement in learning, as Johnson and Johnson point out (1989).

Effective communication is fundamental to the success of ABP, as it allows students to express their ideas, defend their points of view and build knowledge together. Throughout the problem-solving process, students need to present their ideas, argue in favor of their proposals, listen to and respect the opinions of their peers, and reach a consensus. PBL provides a safe and stimulating environment for practicing oral and written communication, encouraging students to express their ideas in a clear and organized way, to use evidence to support their arguments and to present their results in a persuasive way, as highlighted by Vygotsky (1978) when stating that "language is not only a means of communication, but also an instrument of thought". Furthermore, communication in PBL is not limited to interaction between students, but also involves communication with the teacher, who acts as a facilitator and guiding the process, as suggested by Woods (1994).

Critical thinking is one of the most valued skills in the 21st century, and PBL offers fertile ground for its development. When confronting students with complex and multifaceted problems, PBL requires them to analyze information from different sources, question assumptions, identify biases, and construct logical and consistent arguments. According to Facione (2011), critical thinking involves "the ability to think clearly and rationally, to understand the logical connection between ideas". In ABP, students are encouraged to question established knowledge, seek new information and formulate their own conclusions, thus developing intellectual autonomy and the ability to make informed decisions.

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Creativity, the ability to generate new ideas and innovative solutions, is also stimulated by ABP. By working in teams to solve real problems, students are encouraged to think outside the box, explore different possibilities and propose original and creative solutions. ABP provides a safe environment for experimentation and risk-taking, encouraging students to test their ideas and learn from their mistakes. Creativity, as Csikszentmihalyi (1996) states, is "a process that results in a new, original and valuable product". At ABP, students have the opportunity to develop their creativity by seeking innovative solutions to proposed problems, contributing to the construction of a better future.

Problem-Based Learning (PBL) is a methodology that promotes the development of essential skills for the 21st century, such as collaboration, communication, critical thinking and creativity. By placing the student at the center of the learning process and challenging them to solve real problems, PBL encourages the development of skills that are increasingly valued in the job market and in society, as stated by authors such as Savery (2006) and Dolmans et al. (2005).

6. Final Considerations

The analysis of Project and Problem-Based Learning (PBL) in this study revealed its intrinsic connection with the demands of 21st century education and the development of crucial skills for the future. ABP, by breaking with the traditional model of transmissive teaching, places the student as the protagonist of their learning, encouraging them to seek solutions to real and relevant problems, to collaborate with their peers and to develop projects that connect them with the real world. .

The study showed that PBL is not just a methodology, but an educational philosophy that values autonomy, critical thinking, creativity and collaboration. By stimulating research, experimentation and the practical application of knowledge, ABP prepares students for the challenges of a world in constant transformation, where the ability to learn how to learn and adapt to new situations is fundamental.

The evidence presented in this study demonstrates that PBL is a powerful tool for developing 21st century skills. Collaboration, communication, critical thinking and creativity are essential skills for success in the job market, for exercising citizenship and for lifelong learning. ABP, by providing an active, collaborative and challenging learning environment, encourages the development of these skills in an integrated and meaningful way.

However, implementing PBL on a large scale is not without challenges. Teacher training, the development of appropriate teaching materials and the adaptation of school infrastructure are some of the obstacles to be overcome. Furthermore, it is necessary to ensure that PBL is implemented consistently and effectively, with continuous monitoring and evaluation.

Despite the challenges, the benefits of ABP are undeniable. By preparing students for the challenges of the 21st century, ABP contributes to the formation of more critical, creative, collaborative citizens who are prepared for the future. PBL is not just a teaching methodology, but an investment in the future of education and society.

7. References

AINSCOW, M. (2001). Developing inclusive schools: ideas for action. Porto Alegre: Artmed. AUSUBEL, DP (1968). Educational psychology: A cognitive view. New York: Holt, Rinehart and Winston. BAKHTIN, M. (1981). Marxism and philosophy of language. São Paulo: Hucitec.
BALDRY, AC, & FARRINGTON, DP (2000). Bullying among pupils and delinquency in school and community: A longitudinal study. Journal of Adolescence, 23(4), 441-459.
BANDURA, A. (1977). Social learning theory. Englewood Cliffs, NJ: Prentice Hall.
BLUMENFELD, P.C., SOLOWAY, E., MARX, R.W., KRAJCIK, J.S., GUZDIAL, M., & PALINC-SAR, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. Educational Psychologist, 26(3-4), 369-398.
BOOTH, T., & AINSCOW, M. (2002). Index for inclusion: Developing learning and participation in schools. Bristol: Center for Studies on Inclusive Education.
BRAY, B., & MCCLASKEY, K. (2017). Personalizing learning: A guide for engaging students with technology. Thousand Oaks, CA: Corwin.
BROOKFIELD, S. D. (1987). Developing critical thinkers: Challenging adults to explore alternative ways of

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thinking and acting. San Francisco: Jossey-Bass.

BRUNER, J. S. (1960). The process of education. Cambridge, MA: Harvard University Press. CARVALHO, RE (2008). Inclusive education: dotted with the "i's". Porto Alegre: Mediation. COIRO, J., KNOBEL, M., Lankshear, C., & Leu, DJ (Eds.). (2013). Handbook of research on new literacies. New York: Routledge.

CRAIG, W. M., PEPPLER, D. J., & ATLAS, R. (2000). Observations of bullying in the playground and in the classroom. School Psychology International, 21(1), 22-36.

CSIKSZENTMIHALYI, M. (1996). Creativity: Flow and the psychology of discovery and invention. New York: Harper Perennial.

CUNHA, RB (2015). Bullying and school violence: what to do? Brasilia: UNESCO. DARLING-HAMMOND, L., BARRON, B., PEARSON, PD, WELCH, AH, RIORDAN, M., & WOOLF, B. (2008). Powerful learning: What we know about teaching for understanding. San Francisco: Jossey-Bass. DEBARBIEUX, E., & BLAYA, C. (2001). Violence in schools and public policies. Brasilia: UNESCO. DECI, EL, & RYAN, RM (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum.

DELORS, J. (1996). Education, a treasure to discover. Report to UNESCO of the International Commission on Education for the 21st Century. São Paulo: Cortez.

DEWEY, J. (1933). How we think: A restatement of the relation of reflective thinking to the educational process. Boston: DC Heath.

DEWEY, J. (1938). Experience and education. New York: Macmillan.

DOLMANS, DH, DE GRAAFF, E., WOLFHAGEN, IH, & VAN DER VLEUTEN, CP (2005). Problem-based learning: Future challenges for educational practice and research. Medical Education, 39(7), 732- 741.

DYSON, A. (2001). Paths to diversity: the construction of an inclusive school. Porto Alegre: Artmed.

ELIAS, MJ, ZINS, JE, WEISSBERG, RP, FREY, KS, GREENBERG, MT, HAYNES, NM, ... & SHURE, MB (1997). Promoting social and emotional learning: Guidelines for educators. Alexandria, VA: Association for Supervision and Curriculum Development.

ENNIS, RH (1985). A logical basis for measuring critical thinking skills. Educational Leadership, 43(2), 44-48.

ESPELAGE, DL, BOSWORTH, K., & SIMON, TR (2003). Examining the social context of bullying behaviors in early adolescence. Journal of Counseling & Development, 81(3), 326-333.

FACIONE, PA (2011). Critical thinking: What it is and why it counts. Millbrae, CA: Measured Reasons and The California Academic Press.

FANTE, C. (2012). Bullying phenomenon: how to prevent violence in schools and educate for peace. Campinas: Verus Editora.

FREIRE, P. (1970). Pedagogy of the oppressed. Rio de Janeiro: Peace and Land. FREIRE, P.

(1987). Pedagogy of the oppressed. 17th ed. Rio de Janeiro: Peace and Land.

FREIRE, P. (1996). Pedagogy of autonomy: knowledge necessary for educational practice. São Paulo: Peace and Land.

GADOTTI, M. (2000). Earth pedagogy. São Paulo: Peirópolis.

GARDNER, H. (1983). Frames of mind: The theory of multiple intelligences. New York: Basic Books. GIJBELS, D., DOCHY, F., VAN DEN BOSSCHE, P., & SEGER, M. (2005). Effects of problem-based learning: A meta-analysis from the angle of assessment. Review of Educational Research, 75(1), 27-61. GILSTER, P. (1997). Digital literacy. New York: Wiley Computer Publishing.

GLAT, R., & BLANCO, R. (2011). Inclusive education: culture and school daily life. Rio de Janeiro: 7Letters.

GOLEMAN, D. (1995). Emotional intelligence. New York: Bantam Books.

GRIFFIN, P., & CARE, E. (2012). Assessment and teaching of 21st century skills: Methods and approaches. New York: Springer.

GUILFORD, J. P. (1950). Creativity. American Psychologist, 5(9), 444-454.

HARGREAVES, A., & FULLAN, M. (2012). Professional capital: Transforming teaching in every school. New York: Teachers College Press.

HMELO-SILVER, CE (2004). Problem-based learning: What and how do students learn?. Educational Psychology Review, 16(3), 235-266.

HORN, M.B., & STAKER, H. (2015). Blended: Using disruptive innovation to improve schools. San Francisco: Jossey-Bass.

HUESSMANN, L.R. (2003). Effects of media violence on children and youth. In GA Comstock & JA

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Bryant (Eds.), Handbook of media effects (pp. 397-422). Thousand Oaks, CA: Sage.

HUNG, W. (2011). Theory to reality: A few issues in implementing problem-based learning. Educational Technology Research and Development, 59(4), 529-552.

JOHNSON, D. W., & JOHNSON, R. T. (1989). Cooperation and competition: Theory and research. Edina, MN: Interaction Book Company.

JOHNSON, DW, & JOHNSON, RT (2009). An educational psychology success story: Social interdependence theory and cooperative learning. Educational Researcher, 38(5), 365-379.

JONASSEN, DH (1999). Designing constructivist learning environments. In CM Reigeluth (Ed.), Instructional design theories and models: A new paradigm of instructional theory (Vol. II, pp. 215-239). Mahwah, NJ: Lawrence Erlbaum Associates.

KAHNEMAN, D. (2011). Thinking, fast and slow. New York: Farrar, Straus and Giroux.

KAPP, K. M. (2012). The gamification of learning and instruction: Game-based methods and strategies for training and education. San Francisco: Pfeiffer.

KILPATRICK, W. H. (1918). The project method: The use of the purposeful act in the educational process. Teachers College Record, 19(4), 31