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Aplicação do Ensino Baseado em Problemas em Escolas de Administração

Applying Problem-Based Learning in Management Schools

La Aplicación del Aprendizaje Basado en Problemas en las Escuelas de Administracion

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RESUMO

O objetivo deste artigo foi discutir a importância de novas metodologias pedagógicas para desenvolver habilidades em gestão em escolas de administração, em complemento ao método tradicional. Neste estudo, contamos com uma metodologia bibliográfica resgatando o conceito, características e uso da metodologia de ensino Aprendizagem Baseada em Problemas (ABP) em cursos de Nível Superior, sobretudo em escolas de administração. Além disso, usamos o método de pesquisa de narrativa, que inclui a entrevista de um professor com experiência na implementação do ensino ABP em uma Instituição de Ensino Superio no Brasil. Em complemento, descrevemos um caso prático de ABP na Escola de Administração da Fundação Getúlio Vargas. Os resultados mostraram que diferentes métodos refletem processos de aprendizagem multimensionais, intencionais ou não. A educação se desenvolve em meio a uma sociedade imperfeita, onde muitos valores ensinados e apreendidos não se aproximam do mundo real. Reforçamos que o método de educação tradicional ainda ocupa um espaço relevante nas IES, devido à sua importância institucional, aos anos de certificação e investimentos realizados ao longo dos anos.

Palavras-chave: metodologia de ensino. aprendizagem baseada em problemas. método tradicional. habilidades gerenciais. administração. .

ABSTRACT

The aim of this article is to discuss the potential of new pedagogical methodologies for enhancing management skills in management schools, as a complement to the traditional method. In this study, we adopted a bibliographic method to explore the concept, characteristics, and use of Problem-Based Learning teaching methodologies (PBL) in higher education courses, particularly in management schools. Moreover, we used a narrative research method, which included interviewing a Brazilian Professor with experience in implementing PBL teaching in a higher education institution. Our study also describes a practical application of PBL at the Fundação Getúlio Vargas. The results showed that different methods reflect different multidimensional learning processes, whether intentional or not. In a constantly changing society, everything we share cognitively or emotionally becomes more complicated, as many of the values taught and learned do not correspond to the real world. We emphasize that the traditional education method still holds a significant place in higher education courses due to its institutional importance, numerous certifications, and the investments made over the years.
Keywords: *teaching methodology. problem-based learning. traditional method. managerial skills. business administration.*

RESUMEN

En este artículo, se decide tratar la importancia de las nuevas metodologías pedagógicas para desarrollar habilidades de gestión en escuelas de negocios además del método tradicional. En este estudio disponemos de una metodología bibliográfica que rescata el concepto, características y uso de la metodología educativa basada en los aprendizajes problemáticos. Por otro lado, utilizamos el método de investigación narrativo, que incluye una entrevista con un docente con experiencia en la implementación del PBL en una Institución de Educación Superior brasileña. También describimos un caso práctico para la Fundación Getúlio Vargas Escuela de Administracion. Los resultados mostraron que los diferentes métodos reflejan procesos de aprendizaje multidimensionales, intencionales o no. La educación se desarrolla en medio de una sociedad imperfecta donde muchos valores enseñados y aprendidos no se acercan al mundo real. Reforzamos que la modalidad de educación tradicional aún ocupa un espacio relevante en las IES, por su importancia institucional, años de certificación e inversiones realizadas a lo largo de los años.
Palabras clave*: metodología de la enseñanza. aprendizaje basado en problemas. método tradicional. habilidades directivas. administración.*

Introdução

The traditional teaching method is an educational practice passed down through generations and has served as a reference for many pedagogical approaches (SILVA, 1980 *apud* MIZUKAMI, 1986). In this model, the teacher is the primary knowledge holder, establishing a hierarchical teacher/student relationship, which

places the student as a listener, in a more passive position. The level of content understanding is assessed only after the class, through evaluations (GUEDES, 2014). However, since the 1990s, with the advent of the Internet, students have gained quick access to information from multiple sources, thereby changing the traditional role of professors as exclusive knowledge bearers. In this context, traditional teaching-learning approaches, even though already undergoing transformations, have become the central point of debate among researchers and educators, considering the new learning methodologies available (GUEDES, 2014).

Although traditional lectures have long been a mainstay in college courses (STAINS *et al.*, 2018), they have frequently drawn criticism for their passive nature and their tendency to result in less student learning compared to more active methods (DESLAURIERS *et al.*, 2019). Researchers McGee and Bruce Howard have observed that traditional approaches fail to create a competitive and socially interactive classroom environment (AKOI *et al.*, 2021). A single teaching method may not address the diverse needs of the students, who often have numerous questions regarding teaching concepts, and may find their attention divided (AKOI *et al.*, 2021). In sum, the passive role of students has been questioned, and there is a demand for greater autonomy and the development of interpersonal skills as preparation for cooperative work (DEAN; JOLLY, 2012).

According to Soares (2008), universities began adopting new teaching methodologies to enhance teaching and learning effectiveness and increase student engagement. Choosing a methodology and determining how to implement it requires research and experiment with several pedagogical alternatives (ANDRADE, 2002). An approach to enhance teaching and learning effectiveness involves promoting a more active role for students, one that is less passive compared to traditional lectures and that fosters student autonomy. According to Oliveira (2010, p. 14),

> Thus, complementary and alternative methods to lectures have emerged, such as seminars, discussions and debates, case studies, business games, exhibitions, site visits, dissertations, guest lecturers and interviews, activities, directed studies, simulations and role-playing, all designed to demonstrate real-word situations in the classroom.

In the current context, there is consensus regarding the importance of education, particularly in how students develop skills that are essential in future workplaces and in other professional environments (MANRESA MATAS; BERBEGAL-MIRABENT; GIL-DOMENECH, 2020).

In their study, Brown, Rich and Holtham (2014), indicate that students pursuing degrees in administration aim for managerial careers. Therefore, these students will be dealing with complex, fast-changing problems, that demand not only the core knowledge of management disciplines but also their practical application as well as a range of personal business skills. The development of skills – defined as the individual's ability to effectively perform specific tasks – has become increasingly relevant in business and management academic programs over the last decades (UNGARETTI *et al.*, 2015).

According to Ungaretti *et al.* (2015), several studies consistently advocated the importance of developing undergraduate students' skills to enhance their performance in the work force. Ungaretti *et al.* (2015) identify these skills as oral and written communication, critical and creative thinking, leadership, problem-solving, ethical problem-solving, and ongoing education. This set of skills outlined in the paragraph is supported by various studies, such as Wagner's (2010) Global Achievement Gap Study.

The problem-based learning (PBL) approach, which emphasizes the development of individuals skills (UNGARETTI *et al.*, 2015), is among these alternative teaching methodologies. PBL highlights skills such as analysis and resolution of complex real-life problems (DUCH; GROH; ALLEN, 2001; SOUZA; VERDINELLI, 2014); and demonstrates positive effects in developing social skills and cognitive dimensions (KOH *et al.*, 2008). Problem-based learning is a pedagogical approach that involves students in designing and solving problems, often of a management or professional nature. This approach has been widely adopted in many countries, including the United States, the Netherlands, Brazil, and others, due in part to its perceived benefits for students and the belief that it

increases student engagement (DISLA GARCÍA, 2013; TIPPELT; LINDEMANN, 2001).

For the development of professional skills, Problem-Based Learning (PBL) stands out as one of the most appropriate strategies (SAORÍN *et al.*, 2019). A researcher in entrepreneurship studies implemented PBL as part of the learning process and found it very effective (BELL, 2008). PBL has been applied widely in several fields, including business and economics (GRASAS & RAMALHINHO, 2016). The experience gained by students was more realistic and relevant. Another study noted PBL's positive impact on logistics and supply chain management studies (TORTORELLA; CAUCHICK-MIGUEL, 2018). PBL exposes students to real-world problems and has been successfully integrated an effective complement method to learn manufacturing practices. By integrating theory and practice, it enhances motivation among management students, which has positive implications (SILVA *et al.*, 2018).

We should note, even though it is not the focus of this paper, that case teaching methods have also been used in management education since 1920 at Harvard Business School (SHUGAN, 2006; TREJO-PECH; WHITE, 2017). Despite criticism from scholars, the case method remains an important pedagogy in education today (MESNY, 2013). According to Shugan (2006), the case method negatively impacts faculty research resources and hinders the dissemination of research results. Due to the challenge of establishing a clear correlation between the case method and a student's performance, later in life, as a manager (MESNY, 2013), the theoretical framework behind the case method is still under development (BURGOYNE; MUMFORD, 2001; GUESS, 2014).

For example, the goal of critical and creative thinking is to apply critical thinking elements, identify options and novel solutions, and compare various viewpoints. As students analyze complex and ambiguous problems and as they consider multiple viewpoints, case teaching fosters these goals (GUESS, 2014). In addition, this characteristic can sometimes intentionally create uncertainty, ambiguity, complexity, and diversity, which are common in challenging

management scenarios (BOOTH *et al.*, 2000). Lack of management experience and low tolerance for complexity and uncertainty pose particular challenges for undergraduates. It is well-known that what works for teaching graduate students may not necessarily work for teaching undergraduates when using the case method.

This discussion is not just about the teacher's role, but also about the educational model applied in the classroom. Companies hiring recent graduates (holders of undergraduate or graduate degrees in management) claim that academically trained workforce lacks practical competencies. Corporate leaders have criticized the traditional education system for preparing professionals who are unprepared for the dynamic and competitive job market (CUMMINS *et al.*, 2019; PFEFFER; FONG, 2002). Criticisms directed at the skills developed and the teaching methodologies adopted have led several authors to advocate for new professional profiles, emphasizing a series of competences such as communication, problem-solving, leadership, teamwork - seen as essential for achieving more effective results and addressing the challenges in this new organizational environment (CHONG, 2011; DÍAZ-FERNÁNDEZ; LÓPEZ-CABRALES; VALLE-CABRERA, 2014; ESPOSITO; FREDA; BOSCO, 2015; VELIU; MANXHARI, 2017).

According to Bonal and Rambla (2003), student interaction could help bridge these gaps by promoting knowledge acquisition and enhancing cooperation, thereby favoring skills such as negotiation.

In general, lectures primarily focus on unilaterally transmitting content, which often deprives students of opportunities to exercise more complex intellectual skills, such as application, analysis, synthesis, and judgment (GODOY, 2000). For decades, critics have pointed out the need for greater emphasis on developing managerial skills in administration programs. However, the improvements have not been widely perceived (DIERDORFF; RUBIN, 2009; DIERDORFF *et al.*, 2013; MINTZBERG, 2004).

On the other hand, Moran (2017, p. 3) highlights that learning processes are "multiple, continuous, hybrid, formal and informal, organized and open, intentional and unintentional". In other words, learning is distinct and unique to everyone, who

apprehends certain information and knowledge based on what they consider relevant at the time and their life experiences. Thus, traditional education maintains relevance due to its institutional relevance, certification history, and significant investments made. However, traditional methodologies can be combined and coexist with inductive teaching approaches, promoting students' experimentation and inquiry, enabling deeper and more holistic understanding.

Criticism towards traditional methodologies varies in intensity, prompting readers to filter and confront ideas independently. Active methodologies can serve as supplements or alternatives for student development. Moran (2017, p. 3), for instance, argues for the relevance of active methodologies, affirming that they promote an enhancement in "our cognitive flexibility, which is the ability to alternate and perform different tasks, mental or objective operations, and to adapt to unexpected situations, overcoming rigid mental models and inefficient automatisms". Therefore, theories and approaches can be combined and applied to real-life situations, where all relevant information for decision-making might not be available, requiring students to correlate concepts from different areas of knowledge, under pressure, and within an ever-changing environment.

Active learning occurs when professors empower students to lead the learning process. The learner develops complex skills, such as proactivity, crucial for professional life (CAMPOMAR; IKEDA; VELUDO DE OLIVEIRA, 2003; GWEE, 2009).

In active methodologies, emphasis is placed on engaging students during classes. Engagement is encouraged and can be fostered in many ways, including collaborative learning, problem-based learning (PBL), or cooperative learning. Problem-solving as a teaching strategy is common in active methodologies. It aims to motivate students through more dynamic processes that require problem analysis, reflection and connecting the problem to their own experiences. Student engagement happens as they learn through problem-solving. Students commit to the learning process by dealing with specific problems in their field of study (MITRE *et al.*, 2008; SOUZA; VERDINELLI, 2014).

The active methodology aims to promote student's critical thinking abilities, enabling them to analyze situations, raise hypotheses of causality and explore possible solutions. As situations are ideally inspired by real-word problems, the aim is for theory and practice to be integrated, enhancing the applicability of learning (DIAZ-BORDENAVE; PEREIRA, 2007; FREITAS, 2012; LUCKESI, 1991; SOUZA; VERDINELLI, 2014). Students actively engage and play an active role, developing characteristics such as teamwork (collaborating on solutions and conducting group presentations), a sense of responsibility (autonomously seeking solutions), self-assessment (exercising autonomy and interaction with ideas of other students), as well as being more reflective, critical, creative and curious (due the exposure to adverse situations posed by active methodologies and their need to find a solution) (ESCRIVÃO FILHO; RIBEIRO, 2008; MITRE *et al.*, 2008).

An important difference between active and traditional methodologies lies in the role of the teacher. In active methodologies, learning centers around the student, who takes a leading role, whereas professors act as mediators (GUEDES, 2014).

Implementing active methodologies poses many challenges, as it has a great impact on the teaching-learning process and on the roles and activities of educators. Tractenberg (2011) discusses university isolation and individualism, which can be understood as one of the challenges in adopting any methodology other than the traditional one. The absence of collective projects and a collaborative culture coupled with a knowledge transmission-based approach (deductive) rather than exchange among professors or between professors and students (deductive combined with inductive), may have intensified isolation, creating barriers to the proposition of active methodologies.

Jennings (2002) points out that implementing and monitoring active learning projects can intensify faculty's work. Educational institutions should consider this factor when planning the transition or integration between traditional and active methodologies. Regarding PBL specifically, Ungaretti *et al.* (2015, p. 178) argue that "there is no set of universally applicable guidelines" ensuring its successful implementation. This complexity underscores the importance of top management

support to foster successful adoption and application and of the methodology. The journey of adopting such methodologies requires preparing the faculty, selecting good high-quality problem questions, and adapting to ensure effectiveness. Therefore, all the initial risks and discomfort are mitigated as practice evolves.

Problem-based learning is inspired by "the principles of the active school and the scientific method, in which students learn how to learn and prepare to solve problems related to their future profession" (BERBEL, 1998, p. 152). The history of PBL aligns with established educational theories, notably those of two intellectuals: Dewey and Bruner. Both Dewey (1978) and Bruner (1976) advocate constructivist approach, where professors have the role of provoking students to seek knowledge and solutions, guiding them to the learning process (BOROCHOVICIUS, 2012). Thus, students engage in different mental processes (ability to raise hypotheses, compare, analyze, interpret, evaluate), taking responsibility for their own training (CYRINO; TORALLES-PEREIRA, 2004). The idea of promoting active knowledge interactions that lead students to meaningful learning through different mental processes transcends the philosophical-pedagogical field and is also the subject of scientific studies.

According to Schwartz and Webb (2001), although PBL emphasizes the use of problems, the main objective is to stimulate knowledge through the data these problems present. In addition to obtaining solutions to problems stimulated and discussed by students, a proactive attitude is also encouraged, a position that brings a gain in personal and professional development.

The advantages of using active methodologies such as PBL are widely recognized in the literature. In the study by Souza and Verdellini (2014), when students evaluated the PBL method, they pointed out that the integration of theory and practice facilitated the learning process. In this same perspective, in Silva *et al*. (2018) research, undergraduate students mentioned that the main implication of PBL in their learning refers to the integration of theory and practice. Based on real problems presented by small businessmen, in the case of this research, students were encouraged to present viable solutions based on concepts extracted from

books and academic articles. In addition, with PBL, students become the protagonists of their knowledge and develop skills such as autonomy in learning, ability to work in teams and competence to reflect and present solutions to concrete problems (MISCHIATTI *et al.*, 2019). Another feature and advantage of PBL is the opportunity for participants to share knowledge, learn and propose solutions through collaboration with their peers (MISCHIATTI *et al.*, 2019).

As for the limitations of the PBL method in promoting learning, the respondents mentioned the passivity of some students in the workgroups and the difficulty of reaching consensus in presenting a solution to the problem presented (SILVA *et al.*, 2018). The implementation of PBL, however, encounters more resistance in educational institutions where there is a predominance of traditional teaching methods and apprehensions resulting from the introduction of new teaching methodologies (GIL, 2015; MISCHIATTI *et al.*, 2019).

In this context, academia must analyze which aspects of teaching and learning should be prioritized to achieve the desired outcomes and develop the skills students need (BANDO; NÄSLUND-HADLEY; GERTLER, 2018). Additionally, Saorín *et al.* (2019) emphasize that universities must prepare students for the labor market by providing them with the right competencies, skills, and knowledge in today's fast-paced world. The search and adoption of learning methods that enhance and develop the cognitive and behavioral skills students need for an adequate professional performance reflect the objective of promoting "the development of students to become management practitioners" (JENNINGS, 2002, p. 656). As a result, it is necessary to continuously adapt to the market because these requirements are constantly changing.

Methodology

Our methodology consists of two stages. The first involves compiling a bibliography that gathers studies attesting the importance of implementing innovative pedagogical methods to develop management skills in undergraduate and graduate schools – alongside the traditional method. The bibliographic method is a requirement for all scientific work, and is done by collecting articles, books, and

scientific data for citation (ESTRELA, 2018). Moreover, we used the narrative research method. This includes reporting on the interviewee's individual experience with PBL and the changes implemented in their Higher Education Institution. The narrative research method (CLANDININ; CONNELLY, 2000) allows focusing on the life of a single person without sacrificing the scientific rigor necessary for knowledge production (CRESWELL, 2012). Based on the interview with the Professor involved in PBL implementation, we describe a potential problem-based classroom action in management schools. The situation we describe in this article (item 3.1.3) illustrates everyday situations encountered in classes. As a result, the teacher has more opportunity to work on critical concepts about research methodology, as well as foster more interactive, questioning, and reflective students.

FINDINGS

PBL as a Teaching-Learning Model: Origin and Dissemination in Brazil

In 1965, John Evans, the Dean of McMaster School of Medicine in Ontario, Canada, realized that students received a vast amount of content but were exposed to only a few applicable ideas. To address this, he decided to carry out experiments to make the teaching-learning process more practical. John Evans convened a small group of doctors to form the Education Committee of McMaster University, aiming to equip students with new skills that would provide them greater ability to work in teams and self-directed learning (BOROCHOVICIUS, 2012; SILVA *et al.*, 2018). The Committee (EMU) visited other universities in search of methodologies or inspirations that could be applied in their programs, drawing insights from USA institutions such as Harvard Business School and the Case Western Reserve University of Medicine, in Ohio. Other renowned institutions helped spread the methodology in different countries, including the Dutch Maastricht University, known globally for its pioneering work in the method, as well as Aalborg University, in Denmark, and the University of Newcastle, in Australia (RIBEIRO, 2008).

According to Evensen and Hmello (*apud* DECKER; BOUHUIJS, 2009), those disseminating the methodology used pedagogical formats and experiments that kept the students engaged and aware of the relevance of learning, especially regarding practice. As the PBL approach is a constructivist educational model, it can enhance creative thinking and maintain uncertainty in nonroutine problem-solving processes for students. Compared to traditional teaching, PBL more effectively increased self-efficacy and critical thinking in preservice elementary professors (KARDOYO *et al.*, 2020; SAPUTRO *et al.*, 2020).

According to Branda (2009) the first experiences with PBL in Brazil took place at the School of Public Health of Ceará in 1993; at the Faculty of Medicine in Marilia in 1907 (the implementation was gradual, course by course, until 2002 when the first class with all courses using PBL graduated), and at the Medical Sciences course of the State University of Londrina in 1998 (BISPO; LODI, 2022; COELHO-FILHO; SOARES; SÁ, 1998).

Although PBL stood out in the health field in Brazil (RIBEIRO; MIZUKAMI, 2005), it is also implemented in other university programs, for example in two undergraduate courses of the Fundação Getulio Vargas (FGV): São Paulo School of Economics (FGV EESP) and the Brazilian School of Public and Business Administration (FGV EBAPE).

At FGV, PBL was first implemented at the São Paulo School of Economics (FGV EESP) in 2013. In an interview conducted in 2019 during the preparation of this article, the school's dean, Professor Nakano, mentioned that the process of discussing whether to use PBL in the economics program lasted ten years. For the dean, it was necessary to adapt the pedagogy of the economics program to demand more from the students in terms of their ability to think and innovate. Professor Nakano had the first contact with PBL in the Netherlands, at the University of Maastricht. He also visited other institutions that applied PBL, but the inspiration to implement such pedagogical change at FGV EESP came from the University of Maastricht. Training sessions were conducted in São Paulo with a professor from the School of Management and Economics of the Dutch university. The learning

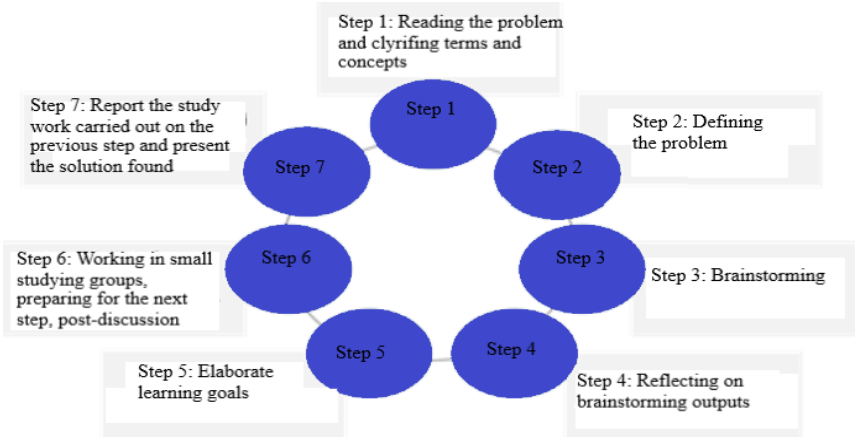
process was entirely adapted to local solutions, with intense student participation in all classes.

At EBAPE, the PBL method began in 2014 with faculty training at FGV in Rio de Janeiro and at the University of Maastricht. In 2015, the Introduction to Public Administration course became the pilot for PBL. Between 2016 and 2020, three more courses - General Theory of Administration, Fundamentals of Administration, and Corporate Governance - started applying PBL as a teaching method. EBAPE's aimed to use PBL in all courses, like FGV-EESP, by 2019, but this project was not fully successful, and part of the school's administration program still rely on traditional methods.

Description of PBL as a teaching method at EBAPE and EESP/FGV in Brazil

Regardless of the nuances presented by each implementation or institution, there is a basic process that characterizes the method. To organize the learning and discussion of problems, the methodology to solve the problem is separated into seven steps (Figure 1).

Figure 1 – The PBL process



Source: Elaborated by the authors based on a model presented in class to students at The Brazilian School of Public and Business Administration (FGV EBAPE) and on the model presented by the São Paulo School of Economics (FGV EESP).

Steps 1 through 5 occur during the pre-discussion, step 7 in the post-discussion and step 6 between the two.

For Souza (2012), the success of the learning process depends on several essential points. Professors must prepare students before the lesson by defining possible terms of the problem that may be unknown. Also, they must be prepared for the different paths that students may decide to follow.

According to Savin-Baden (2000), problem-based learning requires three essential conditions:

a) Focus on developing a problem-based curriculum that supports a broad, cross-curricular approach, and prioritizes learning cognitive skills over specific content;
b) Support and guidance from a tutor, work in small groups, and active learning;
c) Desired outcomes include the development of skills, motivation, and the capacity for lifelong learning.

Savin-Baden (2000) expects problem-based learning to result in:

a) Increased expertise in the content area;
b) Enhanced problem-solving skills and the ability to solve new and challenging problems;

c) Improved metacognitive skills, such as self-reflection;
d) Higher-order cognitive skills, such as decision making, critical thinking and creativity;
e) Ability to combine declarative and procedural knowledge.

According to Escrivão Filho and Ribeiro (2016), the most important characteristic of PBL, an active method focused on the student, is the fact that the case-problem precedes the exposure to fundamental concepts, allowing for the exploration of possible outcomes. Thus, the key aspect of PBL is using problems to introduce concepts and stimulate student debate, thereby enhancing their competencies and abilities.

Barrows (1996, p. 7) considers that challenges presented as relevant problems to students' future performance, before the presentation of the theory, are "the absolutely irreducible core of problem-based learning".

It is notable that this method model includes attributes from the McMaster model, where the course outline is guided by a series of problems, ranging from the simple to complex. The case problems serve as real-life examples of situations students will experience when they complete the programs.

Ribeiro (2008) establishes that regardless of the problem, the method has an obligation and must contain some peculiarities. The author discusses the main characteristic of PBL as follows:

a) It must be open-ended, allowing for multiple equally valid answers (even if there is no single correct answer, there should be a better solution);
b) It must be relevant to students' professional practice;
c) It must be easily found in professional settings.

The problems should reflect real-word situations to facilitate and stimulate students' evaluation and judgment. They should also be in accordance with students' cognitive, motor, and affective levels. It is essential for students to feel challenged while solving these problems.

For Escrivão Filho and Ribeiro (2016), the most pronounced characteristic of PBL is how the problem is structured to allow for multiple paths of investigation. It is advised not to instruct the students on possible solutions to the problem. The challenge should lead them to deeper reflections, discussions, analyses, and solutions, thereby fostering the development of essential skills for their professional growth.

As noted by Barrows & Tamblyn (1980), the concept of problem-solving can be somewhat misleading, as many presented problems lack a single solution, or have multiple solutions. The key is not necessarily solving the problem itself. According to Kunst and Van Veen (1986), problems and cases are slightly different things. The authors argue that a case is different from a problem since it describes a particular situation designed to train students to apply previously learned knowledge from books or texts (KUNST; VAN VEEN, 1986). Despite these distinctions, PBL commonly incorporates both concepts of problems and problem-solving.

The problem situation resembles an enigma where there is no single correct answer and no pre-defined desire. Students are placed in situations that require them to seek answers.

PBL exhibits the following characteristics:

a) All students must engage in the various steps of the process, performing different functions and mental operations;
b) Respect for everyone's reasoning is essential, given that each participants contribution is fundamental;
c) Personal acquisition is identified based on the results obtained, and efforts are made to generalize them beyond their learning conditions;
d) Reflection during all activities and actions performed are encouraged;
e) Students learn how to understand the world around them.

Regarding the tasks to be performed, Barreto *et al.* (2007) classify the teacher's role and tasks in three phases: pre-active, before the session; active, during the session, and post-active, after the session.

In the pre-active phase, which refers to the period before the lesson, the teacher's role includes:

a) Studying and knowing the module content;
b) Knowing the available learning resources at the university (bibliographic, audiovisual, laboratory);
c) Understanding the module's problems and learning objectives;
d) Clarifying any doubts with the module coordinator;
e) Gathering information about participating students and their performance in previous groups.

In the second phase, during the lesson, the teacher's role, according to BARRETO *et al.* (2007), include:

a) Appointing/asking the group to appoint a leader and a secretary. This should occur in all lessons, during either the pre or post-activity of discussing the problem. The tutor must ensure that, throughout the module, all students take on both roles. At EBAPE, the tutor appoints the group's leader and secretary:
b) Assisting as needed, to ensure that the seven-step methodology is followed;
c) Supporting the activities of the group's leader and secretary, if necessary;
d) Facilitating students' discussion to achieve learning objectives, rather than lecturing on the problem's topic;
e) Ensuring a harmonious environment among students and with the tutor to encourage comfortable interaction;
f) Requiring students to present their researched sources before starting the final activities;
g) Conducting assessments with clear criteria.

According to Barreto *et al.* (2007), in the third and final phase, the professor's responsibilities are:

a) Holding weekly meetings with other tutors to discuss and critique the problems used in the lessons, and exchanging suggestions to improve the learning experience;
b) Providing individual constructive criticism to students;
c) Evaluating students (based on their participation and contributions).

After dividing the class into smaller groups, two students are randomly selected from each group, to play different roles. One will act as e the leader and the other will act as the secretary. The leader is responsible for guiding the group's discussions, mediating interactions, and ensuring everyone participates. The secretary writes down each one's opinion, asks questions, takes notes on the list of objectives to be achieved and researched, and, in the end, submits the report to the teacher and the group (SOARES, 2008).

Over time, students will adapt to PBL and will have the opportunity to rotate through different roles. They gain confidence in expressing their opinions and develop the ability to offer and receive constructive criticism to enhance both their performance and group work processes (SOARES, 2008).

Each group member should take turns in the role of leaders and secretaries. This rotation allows every student to experience being a leader, secretary, and active participant of the study group. This will enable them to experience diverse and perspectives, and to develop a comprehensive understanding of teamwork.

PBL and the Role of Professors/Tutors

Problem-based learning redefines the conventional role of professors from mere knowledge transmitters to tutors who guide students, mediate discussions, and guide group interactions (SOUZA, 2012). Tutors in PBL do not centralize the source of information but rather is the figure that foster learning by directing

reflections and interactions within the groups. They act as guides, aiming for collective development.

To effectively fulfill this new role, tutors must be comfortable addressing ambiguous real-world problems that lack ready-made solutions. Teaching PBL is more demanding than conventional textbook-based or case-based teaching and learning (UNGARETTI *et al.*, 2015).

The teacher should act as a guide, leading students through specific questions that will direct students to constructive thinking. Thus, these activities promote critical analysis, problem-solving skills, and the ability to communicate. This guidance process is not simple and requires even more preparation from the tutor.

Students will often face genuine dilemmas that can challenge even experienced tutors. Therefore, tutors are advised to adjust their expectations and to emphasize self-discovery in this learning process. According to Prof. Nakano (2019), each educational institution has the autonomy to create its own assessment criteria. For instance, at FGV EESP the assessment focuses on student's engagement in the lesson, encouraging them to clarify things they do not understand and ask pertinent questions. In PBL, tutors must access student's efforts to solve the problem and participate actively. This role requires encouraging students to formulate well-thought-out questions and narratives.

The toolbox for PBL tutors should include skills in critical thinking, analytical logic mapping, knowledge of content sources, and group processing dynamics to find answers. Equipped with those tools, tutors will feel comfortable admitting "I do not know the answer", followed by offering "but I have some good ideas on how to address the question". This shift emphasizes fostering students' learning skills over traditional lecture methods (UNGARETTI *et al.*, 2015).

For Dewey (1978), the initial stage of thinking is situational experience, involving attempts to accomplish something. Related to Piaget's teaching logic that learning is acting, the professor's role is to place students in diverse situations where they seek solutions on their own and construct their knowledge (FERREIRO; TEBEROSKY, 1986). The autonomy provided requires students not only to learn, but

also to learn how to explore. Simultaneously, the format of PBL intensely fosters teamwork and the development of related skills. Solutions are expected to be found in groups, with each student playing a role both inside and outside the classroom.

According to Savin-Baden (2000), the outcomes of PBL should foster good metacognitive skills, such as the ability for self-reflection. In addition, because PBL outcomes involve collaborative activities, students with differing viewpoints can, through reflection, adopt new perspectives and behaviors (LAVY; YADIN, 2010). Students reflect on their experiences and interpret and construct concepts, expanding their mental structures (SCHON, 2000).

It is also important for professors who are seeking to integrate PBL into their teaching to have a robust network of contacts in the corporate world for selecting pertinent problems (Ungaretti et al., 2015), as problem scenarios should relate to the professional environments. Proximity to real-world practice is essential, and a network of contacts in the job market facilitates the implementation of new content.

Applied PBL: Practical Example in a Course of Research Methodology

This section presents a course on active methodologies taught in a master's program. The objective is to present a practical example applicable to undergraduate or graduate programs in management ration for research methodology courses applying PBL.

Teaching through the case method has a long history. In the field of education, Dewey emphasized the importance of associating content with reality, that is, with the real world (NATH, 2005). Harvard Business School in the early 1900s initially employed the problem method, a precursor of the case method, by inviting executives to present concrete problems to students during classes. The case method was formally implemented at the Harvard Business School in 1924, , inspired by Harvard's Law School's courses. Since then, it has been widely adopted

in various Business Administration courses around the world (CAMPOMAR; IKEDA; VELUDO DE OLIVEIRA, 2003; IIZUKA, 2008).

It should be noted, however, that despite the recognition of the case study method developed at Harvard, there are several other types of case studies aimed at teaching, ranging from illustrative scenarios serving defined purposes to specific examples of behavioral and cultural practices observed in everyday life.

Based on real-life situations, educators often create summarized case descriptions of 1-5 pages, usually followed by a limited number of discussion/reflection questions (IIZUKA, 2008). According to this author, that methodology allows professors to present and discuss concepts related to reality and has been widely used in textbooks, book chapters, and teaching notes across various teaching domains, including administration.

The case study presented below provides a direct and succinct illustration of our everyday life situations, enabling the teacher to explore important concepts of research methodology, in addition to fostering more participative, inquisitive, and reflective student engagement.

LESSON OBJECTIVE:

Demonstrate to students that PBL seeks to solve problems using prior experience. Every academic study using PBL begins with a problem. Students will learn that through PBL practice, they can undertake different projects either in academia or in the job market.

PBL IMPLEMENTATION:

In a tutorial class, students are presented with problems, and they will discuss learning objectives aimed at helping to identify the necessary teaching resources to solve each problem. One of the main challenges for students is

organizing their prior knowledge about the presented issues. On the other hand, students are encouraged to seek more information and knowledge related to the lessons' topics. Each group designates a leader in charge of conducting/organizing the activities. After the previous discussion, tutors assist students in their tasks of demonstrating their understanding of the problem and submitting it to classroom debate. At this stage, students are expected to rely on the recommended literature to solve problems. Professors participate in the discussions by guiding and providing examples relevant to the topic.

THE PROBLEM:

Students will be able to choose a more theoretical or intuitive path, but in the end, they need to coordinate and understand how to connect ideas to solve problems.

PROPOSED PROBLEM:

Theme:

The Limits of Science.

Problem Description:

Analyze Drauzio Varela's text and reflect on the relationship between common knowledge and science, emphasizing their proximity and differences in explaining reality.

Initial Reading:

https://www1.folha.uol.com.br/fsp/ilustrad/fq0202200821.htm

Questions:

Q. 1 Why does this go beyond the boundaries of common knowledge?

Q. 2 Should scientists have the same moral considerations as a taxi driver? In other words, should scientists place her/his beliefs/morals over analyzed facts?

Q.3 Should social and human problems be approached with the same objectivity as exact sciences?

Important bibliography (in Portuguese):

ALVES, R. Em busca de ordem. *In*: ALVES, R. **Filosofia da Ciência**: introdução ao jogo e suas regras. 10. ed. São Paulo: Editora Brasiliense, 1987. p. 36-53.

Text discussion: CHALMERS, A. F. Teorias como estrutura os paradigmas de Kuhn. *In*: CHALMERS, A. F. O que é ciência afinal? São Paulo: Editora Brasiliense, 1983.

Learning Objectives:

Analyze the differences between common knowledge and science.

Question Suggestions:

What is science? Does science represent the truth? Is it possible to create adequate and effective methods for the reality of applied social sciences? Can the social and human sciences, by following moral and value analyzes, always forego quantitative resources since the important lies in qualifying the analyzed data and information? Are case studies sufficient for knowledge production in social sciences? If so, can information be generalized to other companies analyzed? Can social scientists formulate hypotheses even when conducting qualitative research?

Elaborated answer:

Q.1 Make it clear that knowledge must extend beyond individual experience.

Q.2 Analyze the different criteria defining scientific knowledge.

Q.3 Every researcher goes through the process of defining research objectives, hypotheses, methodology, as well as selecting appropriate theoretical approaches for understanding the object of study. The results extracted from a study do not necessarily match the researchers' values. Theoretical and empirical premises and hypotheses must follow a neutral path, independent of personal beliefs, as this is a way to remain faithful to facts.

In summary, the PBL method focuses on problem-solving, making students active players in knowledge acquisition. Successful PBL not only surpasses the traditional approach. It also requires a transformation of students' experiences, concerns, and points of view. Authentic PBL classes seek to give direct address to students' concerns, with the tutor's assistance. Students' experiences, concerns, and points of view are at the core of classroom activities, acknowledged, validated, and problematized by the tutor.

Conclusion

When proposing education as a practice of freedom, Paulo Freire (1975) argues that education should not involve merely depositing content into empty beings but should instead problematize human existence based on to how we live in the world. For this reason, a *problematizing education* is based on the dialogical relationship between educator and student, which enables both to learn together through an emancipatory process.

People learn in distinct and unique ways, so there is no single teaching method suitable for every person. Teaching and learning will always offer countless opportunities, making this process fascinating, yet challenging. After all, it is difficult to mobilize people to fully develop their potential and evolve.

Traditional education can be combined and coexist with inductive teaching methodologies that encourage the students to experiment and inquire in class,

fostering deeper and more holistic understanding. Therefore, this work aims to encourage institutions and professors to be bold and test new teaching models.

In sum, integrating or fully implementing one or more alternative teaching methodologies will allow students to develop their skills through a real-world approach to classroom learning.

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