

Problem-based learning supported by the Be Active platform in higher education: potential, challenges, and perceptions of Business Administration students¹

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ABSTRACT

This article analyzes the implementation of Problem-Based Learning (PBL), supported by the Be Active platform, in a Business Accounting course within a Business Administration program. The study aimed to understand how this methodology, implemented in a digital environment, fostered student learning and collaboration, highlighting its potential, challenges, and perceived contributions. This article reports findings from a qualitative, intervention-oriented study conducted through participant observation, document collection, and questionnaires. Data were analyzed through triangulation of different sources of evidence, integrating Similarity Analysis, Prototypical Analysis, interpretive analysis of qualitative data, and cross-analysis of variables. The results revealed potential related to the organization of the inquiry process, the integration of theory and practice, engagement in inquiry, and student collaboration, as well as challenges associated with adapting to the methodology and the need for continuous pedagogical mediation.

KEYWORDS: Problem-Based Learning (PBL). Higher education. Digital platforms. Business Accounting. Digital technologies in education.

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Aprendizagem baseada em problemas com suporte da plataforma Be Active no ensino superior: potencialidades, desafios e percepções de estudantes de Administração

RESUMO

Este artigo analisa a implementação da Aprendizagem Baseada em Problemas (ABP), com suporte da plataforma Be Active, na disciplina de Contabilidade Empresarial do curso de Administração. O objetivo foi compreender como essa metodologia, desenvolvida em ambiente digital, favoreceu a aprendizagem e a colaboração entre estudantes, evidenciando suas potencialidades, desafios e contribuições percebidas pelos participantes. Trata-se de um recorte de uma pesquisa qualitativa e de caráter interventivo, realizada com observação participante, coleta documental e aplicação de questionários. Os dados foram analisados por triangulação das diferentes fontes de evidência, com articulação entre Análise de Similitude, Análise Prototípica, análise interpretativa dos dados qualitativos e cruzamentos entre variáveis. Os resultados indicaram potencialidades ligadas à organização do percurso investigativo, à aproximação entre teoria e prática, à mobilização da pesquisa e à colaboração, além de desafios relacionados à adaptação à metodologia e à necessidade de mediação pedagógica constante.

PALAVRAS-CHAVE: Aprendizagem Baseada em Problemas (ABP). Educação superior. Plataformas digitais. Contabilidade empresarial. Tecnologias digitais na educação.

Aprendizaje basado en problemas con apoyo de la plataforma Be Active en la educación superior: potencialidades, desafíos y percepciones de estudiantes de Administración

RESUMEN

Este artículo analiza la implementación del Aprendizaje Basado en Problemas (ABP), con apoyo de la plataforma Be Active, en la asignatura de Contabilidad Empresarial del curso de Administración. El objetivo fue comprender cómo esta metodología, desarrollada en un entorno digital, favoreció el aprendizaje y la colaboración entre estudiantes, evidenciando potencialidades, desafíos y contribuciones percibidas por los participantes.

Se trata de un recorte de una investigación cualitativa, de carácter interventivo, realizada mediante observación participante, recolección documental y aplicación de cuestionarios. Los datos fueron analizados mediante la triangulación de fuentes de evidencia, con articulación entre análisis de similitud, análisis prototípico, análisis interpretativo de los datos cualitativos y cruces entre variables. Los resultados indicaron potencialidades vinculadas a la organización del recorrido investigativo, la aproximación entre teoría y práctica, la movilización de la investigación y la colaboración, además de desafíos relacionados con la adaptación a la metodología y la necesidad de mediación pedagógica constante.

PALABRAS CLAVE: Aprendizaje Basado en Problemas (ABP). Educación superior. Plataformas digitales. Contabilidad empresarial. Tecnologías digitales en la educación.

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Introduction

Transformations in higher education have intensified the debate over the need to move beyond pedagogical practices centered on content transmission and passive student participation. In professionally oriented programs such as Business Administration, this discussion is particularly relevant, since the educational process requires not only conceptual knowledge but also analytical skills, decision-making, problem-solving, and teamwork (Brasil, 2007; Brasil, 2023; Chiavenato, 2022; Leal; Miranda; Casa Nova, 2019).

In this context, active learning methodologies have been understood as approaches capable of reorganizing teaching and learning by promoting greater student agency and stronger connections between theory and practice (Moran, 2012; Leal; Miranda; Casa Nova, 2019; Nogueira et al., 2020). Among these methodologies, Problem-Based Learning (PBL) stands out for structuring learning around problem situations that engage students in inquiry, hypothesis formulation, information seeking, and the collaborative construction of responses (Barrows; Tamblyn, 1980; Schmidt,

1983; Savery; Duffy, 1995; Mamede, 2001; Ribeiro, 2019). The literature has recognized its potential to promote meaningful learning and intellectual autonomy, although its implementation requires consistent instructional planning and pedagogical mediation (Araújo et al., 2016; Frezatti et al., 2018; Munhoz, 2019; Hmelo-Silver, 2004).

At the same time, the incorporation of digital technologies into educational processes has reshaped forms of interaction, monitoring, and the organization of pedagogical work. However, their effects depend on their alignment with learning objectives, activity structure, and pedagogical mediation; therefore, the incorporation of these technologies does not, in itself, constitute innovation (Hernandes; Sousa, 2024; Hernandez; Sousa, 2026; Borges; Sousa, 2024). Within the context of active learning methodologies, this integration can increase the visibility of the inquiry process and foster student collaboration, provided that it is supported by a coherent pedagogical design.

This article derives from a master's dissertation that investigated the use of Problem-Based Learning, supported by the Be Active platform, in a Business Accounting course within a Business Administration program. Accordingly, the study seeks to understand how this integration was pedagogically implemented in a concrete higher education experience, considering its contributions to student learning and collaboration, as well as the limitations observed during the implementation process (Hernandes, 2023).

Against this background, the following research question was formulated: To what extent does the integration of Problem-Based Learning with a digital platform such as Be Active foster student learning and collaboration in higher education, and what limitations and challenges emerge from this process?

The relevance of this study lies in the need to analyze, from a pedagogical perspective, the conditions that foster or constrain the potential of active learning methodologies mediated by digital technologies within specific disciplinary contexts. The study is grounded in the understanding

that the pedagogical contributions of digitally supported PBL depend on the coherence among the proposed problem, the organization of the inquiry process, pedagogical mediation, and the forms of student participation.

From this perspective, the article aims to analyze how the implementation of PBL through the Be Active platform fostered student learning and collaboration, identifying its potential, challenges, and contributions as perceived by the participants (Hernandes, 2023). This article presents a specific component of a qualitative, intervention-oriented study whose data were analyzed through triangulation of different sources of evidence, integrating Similarity Analysis, Prototypical Analysis, interpretive analysis of qualitative data, and cross-analysis of variables. The article is organized into the following sections: theoretical framework, methodology, results and discussion, followed by the conclusion.

Theoretical framework

Pedagogical practices in higher education and in Business Administration programs

Discussions on pedagogical practices in higher education indicate that university education cannot be limited to the transmission of decontextualized content, particularly in professionally oriented programs. In the field of Business Administration, academic education requires competencies related to problem analysis, decision-making, communication, and teamwork, which calls for more dynamic, contextualized, and participatory teaching practices (Chiavenato, 2022; Ching et al., 2020; Leal; Miranda; Casa Nova, 2019).

The development of Business Administration education in Brazil reflects a process of expansion and diversification marked by curricular regulation and challenges related to the quality of educational practices. The National Curriculum Guidelines emphasize the need to integrate technical

education, analytical skills, and critical professional practice, showing that curricular organization alone does not ensure the implementation of pedagogical practices aligned with these demands (Pinto; Motter Junior, 2012; Brasil, 2007; Brasil, 2023).

In this sense, the debate on innovation in higher education shifts from curricular prescriptions to the analysis of practices effectively mobilized in teaching and learning processes. In this context, active learning methodologies emerge as possibilities for reorganizing the educational experience by promoting greater student engagement and stronger connections between academic knowledge and concrete situations of professional practice (Moran, 2012; Leal; Miranda; Casa Nova, 2019; Nogueira et al., 2020).

This discussion is also linked to the growing presence of digital technologies in higher education, understood not merely as instrumental resources, but as elements that reshape educational practices and pedagogical mediation. In this context, understanding how these dimensions interact in everyday disciplinary practices becomes central to analyzing the limitations and possibilities of educational approaches in higher education (Hernandes; Sousa, 2024; Hernandez; Sousa, 2026).

PBL: foundations, potential, and limitations

Problem-Based Learning (PBL) is a student-centered methodology structured around the analysis of problem situations that guide the learning process. Unlike approaches based on the linear presentation of content, PBL engages students in identifying knowledge gaps, formulating hypotheses, seeking information, and collaboratively constructing evidence-based responses (Barrows; Tamblyn, 1980; Schmidt, 1983; Barrows, 1986; Savery; Duffy, 1995).

Its foundations are aligned with constructivist and experiential perspectives on learning, according to which knowledge emerges from the learner's engagement with concrete challenges, mediated by social interactions and reflective processes (Dewey, 1979; Piaget; Inhelder, 1974;

Mamede, 2001). Within this logic, the problem is not merely a teaching resource, but the structuring element of the educational process, as it integrates inquiry, different forms of knowledge, and meaning-making (Savin-Baden; Major, 2004; Ribeiro, 2019).

The literature has indicated that PBL can foster meaningful learning, intellectual autonomy, and the development of collaborative skills, especially in fields that require the analysis of complex situations and decision-making, such as Business Administration and Accounting (Araújo et al., 2016; Hmelo-Silver, 2004; Frezatti et al., 2018; Munhoz, 2019). At the same time, its implementation should not be viewed as an automatic solution to the challenges of higher education, as it requires consistent instructional planning, organization of group work, time management, and a redefinition of the teacher's role as a mediator of learning (Colliver, 2000; Ribeiro, 2019; Munhoz, 2019).

In contexts mediated by digital technologies, these requirements become even more evident. Recent studies show that collaboration in PBL does not occur spontaneously and requires monitoring strategies, regulation of participation, and the intentional organization of activities (Zhu; Zhang, 2023). In addition, digital collaborative environments can enhance interaction and knowledge sharing, provided that they are integrated into a coherent pedagogical design (Lin; Wang, 2024; Cong; Ironsi, 2025). Thus, PBL supported by digital technologies requires not only access to technology, but also its integration into a pedagogical approach capable of sustaining inquiry, collaboration, and knowledge construction.

Technological mediation and the Be Active platform

The incorporation of digital technologies in higher education has been associated with expanded possibilities for interaction, the organization of pedagogical work, and the monitoring of learning. However, their educational contribution depends on how these resources are integrated into the

instructional design and pedagogical mediation strategies (Valente, 2019; Moran, 2015; Hernandez; Sousa, 2024; Hernandez; Sousa, 2026).

From this perspective, technological mediation is not limited to the instrumental use of digital tools, but involves the integration of technology, learning objectives, activity organization, and the monitoring of the educational process. Within PBL, this discussion is particularly relevant because the methodology requires continuous monitoring, the organization of collaborative work, and the documentation of the inquiry process. Recent studies indicate that digital environments can support these processes by increasing the visibility of the stages of learning and student interactions, provided that they are structured coherently with the pedagogical approach (Zhu; Zhang, 2023; Lin; Wang, 2024).

It is within this context that the Be Active platform is situated, conceived as a digital environment designed to support active learning methodologies. In the study from which this article derives, the use of the platform was associated with the organization of the PBL pedagogical process, particularly the distribution of tasks, the monitoring of the stages of the problem, and the documentation of students' work, thereby playing a mediating role in the development of the pedagogical approach (Be Active, 2022; Hernandez, 2023).

This dimension is relevant because it shows that the platform functioned not merely as technical support, but as part of the structuring of the educational process, making the stages of the activity, the interactions, and the participants' contributions more visible. Nevertheless, as the literature indicates, the presence of technology does not eliminate challenges related to student engagement, appropriation of digital tools, and teacher monitoring, which reinforces the need to integrate digital resources with the pedagogical approach (Cong; Ironsi, 2025; Al-Jarf, 2026).

Methodology

This article derives from a qualitative, intervention-oriented study conducted in a Business Accounting course within a Business Administration program, focusing on the implementation of PBL through the Be Active platform. The qualitative approach was considered appropriate because it enabled an understanding of the meanings participants attributed to the pedagogical experience, as well as an analysis of the processes, interactions, and perceptions constructed throughout the intervention (Triviños, 1987; Garnica, 1997; Gil, 2008).

The intervention-oriented nature of the study stems from the intentional implementation of the methodology in the course, with systematic monitoring by the researcher throughout the process (Miranda et al., 2016; Damiani et al., 2013). The study was conducted with second-semester Business Administration students at a university in the interior of the state of São Paulo, using a problem related to accounting management within the context of business administration, designed to connect course content with a concrete situation for analysis.

Data production was based on participant observation, document collection, and the administration of questionnaires. The instruments used included the Free Word Association Technique (FWAT) (Lima; Bú, 2017), Kolb's Learning Style Inventory (Cerqueira, 2008), and a questionnaire on PBL. Participant observation made it possible to monitor the development of the methodology and student participation; document collection focused on materials produced on the Be Active platform, such as records of the problem, team formation, the PBL chart, the discussion forum, problem solving, and self-assessment; and the questionnaires gathered data on perceptions, learning styles, and representations associated with the experience.

Data analysis was guided by the principle of triangulation, integrating the different sources of evidence generated throughout the study. Records from participant observation, documents produced on the platform, and students'

discursive responses were examined interpretively to identify convergences, divergences, and recurring aspects related to the implementation of PBL, its pedagogical potential, and the challenges observed. These data were integrated with the results of Similarity Analysis, Prototypical Analysis applied to data from the FWAT, and cross-analysis of objective variables from the PBL questionnaire (Donato et al., 2017; Lima; Bú, 2017). To clarify the relationship among the article's analytical objectives, data production instruments, and analytical procedures, Box 1 is presented below.

BOX 1: Relationship among analytical objectives, data production instruments, and analytical procedures.

Analytical objectives of the article	Data production instruments	Empirical material analyzed	Analytical procedures
Analyze the implementation of PBL supported by the Be Active platform in the Business Accounting course	Participant observation; document collection	Observation protocol; platform records; team formation; problem solving; interactions in the digital environment	Interpretive analysis and triangulation of evidence
Identify the pedagogical potential of digitally supported PBL	Participant observation; PBL questionnaire; document collection	Student responses; participation records; documents produced on the platform	Interpretive analysis; cross-analysis of variables; and triangulation of evidence
Identify challenges observed in the implementation of the methodology	Participant observation; PBL questionnaire	Process records; students' perceptions of difficulties; data on satisfaction and participation	Interpretive analysis; cross-analysis of variables; and triangulation of evidence
Describe students' perceptions of the contributions of PBL to learning and collaboration	PBL questionnaire; FWAT	Closed-ended and discursive responses; free word associations	Prototypical Analysis; Similarity Analysis; cross-analysis of variables
Understand aspects of participants' learning within the context of the experience	Kolb's Learning Style Inventory	Data related to learning styles	Descriptive analysis and interpretation integrated with the other data

Source: Adapted from the author's master's dissertation (Hernandes, 2023).

As shown in Box 1, the methodological organization of the study integrated objectives, instruments, and procedures consistent with the phenomenon under investigation. In this article, the analysis focuses on

data related to the implementation of digitally supported PBL, the potential and challenges observed, and students' perceptions of the methodology's contributions to learning and collaboration. This analytical focus preserves coherence with the original design of the master's dissertation while allowing one of the study's central analytical strands to be examined in greater depth in article format.

Results and discussion

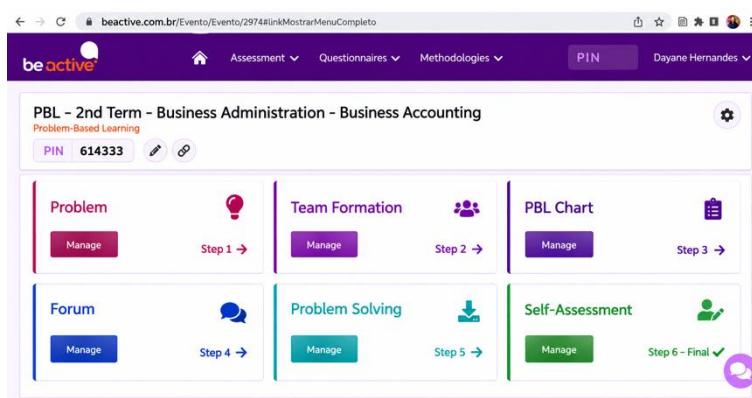
Implementation of PBL in the Business Accounting course with support from the Be Active platform

The implementation of PBL in the Business Accounting course was structured as a planned intervention supported by the Be Active platform and guided by a real-world problem related to accounting management in the context of business administration. As described in the master's dissertation, the problem was designed with an emphasis on accounting theory and the professional practice of Business Administration, and its development was based on materials addressed throughout the course, including texts, legislation, videos, and news reports related to the topic under study (Hernandes, 2023).

This finding is relevant because it shows that PBL was not introduced as an isolated activity or one disconnected from the curriculum, but rather as a strategy integrated with the course content and professional practice. This form of implementation is consistent with the literature that conceptualizes PBL as a methodology centered on meaningful problems, whose purpose is to promote inquiry, collaboration, and the integration of theory and practice (Barrows; Tamblyn, 1980; Schmidt, 1983; Savery; Duffy, 1995; Ribeiro, 2019). In the fields of Business Administration and Accounting, this integration can foster more contextualized learning that is closely connected to concrete situations of professional practice (Martins; Espejo, 2015; Frezatti et al., 2018; Shawver, 2015).

The organization of the activity within the digital environment can be understood through the interface used to implement the pedagogical approach. Figure 1 shows that the Be Active platform functioned not merely as technical support, but as a space for pedagogical mediation in which the stages of PBL, records of the inquiry process, and student interactions were organized. In this way, its use helped make the organization of collaborative work and the monitoring of problem resolution more visible, reinforcing the integration of the active learning methodology, course content, and technological mediation.

FIGURE 1: Be Active platform interface during the implementation of PBL.



Source: Extracted from the author's master's dissertation (Hernandes, 2023).

The master's dissertation further indicates that the methodology was implemented by the researcher in accordance with the stages of PBL, with the Be Active platform used as a digital environment to support the intervention. Throughout the process, records of the problem, team formation, the PBL chart, the discussion forum, problem solving, and self-assessment were used and also formed part of the study's empirical corpus. This organization shows that the platform did not function merely as technical support, but also mediated the instructional dynamics by helping structure the inquiry process and monitor student participation at different stages of the activity (Hernandes, 2023).

From a pedagogical perspective, this design supports the argument advanced by Hernandez and Sousa (2024) and Hernandez and Sousa (2026) that the incorporation of digital technologies acquires educational meaning only when guided by clear pedagogical intentions. In this study, the Be Active platform was integrated into the implementation of the methodology by supporting process documentation, the circulation of information, and the organization of collaborative work. This finding is also consistent with Borges and Sousa (2024), who argue that the integration of PBL and Digital Information and Communication Technologies (DICT) can strengthen the inquiry-based and collaborative dimensions of the learning experience.

In this sense, the implementation observed in the Business Accounting course suggests that the combination of a real-world problem, pedagogical mediation, and a structured digital environment expanded the conditions for developing a more active pedagogical experience. Rather than centering learning exclusively on content presentation, the approach required students to engage in a process of inquiry, discussion, and response construction, consistent with the principles of PBL and the educational needs of the Business Administration program (Araújo et al., 2016; Munhoz, 2019; Nogueira et al., 2020).

Pedagogical potential of digitally supported PBL

The research findings indicate that the PBL experience mediated by the Be Active platform demonstrated relevant pedagogical potential within the context of the course investigated. This potential included the organization of the learning process, the promotion of student collaboration, the mobilization of inquiry around a concrete problem, and stronger connections between academic content and professional situations. The structure of the materials generated throughout the process, such as the PBL chart, discussion forum, problem solving, and self-assessment, also suggests that the approach supported different forms of participation and facilitated the monitoring of students' work. This finding is consistent with the literature

that conceptualizes PBL as a methodology capable of fostering autonomy, inquiry, collective knowledge construction, and the integration of prior knowledge with content addressed throughout the educational process (Hmelo-Silver, 2004; Frezatti et al., 2018; Munhoz, 2019).

In addition, the results of the Prototypical Analysis provide important insights into how students represented the methodology. The term “resolution” emerged as a salient evocation, while “responsibility,” “research,” and “public bidding” were also associated with PBL, although with different degrees of centrality. These findings suggest that participants associated the methodological experience with the resolution of concrete problems, responsibility for the process, and research as a component of learning.

To present the organization of these evocations more objectively, Table 1 is provided based on the Prototypical Analysis according to Vergès’ four-quadrant framework (Wachelke; Wolter; Matos, 2016). In this analysis, one of the criteria considered is the Mean Order of Evocation (MOE), an indicator related to the average position in which each term was evoked by the participants. This systematization makes it possible to identify the most salient terms within the participants’ representational field, highlighting more central and peripheral elements associated with the methodology.

TABLE 1: Prototypical analysis of PBL-related evocations based on Vergès’ four-quadrant framework.

	MOE ≤ 3.19			MOE > 3.19		
$f \geq 3$	Evocation Resolution	f 6	MOE 3.17	Evocation Responsibility	f 2	MOE 5
$f < 3$				Evocation Research Public bidding	f 2 2	MOE 3 1.5

Source: Extracted from the author’s master’s dissertation (Hernandes, 2023).

As shown in Table 1, the evocations associated with PBL refer to dimensions that extend beyond the simple completion of an activity, linking the methodology to elements such as problem resolution, research,

responsibility, and practical contextualization. These findings reinforce the interpretation that students perceived the experience as an inquiry-based and applied process connected to concrete situations in the field, supporting the identification of the pedagogical potential of digitally supported PBL.

This association reinforces one of the main strengths of PBL: the shift from a model centered on the reception of content to one that requires students' active engagement in analyzing situations and seeking well-founded responses (Savin-Baden; Major, 2004; Ribeiro, 2019). In the specific context of the Business Accounting course, the emergence of the term “public bidding” also indicates a strong contextual grounding of the activity, since the problem addressed involved a public procurement process, revealing a close connection between the methodology and the professional context explored in the course.

Another important point is that the digital platform helped make the learning process more visible by documenting its stages, interactions, and group outputs. This expanded the possibilities for teacher monitoring and supported the systematization of the experience, which is consistent with the discussion by Borges and Sousa (2024) on the potential of DICT to enhance the conditions for inquiry, communication, and collective knowledge production in PBL approaches. To synthesize the main positive aspects identified during the implementation of the approach, Box 2 is presented below.

BOX 2: Pedagogical potential of PBL supported by the Be Active platform.

Dimension	Empirical evidence	Analytical interpretation
Organization of learning	Problem records, PBL chart, discussion forum, problem solving, and self-assessment	The platform supported the structuring of the inquiry process and the monitoring of the stages of the activity
Connection with real-world situations	Problem developed based on accounting management and public procurement	The methodology brought academic content closer to concrete demands of professional practice
Student collaboration	Team formation, interaction in the digital environment, and participation records	The approach fostered collaborative work and the shared construction of responses
Mobilization of inquiry	Evocations such as “research” and “resolution” in the Prototypical Analysis	Students associated PBL with inquiry and problem resolution

Dimension	Empirical evidence	Analytical interpretation
Student responsibility	Evocation of “responsibility” and the use of self-assessment	The experience required greater student commitment to the learning process

Source: Prepared based on the author’s master’s dissertation (Hernandes, 2023).

Taken together, Table 1 and Box 2 show that the pedagogical potential of digitally supported PBL extended beyond the completion of a specific task, encompassing an inquiry-based, collaborative, and contextualized learning experience. The findings indicate that students associated the methodology with central elements of the educational process, such as problem resolution, research, and responsibility, while the organization of the platform supported the monitoring of the different stages, group interaction, and closer connections between theory and practice. Thus, the experience analyzed reinforces the potential of PBL mediated by a digital environment to enhance teaching and learning processes in higher education.

Challenges and limitations observed during implementation

Although the findings indicate relevant potential for digitally supported PBL, the experience investigated also revealed challenges that need to be considered. The study itself shows that students’ perceptions of the methodology were not homogeneous and that the contributions of the approach depend on pedagogical adaptations capable of accommodating different learning profiles and forms of participation. This interpretation is reflected in the study’s synthesis, which indicates that the variability in students’ perceptions suggests the need for adjustments to the methodological approach in order to broaden its reach and pedagogical contributions.

In this study, consistent with the literature that problematizes PBL as an approach whose contributions depend on pedagogical mediation, process organization, and the context of implementation (Colliver, 2000;

Ribeiro, 2019; Munhoz, 2019), the challenges can be interpreted across four dimensions: adaptation to the logic of the methodology, heterogeneity in forms of participation, pedagogical use of the platform, and management of collaborative work.

Box 3 summarizes the limitations observed in the study, showing how they manifested throughout the process and the resulting pedagogical implications.

BOX 3: Summary of challenges observed in the implementation of digitally supported PBL.

Observed challenge	Manifestation in the study	Pedagogical implications
Adaptation to the methodology	Heterogeneous student perceptions regarding the contributions of PBL	Need for more systematic guidance on the rationale underlying the approach
Different forms of participation	Not all students engaged with the methodology in the same way	Importance of pedagogical mediation attentive to the specific characteristics of the group
Pedagogical use of the platform	Technology needed to be integrated with the methodological design so that it would not be reduced to operational support	Need to align the digital resource, the proposed problem, and the learning objectives
Management of collaborative work	The approach required task distribution, dialogue, and shared responsibility among participants	Relevance of strategies for monitoring, organization, and self-assessment

Source: Prepared based on the results of the author's master's dissertation (Hernandes, 2023).

As shown in Box 3, the challenges identified are not limited to the methodology itself, but also involve how it is appropriated by students and pedagogically mediated within the course context. Adapting to the logic of PBL requires participants to understand that learning is organized not merely around the reception of content, but through inquiry, collaboration, and the progressive construction of responses. When this shift in logic is not adequately supported, it may give rise to uncertainty, resistance, and less favorable perceptions of the approach.

The heterogeneity in forms of participation indicates that students' experiences were not uniform, reinforcing the need for pedagogical mediation that is sensitive to the specific characteristics of the group. This finding is consistent with Borges and Sousa (2024) and Hernandez and

Sousa (2026), as it shows that the integration of active learning methodologies and DICT requires consistent planning and careful attention to the actual dynamics of student engagement.

Regarding the use of the platform, the findings show that its contribution depended on the alignment among the proposed problem, the learning objectives, and teacher monitoring. This confirms that technology alone does not ensure pedagogical quality but can strengthen the approach when integrated into a coherent instructional design (Hernandes; Sousa, 2024; Borges; Sousa, 2024).

Finally, the management of collaborative work emerged as a central dimension among the challenges observed. Task distribution, the shared construction of responses, and shared responsibility among participants required continuous organization and monitoring. In this context, the use of self-assessment and process records on the platform constituted an important element for monitoring group dynamics and providing greater visibility into the learning process.

Taken together, these findings indicate that the limitations observed in the implementation of digitally supported PBL do not invalidate the methodology, but rather highlight the need for ongoing monitoring, refinement, and adaptation to the specific context. Its pedagogical contributions depend on the alignment among instructional organization, teacher monitoring, and the coherent integration of digital resources into the pedagogical approach.

Students' perceptions of the contributions of PBL to learning and collaboration

One of the central analytical dimensions of this article concerns students' perceptions of the contributions of PBL to learning and collaboration. In this analytical focus, the indicators most directly related to the objective of the subsection were selected: satisfaction with the use

of the methodology in the learning process, satisfaction with the working group, comparison with the traditional method, and willingness to recommend PBL. Taken together, these data provide a more objective understanding of how participants evaluated the approach in its pedagogical and collaborative dimensions.

The findings indicated a predominance of positive evaluations regarding the use of PBL in the learning process, although these evaluations were not homogeneous (Hernandes, 2023). A favorable perception of group work was also observed, although it was characterized by different levels of participation. When compared with the traditional method, evaluations indicating equivalence or a slight advantage of PBL predominated, although there was no consensus among students. Similarly, students' willingness to recommend PBL was predominantly favorable, although moderate (Hernandes, 2023).

These findings suggest that the experience was perceived as pedagogically relevant, although not uniformly so. This result reinforces the understanding that the contributions of PBL depend not only on the methodological approach itself, but also on the concrete conditions of pedagogical mediation, instructional organization, and the ways in which students engage with the inquiry-based and collaborative dynamics. In this sense, students' perceptions reinforce the potential of the methodology in higher education while also highlighting the need for pedagogical support that is sensitive to the specific characteristics of the group (Hmelo-Silver, 2004; Borges; Sousa, 2024).

To synthesize these perceptions, Box 4 brings together the dimensions analyzed and the predominant trends identified in the data.

BOX 4: Summary of students' perceptions of the contributions of PBL to learning and collaboration.

Dimension	Predominant perceptions
Learning	Fosters applied understanding and problem-solving
Group work	Promotes collaboration, although participation was unequal
Comparison with the traditional method	Perceived as equivalent or slightly superior
Recommendation of the methodology	Predominantly positive
Challenges	Adaptation to the methodology and group organization

Source: Prepared based on Hernandes (2023).

Taken together, the results discussed throughout this section indicate that the implementation of PBL supported by the Be Active platform fostered a more participatory, inquiry-based, and contextualized learning experience. At the same time, they revealed that its pedagogical potential is directly related to the quality of pedagogical mediation, the coherence of the instructional design, and the forms of student participation throughout the process.

Conclusion

This article aimed to analyze the implementation of PBL, supported by the Be Active platform, in the Business Accounting course, considering its pedagogical potential, challenges, and contributions as perceived by students. The findings indicated that the integration of an active learning methodology with digital mediation constituted a pedagogically relevant experience by supporting the organization of the inquiry process, strengthening the connection between theory and practice, mobilizing inquiry, and fostering the collective construction of responses.

The analysis also showed that the contributions of the approach were not perceived uniformly. The different forms of participation, the need to adapt to the logic of PBL, and the importance of pedagogical mediation demonstrated that the educational potential of the methodology depends on well-structured instructional conditions and attentive teacher support. In

this sense, the findings reinforce the understanding that technology does not constitute an autonomous driver of innovation, but rather a component of a pedagogical architecture that can enhance – or constrain – the educational potential of the approach.

It can therefore be concluded that the implementation of PBL supported by the Be Active platform contributed to a more participatory, inquiry-based, and contextualized learning experience. The study also offers a relevant analytical contribution to understanding the pedagogical conditions involved in implementing PBL mediated by digital technologies in higher education. Beyond demonstrating the pedagogical potential of the methodology, the findings support the conclusion that its contributions in digitally mediated contexts depend on the alignment among the proposed problem, pedagogical mediation, the organization of the learning process, and student participation.

As a limitation, this article focused on a specific analytical component of the master's dissertation from which it derives, addressing the pedagogical potential, challenges, and students' perceptions of the implementation of digitally supported PBL (Hernandes, 2023). Future studies may explore other dimensions of the experience in greater depth, particularly the relationships among digital mediation, learning, and collaboration across different educational contexts.

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