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PROJECT-BASED LEARNING IN THE EDUCATIONAL PRACTICES OF BEGINNER TEACHERS[1]

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ABSTRACT: The beginning of a teacher's career is a challenging period for the development of their educational practices. Despite valuing active teaching methods, such as Project-based Learning, the pressure felt at this stage leads teachers at the beginning of their careers to experience difficulties of a diverse nature in its implementation. This study aims at understanding how elementary school teachers at the beginning of their career, integrate Project-based Learning in their teaching practices. Data were collected through semi-structured interviews with eight teachers and documental analysis of their teaching materials. The results show that beginner teachers value and try to implement Project-based Learning in their educational practices. The difficulties in its implementation could be mitigated through a more consistent methodological approach in initial teacher education and a redefinition of educational priorities at the schools where they teach, which overloads beginner teachers with too many parallel tasks to the teaching service.

Keywords: project-based learning, educational practices, induction phase, elementary school teachers.

O TRABALHO DE PROJETO NAS PRÁTICAS EDUCATIVAS DE PROFESSORES EM INÍCIO DE CARREIRA

RESUMO: O início de carreira de um professor é um período desafiante para o desenvolvimento das suas práticas educativas. Apesar de valorizarem métodos ativos de ensino, tais como a Metodologia de Trabalho de Projeto, a pressão sentida nesta fase leva a que os professores em início de carreira experienciem dificuldades de natureza diversa na sua implementação. Este estudo visa conhecer a forma como os professores do 1.º Ciclo do Ensino Básico, em início de carreira, integram a Metodologia de Trabalho de Projeto nas suas práticas educativas. Os dados foram recolhidos através de entrevistas semiestruturadas e da análise documental ao espólio de oito professores. Os resultados demonstram que os professores valorizam e procuram contemplar o Trabalho de Projeto nas suas práticas educativas. As dificuldades sentidas poderiam ser atenuadas através de uma abordagem metodológica mais consistente na formação inicial de professores e de uma análise das prioridades educativas nas escolas onde lecionam, que sobrecarrega os professores iniciantes com demasiadas tarefas paralelas ao serviço docente.

Palavras-chave: metodologia de trabalho de projeto, práticas educativas, indução, professores de educação básica.

TRABAJO DE PROYECTO EN LAS PRÁCTICAS EDUCATIVAS DE PROFESORES PRINCIPIANTES

RESUMEN: El comienzo de la carrera profesional de un profesor es un reto para el desarrollo de su práctica educativa. A pesar de valorar métodos de enseñanza activa, como la Metodología de Trabajo por Proyectos, la presión que sienten en esta etapa hace que los profesores a comienzos de su carrera tengan dificultades distintas en su implementación. Este estudio tiene como objetivo conocer cómo los profesores de primaria, al comienzo de su carrera, integran la Metodología del Trabajo por Proyectos en sus prácticas educativas. Los datos se recolectaron mediante entrevistas semiestructuradas y análisis documental del patrimonio de ocho profesores. Los resultados demuestran que los profesores valoran y buscan incluir el Trabajo por Proyectos en sus prácticas educativas. Las dificultades sentidas podrían paliarse mediante un enfoque metodológico más consistente en la formación del profesorado y un análisis de las prioridades educativas en sus escuelas, donde se sobrecarga a los profesores principiantes con demasiadas tareas secundarias al servicio docente.

Palabras clave: metodología de trabajo por proyectos, prácticas educativas, inducción, profesores de primaria.

INTRODUCTION

Throughout their professional career, teachers go through a process of continuous personal and professional growth that is not only based on learning knowledge and skills related to teaching practice (Menezes & Ponte, 2006) acquired in Initial Teacher Education (ITE). Ball and Cohen (1999) argue that teachers should learn from their practices, reflecting on the different situations arising from the process and learning to use their professional knowledge to improve their educational practices. In

this sense, professional development is a constant and continuous process that contributes to the improvement of practices through formal and informal experiences, with the main objective of bringing about educational changes for the benefit of students and the school community (Oliveira-Formosinho, 2009). However, despite the relevance of this topic, there are still few studies focusing on teachers at the beginning of their careers, as mentioned by Príncepe and André (2019) in their review of the literature on teacher education.

In the evolution of teaching in the 1st Cycle of Elementary School (1st CES) in Portugal (1st to 4th year), the central core of the body of content has remained stable in recent years but the same cannot be said regarding the evolution of pedagogical theories and teaching processes (Leite, 2018) that try to keep up with the demands of the 21st century. In this way, the professional performance of the teacher who teaches at the 1st CES involves the development of professional skills related, among others, to the ability to make the content full of meaning, interconnecting it with the various areas of knowledge.

Project-based Learning (PjBL) is one of the active teaching methodologies that allows the interconnection of knowledge and content from various curricular areas. However, despite valuing active and collaborative learning methods, many teachers find it difficult to implement this type of work with their students, due to the characteristics of the group and classroom management (Diesel & Matos, 2019). In terms of research carried out, Choi et al. (2019) refer to the existence of some studies that focus on how PjBL can be applied by future teachers during ITE, but they do not investigate how teachers experience this methodology in their educational practices.

According to Niemi (2011), it is necessary to promote active learning experiences during ITE, with a direct correlation between these experiences and a teacher's professional skills. To better prepare teachers for professional life, Leite and Arez (2011) defend the inclusion of PjBL practices in ITE, allowing future teachers to acquire intervention and curricular integration skills. Galvão and Reis (2002) reinforce the importance of supervision in the Supervised Teaching Practice stages, so that future teachers apply the methodologies covered during ITE, instead of reproducing the models they experienced during their education. Despite the importance of ITE for the development of professional skills, Gatti and Nunes (2009) also recognize its most pressing problems, such as the fragmentation of knowledge and the weak articulation between theory and practice, which make it difficult to resolve issues related to teaching practice.

Before this investigation, a study was carried out with the higher education institutions in which the participants carried out their ITE (Tempera & Tinoca, 2020). To understand the nature of the PjBL approach in the ITE curricula of higher education institutions, the results revealed that institutions try to integrate PjBL throughout their courses in theoretical, didactic, or experiential terms as a working method of certain Curricular Units. However, they find it difficult to promote more meaningful PjBL experiences, which would allow students to feel more confident in using this methodology in the Supervised Teaching Practice internships.

This study aims to understand how 1st CES teachers, at the beginning of their careers, integrate PjBL into their educational practices, seeking to answer questions such as: "What level of preparation do 1st CES teachers feel, at the beginning of the career, to develop projects with students?"; "What importance do they give to PjBL for student learning?"; "How do they use PjBL in the educational practices?"; "What aspects make it difficult to apply PjBL with students?"

Project-Based Learning

PjBL can be considered as a group methodology that presupposes the involvement of all participants aimed at solving problems encountered and of common interest to students, in which they learn in the process of searching for solutions through questions, brainstorming ideas, establishing a plan, research, and communicating with others (Choi et al., 2019; Leite et al., 1989; Vasconcelos et al., 2012). The entire process allows the development of essential skills for today's society, such as the spirit of initiative and creativity, social learning, group work, and decision-making.

Despite not being a recent methodology, Silva (2011) reinforces the idea that PjBL, as an active learning methodology, remains effective and significant, and it is necessary to reinforce the focus on working on projects in preschool and basic education. Taking as a starting point a problem arising from children's experiences, close to their reality and experiences, work of this nature allows the contribution and articulation of different curricular areas, incorporating diverse sources, concepts, and paths in the search for solutions to a problem (Hayes, 2010). Studies such as Tamim and Grant (2013) show that teachers believe that using PjBL in their educational practices helps students acquire diverse skills, such as critical and reflective thinking, time management, and cooperation.

Thomas (2000) defines five criteria for working on projects in the classroom. For this author, projects must be central to the curriculum and not peripheral, focusing on issues or problems linked to the reality that led students to find content in the areas of knowledge involved, involve students in constructive research, and motivate students to work. In methodological terms, Vasconcelos et al. (2012) propose four sequential phases for students to follow when working on projects: (i) *the problem definition phase*, in which the problem is formulated and the question to be investigated is defined; (ii) *the planning and work development phase*, in which the possible path of project development is predicted, through the creation of tables or conceptual maps that allow understanding the direction of the work, considering the defined objectives; (iii) *the execution phase*, in which the research process and activities that enrich and lead to the answer to the defined problem are developed; and (iv) *the dissemination and evaluation phase*, in which learning is demonstrated through the systematization of the work developed, the evaluation of the entire process and the consequent raising of new issues that may give rise to a new project.

The use of PjBL by teachers can have different objectives, depending on their beliefs about how students learn (Tamim & Grant, 2013). For these authors, some teachers use PjBL to teach content, others to extend or deepen it, depending on the students' needs. In this sense, Silva (2005) suggests that PjBL can be developed according to different curricular models, always bearing in mind the focus on student-centered learning. Teachers can develop PjBL according to (i) *directive models*, in which the project is thematic, defined, and guided by the teacher, with students involved in the planned tasks and the discoveries made; (ii) *child-centered models*, in which the project is experiential, based on the interests and needs of students and being progressively developed and supported by the teacher; and (iii) *constructivist models*, in which the project is negotiated between the teacher and the student from the formulation of the problem to planning, execution and evaluation.

In the positive aspects of applying PjBL in the classroom, Bell (2010) considers that the skills that students develop through PjBL help them become productive members of society. These skills cannot be measured through standardized tests or exams, which is why the author suggests a change in focus and thinking about the assessment. Learner-centered methodologies, such as PjBL, should be used

for students to develop fundamental skills needed for 21st-century challenges, including collaboration, creativity, critical thinking, and communication.

For Efstratia (2014), teachers' discouragement from implementing PjBL in their educational practices is related to their lack of experience, lack of motivation, or the feeling that it constitutes an additional activity among many, that they feel obliged to develop. In addition to these aspects, the duration or longevity of a project can also be a factor that limits its application. Revelle (2019) refers to several studies that explore teachers' perceptions of obstacles in implementing PjBL, identifying: (i) the time needed to prepare and develop projects; (ii) the change in defined roles in the classroom (from a more directive to a more student-centered way); (iii) classroom management; (iv) concern about not complying with the curriculum by spending too much time on projects; and (v) the difficulty in supporting students' diverse learning.

On the other hand, according to Kwietniewski (2017), the issue of pedagogical differentiation should be a factor that enhances and does not limit the use of this methodology in the classroom, as it narrows the differences between students with higher or lower performance, to the extent that these interact and learn from each other. Despite the long duration between planning, implementation, and completion of a project, PjBL allows teachers to establish connections between content and achieve more than one objective at a time, establishing bases for the different rates of student development. The author also states that the biggest obstacle to the implementation of PjBL is the teachers who feel that they are not prepared and that they need more training.

Tamim and Grant (2013) add other challenges to the implementation of PjBL that teachers need to take into consideration when using this methodology in their practices. For these authors, teachers need to: (i) be open to constructivist approaches; (ii) develop student-centered teaching skills; (iii) have the motivation and ability to adapt their teaching strategies; and (iv) develop self-confidence to manage the activities arising from PjBL. Believing in the effectiveness of PjBL as a constructivist model of student-centered learning is essential for teachers to feel capable of overcoming the challenges of its implementation.

Recent studies demonstrated the potential of the application of PjBL for student learning and the effectiveness of the teaching-learning process promoted by teachers. Choi et al. (2019) establish a positive correlation between PjBL and student involvement in the activities carried out, as it allows them to get involved in the search for solutions to the problems raised, in the debate of ideas, in planning, and communication between peers. Virtue and Hinnant-Crawford (2019) conclude that students value working through projects, as they can establish a parallel between the results of their work and the real world, being able to understand how concepts are applied in practice. Revelle (2019) finds that teachers develop a different vision of the curriculum and an improved perception of the feasibility of implementing this methodology. A study developed by Chen and Yang (2019), which involved a quantitative meta-analysis of 20 years of research produced on this topic, reveals that this methodology has a medium-high positive effect, compared to transmissive teaching methods, suggesting that PjBL is an alternative or complement to this type of methods.

Induction into the teaching career

Induction into the teaching career is entered into the profession in which the transition from students to teachers is established (Marcelo & Vaillant, 2017). While some authors consider the first year

of service as the teacher's induction phase (Tickle, 2000), others extend this period to 3-5 years (Flores, 2000; Marcelo, 1991). Príncepe and André (2019) disagree with this period, stating that, until the teacher reaches professional stability, he or she will continue to experience situations of exploration, the "fight for survival" and adaptation to new contexts, characteristics of the induction phase. Making an analogy between childhood and the induction phase, insofar as the quality of what one experiences in the first years determines one's development into adulthood, the authors reinforce that the induction phase must consider the conditions of teachers' work and should not be limited to a fixed period.

Considering the first years of the profession as extremely demanding, Harju and Niemi (2016) state that although IT provides the basis for a teacher's work, it does not sufficiently prepare teachers at the beginning of their careers for professional life. Cruz (2017) notes that there is a lack of practical references in IT, given that it focuses more on the fundamentals of teaching action than on the methodologies that favor its development.

As the induction phase is a period of tension and great learning in unfamiliar contexts, Marcelo (2009) refers to the challenge for teachers in acquiring professional knowledge and personal balance. Being a period marked by challenges, discoveries, adaptation, and transition, the author considers that new teachers have the difficult task of combining factors such as getting to know the group of students, creating a learning community in the classroom, acquiring knowledge about the curriculum and the school, plan their intervention strategies and continue to develop a professional identity. However, despite the intensity experienced in the first years of their career, Harju and Niemi (2016) consider that this factor does not mean that new teachers are not capable or competent in their work.

The OECD (2011) suggests that schools offer well-structured induction programs to new teachers and that they reduce the weight given to seniority to balance the type of work and not overload early-career teachers with overly demanding tasks. It also recommends that ITE provide postgraduate programs that prepare teachers to fit into diverse types of schools and years, increasing opportunities to be placed in different schools. To this end, higher education institutions must maintain close links with schools and the profession to respond to the needs of teachers as they enter the job market. In addition, Marcelo and Vaillant (2017) point out the benefits that induction programs can have for teachers, needing to be further supported and developed by schools and principals, given that informal induction is not enough.

Since future teachers begin to develop their professional identity in ITE (Sutherland et al., 2010), in the induction phase, the greatest transformations occur influenced by the experiences arising during their career integration (Flores & Day, 2006). In this sense, this phase of professional development constitutes a fundamental moment for the use of active methodologies, such as PjBL, given that, at this stage, teachers model their understanding of teaching processes and rebuild their professional identity, establishing practices that they will use throughout their future professional career.

METHODOLOGY

This study is located within a phenomenological-interpretive paradigm (Cohen et al., 2018) seeking to understand the subjectivity of human experience and, at the same time, maintain the integrity of the phenomenon investigated and interpret it from the participant's point of view. In this way, the inferences made emerge from the situations observed. The objective of this investigation is to understand the phenomena observed at the specific time and place of data collection and compare them with what

is observed at different times and places. There is, therefore, a concern to understand and interpret the observed situations considering those involved. By studying the processes and dynamics of teaching practices of teachers at the beginning of their careers, we aim to provide a better understanding of the situations observed, helping to formulate working hypotheses about them.

The participants in this study are eight teachers from the 1st CES, in the career induction phase, having two to five years of professional experience at this level of education, who use PjBL in their educational practices. The teachers were selected through recommendations from the coordinators of the ITE courses they attended, belonging to two higher education institutions with similar training models, but with different curricula. Both institutions consider PjBL as a methodology inherent to their courses. The teacher selection criteria considered the years of teaching service (between two and five) and the fact that they had used PjBL in their educational practices in the 1st CES.

For this study, two sources of data were used to ensure methodological triangulation, using two methods for the same object of study (Cohen et al., 2018). Semi-structured interviews were carried out with each of the participants, to understand their perspectives on the use of PjBL in teaching practices. The interviews were based on a previously defined guide, with the guarantee that participants would answer the same questions (Bogdan & Biklen, 2013), while at the same time seeking to maintain a degree of freedom in their exploration. Documentary analysis was also carried out on the teacher's estate containing work plans and student productions, to corroborate and reinforce the understanding of how PjBL is developed and implemented in the context of teachers' educational practices. The documents provide us with different information about an event that involves the participants (Tuckman, 2002), corroborating and clarifying what was mentioned in the interviews. Considering that the entire research process must respect the principles of research ethics, the principle of informed consent was followed (Tuckman, 2002), in which all participants were informed of the nature and objective of the study, and the anonymous nature and voluntary participation. Throughout the process, maximum respect was given to all participants, as well as their perspectives and views on the topics covered. The protection of the participants' identity was respected, as their anonymity was guaranteed, with the names of the institutions and professors involved in the investigation not being mentioned. They were also asked for permission to publish excerpts from the interviews and images of the documents provided. Due to the pandemic situation and mandatory confinement of the country during the study, all interviews were carried out online, via videoconferencing platforms, and all documents were digitized and sent by email, and there was no opportunity to analyze the originals.

Subsequently, the data collected was subject to content analysis (Amado, 2017) and categorized according to the regularities observed and common aspects identified, following the objectives of the study. The names of the teachers presented in this study are fictitious, maintaining the anonymity of the participants and the confidentiality of the data.

RESULTS

Through the interviews carried out, 12 topics emerged showing how 1ˢᵗ CES teachers at the beginning of their careers view and integrate PjBL into their educational practices. These topics are related to the research questions, which will be the focus of the presentation and discussion of the results obtained.

Research Question 1: What is the level of preparation felt by 1ˢᵗ CES teachers, at the beginning of their careers, to develop projects with students?

All teachers in this study had contact with PjBL during their ITE, either in experiential terms, as a methodology adopted by some Curricular Units of the course, or in theoretical and didactic terms. Seeking to know their perception of the preparation provided by the courses for PjBL with students, two topics emerged. Teachers recognize that preparation for this type of methodology was insufficient but also that the possibility of applying PjBL in Supervised Teaching Practice stages was decisive for their preparation.

Topic 1: Insufficient ITE approach.

Seven of the eight teachers consider that they did not feel fully prepared to develop projects with their students, after completing the ITE course. The reasons given relate to the lack of practical experience during the course, the lack of connection between theory and practice, the lack of depth of the approach in the course, and the impossibility of applying this methodology in practice, in the context of internships, due to the circumstances of the context or the methodologies adopted by the class teacher at the host school (called Cooperating Supervisor).

The lack of practical experience during the course was mentioned by teachers as a reason for lack of preparation. The theoretical approach was not considered sufficient, so some participants would have liked to have experienced this methodology in some Curricular Units of the course, such as Hélia who states that "at [name of the institution where she took the ITE] effectively, we never did work like that, with this methodology." Elisa refers to her experience in higher education as not very rich in methodological terms. In her opinion:

> Sometimes in training, there is a bit of fear of embarking on or introducing students to these methodologies that displace us... There is a certain fear of putting us into these new methodologies... Because, you can imagine, if I were a higher education teacher and if I don't believe, maybe I won't present much to my students.

Some participants talk about the little connection between theory and practice, as they feel that some teachers do not have a direct connection with practice in Basic Education schools, and present theory as disconnected from reality. Diana explains that "the theory is often nothing like that. At [name of the institution where he completed his ITE] they can tell us worlds and depths but when we get to the field, sometimes it's not possible to do anything like that... a lot of other things happen at a school".

The lack of depth in the approach to this methodology was another reason cited by the participants. Some of them reported that PjBL was approached superficially, together with other methodologies, without having enough time to internalize it. Ivo reported "During the degree, we talked a little, very lightly. In master's degrees, we talked more. But the ITE was insufficient." Hélia shared the same opinion, saying that ITE gave her a foundation, but did not adequately prepare her for the type of work she faced when she entered her career.

Despite the aspects mentioned, most participants admit the importance of ITE for their professional preparation. Glória says: "I think that only after we are in practice, on the field, can we improve. But everything we learned was rich... what we learned in theory and then seeing it work in practice was an added value." In fact, to fill some gaps identified in their training and to feel more

prepared, some teachers suggest that ITE should promote: (i) moments of practice, according to this methodology, in Curricular Units from different areas of knowledge; (ii) offer the possibility of applying this methodology in Supervised Teaching Practice internships; and (iii) promote more contact with the school reality by inviting teachers from the 1st CES to talk about their experiences in the field.

Only Filipa considered that she felt confident in applying PjBL with students, after the ITE course, stating: "I felt completely prepared… This is because all the internships I had were very rich, excellent experiences… I consider that my training was quite significant with this methodology." Filipa therefore recognizes the importance and contribution of Supervised Teaching Practice internships for this purpose, which leads us to the second topic of analysis.

Topic 2: Supervised Teaching Practice Internships

The five teachers who had the opportunity to apply this methodology in the Supervised Teaching Practice internships refer to it as fundamental for their didactic preparation. Hélia recognizes that she learned a lot from her internships: "I was lucky enough to do an internship at two very good places... They introduced us to the pedagogical Saturdays of the Modern School Movement, where they talk a lot about PjBL". Glória admits that "obviously I still have a lot to learn, being my first year as a full professor, but [the internship experience] helped me a lot in being able to apply this methodology". Filipa reinforces that:

> We had experiences that triggered in us these practices that favor PjBL, autonomy-based work, and cooperative work, all these methodologies that meet significant learning and that allow us to have a practice that is much more directed and centered on students than exactly in us.

However, not all participants had the opportunity to apply PjBL during internships, being limited to following the methodologies used by the Cooperating Supervisor. Carla states that she learned about this methodology at IT, but "in the internships I did, it was not the methodology applied in the classes… As I didn't do it during the internship, [when I started my career] I didn't have much experience". In her internships, Bruna says: "It was the method that the Cooperating Supervisor followed, everything very standardized, after page 12 comes page 13... the traditional one".

Research Question 2: What importance do 1st CES teachers at the beginning of their careers give to PjBL for student learning?

All teachers highlight the importance and relevance of PjBL in student learning, even though it is not the only methodology they use in their educational practices. When asked what learning through projects meant in their opinion, most teachers referred to its advantages and importance. Following their responses, three topics of analysis emerged.

Topic 3: Engagement and motivation to learn.

Six teachers mentioned placing students at the center of learning as a strategy that boosts involvement, motivation, and predisposition to learn. Carla thinks that PjBL "is one of the methodologies that I have already used and observed, the one that involves children the most. Since children are more involved, they also learn better." From her own experience, Filipa reports that "[students] are always very motivated to work on projects, because the topic comes from themselves, from their curiosity and then they already are motivated. Their predisposition to learn is completely

different." The curiosity demonstrated by the topics to be developed is an essential aspect also for Ivo, as he considers that, for students, "questioning reality, not being resigned, and trying to understand what is happening around them at school, in society, in the family…. It stimulates the desire to know."

Topic 4: Development of social skills.

For five teachers, one of the most important aspects of integrating PjBL into their educational practices is the development of social skills, transversal to the entire curriculum such as cooperation, autonomy, and communication.

As group work, cooperation, and collaboration are a fundamental strategy in project development, teachers assume that these skills must be developed by 1ˢᵗ CES students. At an initial stage, age, and inexperience in this type of work can be perceived as an obstacle to carrying out projects but its continuity reveals significant results. Regarding her 1ˢᵗ grade class, Glória says that "they still don't know how to work as a team, in partnership, in cooperation and these are skills that, as a teacher, I aim for them to develop… PjBL allows this." Hélia reinforces this idea:

> At these ages [students] are still very focused on themselves and their ideas and have difficulty accepting the opinions of others, I think that PjBL has this great advantage of making them work in groups for common success, so they are all immersed in that to have a final product that they built, therefore, they had to organize themselves.

The responsibility that students assume for the project they develop allows them to organize more effectively and make decisions more autonomously. Filipa reports that:

> At the beginning of the year, it was noisy, discussions were going on all the time within each of the groups, but in the middle of the year or almost at the end, we had much more harmonious moments in the classroom, much more autonomous, in which my intervention needed was little, in which I limited myself to going from group to group, taking a look, and I didn't need to intervene as much.

In addition to the need to communicate between members of the group to which they belong, expressing their ideas and listening to those of their colleagues, the moment of sharing productions leads students to develop communication skills. Filipa admits that, when she started implementing the methodology in her class, "she had a lot of difficulty convincing a child to present to a large group. But they also develop these capabilities and I think that, in this sense, it is very important to develop projects". For the development of this skill, Glória highlights the final phase of dissemination and evaluation of projects as being extremely important in the sense that she observes students "gaining confidence to present, show how they did it, and then listen to others who also have a critical sense, give constructive suggestions… This exchange of ideas and opinions I think is important, fundamental in this process".

Topic 5: Interdisciplinary approach.

As an advantage of PjBL, six teachers mentioned interdisciplinarity and articulation between curricular areas since they allow the creation of a thread through a topic, giving meaning to students' learning. In Bruna's experience, the use of this methodology allows even students with more difficulties of different types to be able to understand the application of more abstract content, by establishing connections between them and the project topic. Elisa also considers that PjBL allows students to make

a comprehensive, relational, and meaningful reading of reality, by relating content from various areas of knowledge. Although interdisciplinary curriculum management is not a simple process to implement, it is highly valued. Reinforcing these ideas, Filipa recognizes that students "can have relational knowledge, in the sense that they can integrate several [curricular areas] in the search for their knowledge".

Research Question 3: How do 1st CES teachers at the beginning of their careers use PjBL in their educational practices?

The reasons why teachers decide to use this methodology are essentially related to the advantages they recognize, and the teaching principles adopted by the school. Teachers ensure specific moments in the weekly agenda to carry out projects and adopt different ways of applying PjBL, which is why four topics of analysis related to this research question emerged.

Topic 6: Topics proposed by teachers.

Through the testimonies of six teachers, an approach to PjBL was identified following the *directive model* (Silva, 2005), in which student projects can come from a common theme defined by the school or from topics related to the curriculum, previously selected by teachers.

The School Project of each institution is generally subordinated to a theme defined annually. The global theme is usually subdivided into themes adopted by each of the institution's years of school. However, for the topic of her class, Carla tries to be chosen by the students so that something is not imposed on them that they are not interested in working on throughout the school year.

Other practices detected correspond to the prior selection of topics related to the curriculum, which students choose to work on, depending on their interests. In her class, Hélia tries to offer several options for curriculum topics, so that students have several options to choose from and can be in groups according to their interests.

Topic 7: Themes proposed by students.

Another PjBL approach, identified by three teachers, was the free or negotiated selection of themes that arise in the group of students, through questions, discussions, or expressed curiosities, following the child-centered model or the *constructivist model* (Silva, 2005).

Having recently introduced this methodology in her class, Elisa tries not to interfere with the student's choices, accepting the proposed themes and guiding their research. Glória agrees, and gives students freedom of choice, even if the topics are not directly related to the curriculum, as she intends "for them to gain a taste for this methodology and become interested in working". It is important to emphasize that the teachers who use this project work model are those who were responsible for 1st-grade classes or who were introducing the methodology in their classes.

There are contradictory opinions regarding the two approaches adopted by different teachers. Hélia does not agree with letting students freely choose topics, as they can be very diverse and have little content for a Project. In her opinion, "Sometimes it makes more sense to be a little more guided, especially with kids who are so young… They have no idea what they can research." Ivo, on the other hand, seeks to adopt both models, proposing curriculum themes selected by himself and themes of interest to students, as "we know that the [curriculum] is extensive, but I think that just making projects based on the content is very reductive, because we are almost cutting off the students' initiative. I think there must be a duality there."

Topic 8: PjBL Phases.

Regardless of the models adopted in developing projects with students, teachers know and seek to follow phases like those defined by Vasconcelos et al. (2012).

The *problem definition phase* depends on the approach used, as the topic can be selected by the teacher or the students. In both cases, it is essential for all teachers that students identify with or are curious about the topic or problem.

The *planning and development phase of the project* is followed by all teachers, as they seek for students to define what they want to know about the topic and think about how they will achieve that knowledge. It is a phase of sharing ideas that, from Glória's perspective, becomes difficult to manage, as all students want to express their ideas and have them followed by the group.

In the *execution phase*, teachers stated that they seek to address or interconnect content from various curricular areas or, in Bruna's case, keep the topic transversal to the teaching activity: "Even when we were not directly working on the project, whenever it was possible to articulate whatever we were working on with the project, [the topic] was present."

The *dissemination and evaluation phase* is very diverse, depending on the type of student production. Teachers consider sharing productions an important and enhancing stage in the development of skills. Even when it was not possible to complete this phase due to the time set by the institution for carrying out projects, Filipa tried to ensure that students had this opportunity during the morning moments of the general presentation of productions. The evaluation component was not explicitly mentioned by the teachers, although after the end of a Project, most participants allowed each other to comment on the projects presented. From Glória's perspective, this is a fundamental stage for sharing ideas, and suggestions and developing critical thinking.

Through documentary analysis carried out on the ideas or project planning tables, corresponding to the second phase of PjBL, and the students' final products, corresponding to the final phase of PjBL, it was possible to verify that participants seek to follow the fundamentals of methodology, even if they are unable to implement it in full. Some final products had the help of an adult, family, or teacher, due to the improvement shown in certain productions, which is not characteristic of these ages. This aspect is not considered as something negative for Carla, stating that "the students were much more motivated, the results were more positive, and even the parents got involved in a different way than they did in the first class where I did not use this type of methodology". In the case of a Project that competed in a regional competition, Andreia points out that "[student's name]'s father composed the music and the lyrics together. The puppets were made by the students, but everyone together decided what to do." Bruna also highlights that PjBL contributes to parental involvement, which is desirable and strengthens links between the school and the family.

Topic 9: Surface planning.

There is prior preparation for selecting topics to propose to students by teachers who follow this model, but five participants stated that they do not prepare moments of intervention in PjBL in the same way as they prepare other moments.

The selection of topics is, in some cases, the result of meetings between teachers from the same year of school at the institution and results in a proposal for students to choose from. In Bruna's case, the teachers even met at the end of the day to prepare the next steps, trying for the project to evolve in a certain direction: "We prepared ideas, debated, even though we had different classes. Sometimes we

cheated. The project was trending to the left and, without letting [the students] know, we tried to keep it from getting too far out of our control."

In cases where students are responsible for choosing the topics to work on, teachers stated that there is no specific preparation for the work to be developed, other than research on subjects that they do not fully understand. For Ivo, "the intervention cannot be prepared very well because [the students] are [at] different stages with different themes... So, at home, or even at school, I was researching to help them, but it wasn't like that at all. very intentional." Filipa reported a similar situation, "When I was asked something, I would quickly research... And when I couldn't find or found an ambiguity in the answers, I would postpone the answer and go home, with more time... This way I would answer in a close and suitable way for students".

Research Question 4: What aspects make it difficult to apply PjBL with students?

The aspects mentioned by teachers as limiting or making PjBL difficult are related to group management, the articulation between areas of knowledge, and the demands of teaching work, constituting the three topics of analysis related to this issue.

Topic 10: Student group management.

From the perspective of five teachers, group management is a factor that makes project development difficult, considering the diversity of topics that are worked on at the same time. Simultaneous support for all groups is, for Glória, a difficulty, especially if the students are from lower years of school or if they do not yet have sufficient autonomy and group work methods. Hélia felt the same concern, especially at the beginning of the project execution phase, when students needed more guidance. In addition to this difficulty, Ivo highlighted the different work rhythms, which means that some groups may be at different stages of the projects, requiring support of a different nature.

Despite this difficulty, none of the teachers considered abandoning this methodology, being aware that it is a work in progress and that students' difficulties tend to ease with the development of skills and work habits. Some teachers try to take advantage of the presence of support teachers to help students at times when group support becomes more complicated. Filipa found a partial solution to this difficulty in organizing groups by creating general scripts for projects and assigning roles to be played by students so that they became more autonomous:

> You need to have something very well structured, I created very general scripts, not for each theme, but general ones, and I often distributed cards with roles to each [group member]. For example, in the groups, one was the one who raised his hand, another was the one who managed the conflicts, another was the mediator, another was the presenter... Every week, the cards rotated. And I didn't insist on controlling this, I left it up to them, I handed over the cards and they distributed them.

When experiencing the same type of difficulty, Glória also found an effective strategy by using Autonomous Study Time to support some groups in projects:

> During Autonomous Study Time I can divide the class, I have students who are working on Autonomous Study, and I have students who are doing projects. This way I can help those who

are working on projects, and we switch, as if they were stations. It's a way of helping everyone since I'm just one.

Topic 11: Articulation between curricular areas.

Teachers consider that different curricular areas can compete for the same project, making it interdisciplinary and full of meaning. Despite being a desirable aspect of project development, Andreia considers that it is not easy to try to integrate activities from different areas of knowledge in the same project. Carla also feels that curricular integration and the creation of a common thread across areas of knowledge becomes a difficult task, mainly due to the diversity of topics that students do not fully master. From her experience, she reported that she often had help from a more experienced colleague from the school, who had been used to working with this methodology for several years and who helped her understand how she should start and where she should focus so that the work started to flow.

Topic 12: School policy.

The length of the curriculum and institutional requirements are factors that, from the perspective of four teachers, also influence the development of projects. Filipa talks about the broad agenda of activities created by the school, which requires time and dedication, taking away some useful time for other activities planned by the teacher. Andreia confesses that the excess of reports, involving bureaucracy and control by the School Management limits her time to plan activities of a different nature within the scope of projects. Bruna's speech showed her displeasure with general educational policies, as they limit curricular management and pedagogical differentiation, due to all the inherent demands:

> Teaching, I feel, is like filling students with content... We can't keep filling them with things to learn. Not even forcing them to do the same thing at the same time and the same exams. Where is the flexibility, adaptation to the class, and individualized work, when you get to the test and everything is the same for everyone, even though you know that some will not be able to take it? It is impossible to do PjBL if we have a template to apply to all classes and all students. We need to have the courage to say, "This shouldn't be like this".

DISCUSSION

The scheme presented in Figure 1 systematizes the relationships between topics demonstrating how 1st CES teachers at the beginning of their careers view and integrate PjBL into their educational practices.
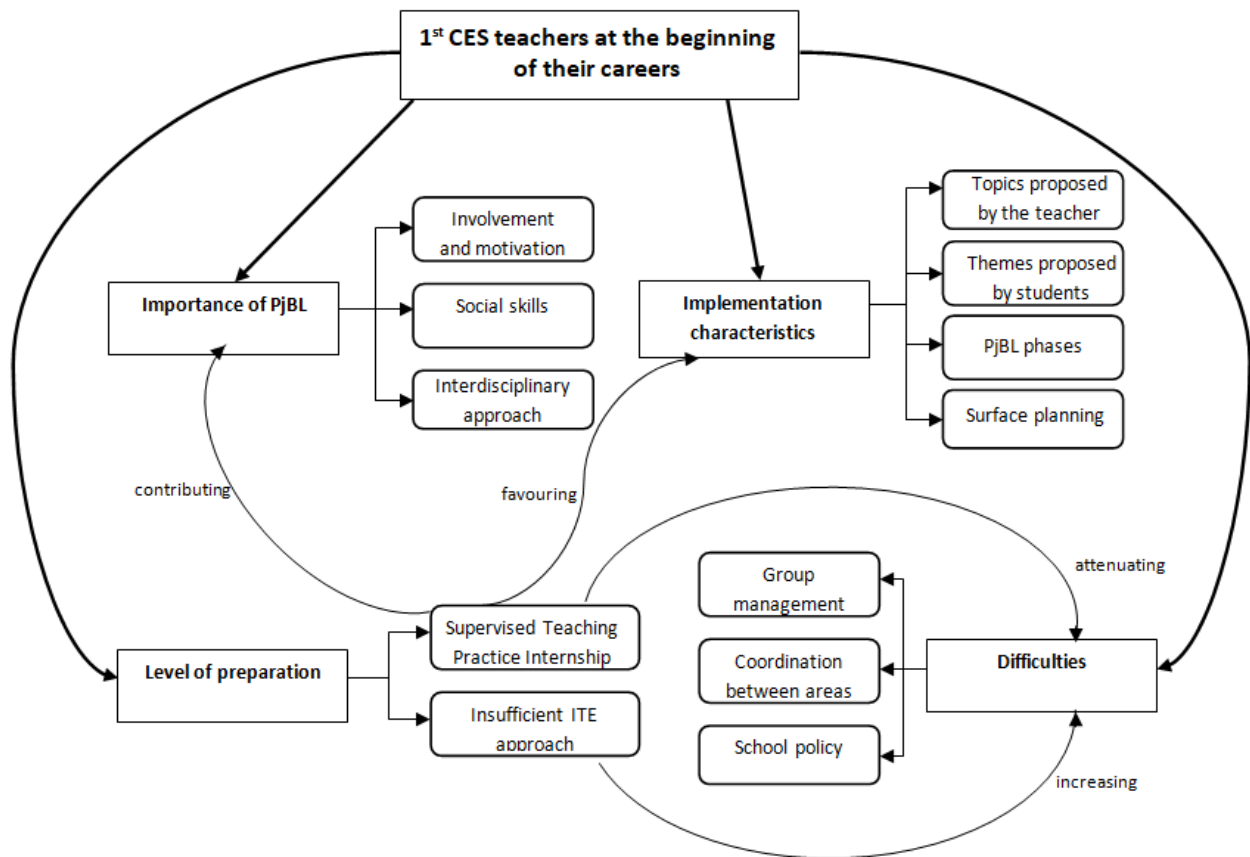
Figure 1 - PjBL in the educational practices of 1ˢᵗ CES teachers at the beginning of their careers.

During their ITE, teachers had contact with the methodology at a theoretical, didactic, and experiential level, as suggested by Leite and Arez (2011), although it seems not to have been enough to feel prepared to develop this methodology in their educational practices. This fact may be associated with the fragmented structure of the course curriculum and insufficient articulation between theory and practice, as suggested by Gatti and Nunes (2009). Despite providing them with the necessary skills for practice, ITE does not seem to adequately prepare them for the application of more demanding methodologies in the first years of their teaching career (Harju & Niemi, 2016). The insufficient approach in ITE increases difficulties in the application of PjBL by teachers, which are mitigated by experiences in Supervised Teaching Practice internships, which contribute to an appreciation of the methodology and favor the development of skills in its application. There is a need to continue investing in the inclusion of active teaching methods in teachers' ITE, given that their school career is marked by a mostly transmissive type of teaching. Many have their first experience with active teaching methodologies, such as PjBL, only in higher education, making it necessary to rethink or reinforce the approach to these methodologies in courses. For teachers, Supervised Teaching Practice internships seem to be privileged moments for the application of active teaching methodologies, as recognized by Galvão and Reis (2002). However, due to the school contexts in which future teachers are integrated, this approach is often not possible and not everyone can benefit from this experience. A closer connection between Higher

Education institutions and cooperating schools will be necessary, as well as an offer of continuous training to Cooperating Supervisor, so that they work together, with the common objective of improving the quality of 1ST CES teaching.

The importance that early career teachers attribute to PjBL in student learning is related to the advantages they recognize: (i) involvement and motivation to learn, due to the focus on topics or problems of interest to them (Revelle, 2019; Thomas, 2000); (ii) the development of social skills that cross the curriculum, such as cooperation, communication, critical thinking and creativity, essential characteristics for the challenges of this century (Bell, 2010; Tamim & Grant, 2013); and (iii) interdisciplinarity, with articulation between areas of knowledge, integrating knowledge of a diverse nature in each project (Hayes, 2010). Despite having different experiences, teachers reveal similar conceptions about PjBL and are aware of its advantages in student learning.

Three different models of PjBL were identified in the approach of this methodology by teachers, as defined by Silva (2005). The *directive model*, in which the teacher selects the topics to work on, was identified in the practices of teachers with higher year groups; the *child-centered model*, in which the teacher gives complete freedom in choosing the topics to work on, was identified in the practices of teachers with early years classes; and the *constructivist model*, in which the topic is negotiated between students and the teacher, was identified in the practices of teachers with classes in which PjBL was already implemented or had been implemented for some time. We can hypothesize that the curricula of higher grades, being more demanding in terms of content, lead teachers to direct students towards certain topics to ensure that these are covered during the work; and that first-year teachers give students more freedom regarding topics, as they aim to develop social skills and PjBL habits. In any of the approaches adopted, teachers consider it necessary for students to be interested or motivated by the topics, which is why they give them a degree of freedom to choose.

Regardless of the models adopted, teachers approach the PjBL phases defined by Vasconcelos et al. (2012), even though there are changes resulting from the work. The initial discussion of the themes to be developed and the students' initial conceptions, the planning of the work to be carried out, research, the presentation of productions, and hetero-evaluation are valued. Due to the diversity of topics under development, teachers do not consider significant preparation for these moments essential, other than independent research. It will be important to raise awareness of the fact that PjBL is a methodology that also requires preparation by teachers, particularly in terms of developing activities related to themes that provide students with tools to unblock certain difficulties and advance autonomously in solving problems during projects. The design of prior planning gives added relevance to the work carried out by students, from an interdisciplinary curricular management perspective, ensuring that projects are not seen as an additional activity, but rather an integral one. The provision of ongoing training related to active teaching methodologies or the creation of discussion groups among the school's teachers could be solutions to this awareness. In any case, it would be necessary to recognize that each teacher may use PjBL for different purposes, to address content or to reinforce or extend it, as highlighted by Tamim and Grant (2013), so that it is respected their beliefs about this methodology and the individual needs of their students.

Despite the importance given to PjBL, teachers identify difficulties that sometimes limit the development of projects in their classes more effectively. Support for different groups and diverse work and learning rhythms (Diesel & Matos, 2019; Revelle, 2019) are factors that teachers consider as conditioning factors in the fluidity of work. In line with the study carried out by Kwietniewski (2017),

pedagogical differentiation is seen as an advantage, but also as a limitation to the application of this methodology, due to the difficulties of articulation between competing curricular areas for the same project. The third aspect identified is related to school policies, the excess of tasks assigned to the teacher, compliance with the curriculum, and the weight of assessments which, according to (Efstratia, 2014), can lead to the discouragement of teachers from applying PjBL in their classes. It is essential to analyze the educational priorities in each institution, so that teachers at the beginning of their careers, being more inexperienced, can have the freedom to develop their teaching skills without being overloaded and pressured with assigned tasks, which reduces the time and availability to plan and invest in their educational practices.

FINAL CONSIDERATIONS

This study aims to understand how 1st CES teachers, at the beginning of their careers, integrate PjBL into their educational practices.

Through the testimonies collected and the documentary analysis carried out, it was possible to verify that all participants in this study value and care about integrating PjBL into their educational practices. Not being the only methodology adopted in their practices, it is an integral part of their weekly planning, despite the difficulties inherent in its application.

There are some limitations to this study that result, above all, from the pandemic situation that the country was experiencing during the study and its consequent restrictions. In addition to the interviews and document analysis, it was planned to carry out observations of moments of PjBL development by teachers, but the limitations of external elements remaining in the school premises prevented this type of data collection. Observation would have been useful to analyze the way teachers apply the methodology in their classrooms and, mainly, to understand how the project execution phase unfolds, as it is the stage in which there is less data for analysis. Another factor that can be considered as a limitation of the study is the open nature of the interview questions. Although it allows participants to express freely about their experiences, there is little focus on specific issues or situations that we would like to know about.

We found that there is still a way to go in optimizing the approach to active teaching methodologies in ITE programs, as there are still difficulties in integrating these methodologies into teaching practices by teachers at the beginning of their careers. We consider it important to encourage the use of PjBL during the induction phase, given its potential to transform teachers' identities and their professional development for the rest of their careers. Based on the assumption that the induction period is considered crucial for the construction of professional identity (Flores & Day, 2006; Niemi, 2011; Tickle, 2000), being even more decisive than ITE, this phase of professional development is considered a crucial moment for the use of PjBL, given the relevance we recognize for student learning and the intention that it will become a strategy present in the repertoire of practices of new teachers for the rest of their career. Future investigations could focus on teachers' knowledge, seeking to understand what they know, what they should know, and how this knowledge is acquired. Studies of this nature could open perspectives for the training needs of 1st CES teachers, to which Higher Education institutions could answer.

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Author 1 – Author of the research, collection, data analysis and final text.
Author 2 – Research advisor, active participation in data analysis and review of the final text.

DECLARATION OF CONFLICT OF INTEREST

The authors declare that there is no conflict of interest with this article.