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Problematization as a teacher training tool on active methodologies

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ABSTRACT. The present study aimed to identify teachers' understanding of active methodologies before and after a training course, as well as their evaluation and possible use in the school context. The study subjects were 21 teachers from the final years of elementary school in a municipal public school. With this purpose was proposed a training course to discuss the use of active methodologies in the school context. A questionnaire was applied both in the first and last meeting of the course, seeking to verify the teachers' understanding of active methodologies, their use in the school context and the teachers' evaluation of the course. This was organized according to the availability of school hours, and carried out over five meetings, one every consecutive week, and its organization was based on the methodology of problematization with the Arch of Maguerez. At the end of the course has been noticed a broader view on the part of teachers on the understanding of the theme, having them reported that active methodologies are more related to solving students' daily problems, focusing more on the teaching and learning process than on the use of teaching strategies, as seen earlier. As for the evaluation of the course, the teachers believe that it was positive and dynamic, and claimed that the next ones could take off more hours to deepen the discussions. In this sense, it is emphasized the importance of carrying out actions that offer teachers the expansion of knowledge, as well as new learning related to teaching practice.

Keywords: teacher training; elementary school; teaching methodology; Arc of Maguerez.

A problematização como ferramenta de formação de professores sobre metodologias ativas

RESUMO. O presente estudo teve como objetivo identificar a compreensão de professores sobre metodologias ativas antes e após um curso de formação, bem como sua avaliação e possível utilização no contexto escolar. Foram sujeitos do estudo, 21 professores dos anos finais do ensino fundamental de uma escola pública municipal. Para tanto, foi proposto um curso de formação para dialogar sobre o uso de metodologias ativas no contexto escolar. No primeiro e último encontro do curso foi aplicado um questionário para verificar a compreensão dos professores sobre metodologias ativas, a utilização destas no contexto escolar e a avaliação dos professores sobre o curso. Este foi organizado de acordo com a disponibilidade de horário da escola, e realizado ao longo de cinco encontros, um a cada semana consecutiva, e sua organização se deu com base na metodologia da problematização com o arco de Maguerez. Ao final do curso, notou-se uma visão mais ampla por parte dos professores sobre a compreensão da temática, onde os mesmos relatam que as metodologias ativas estão mais relacionadas a solução de problemas do cotidiano do educando, focando mais no processo de ensino e aprendizagem do que na utilização de estratégias de ensino, como visto anteriormente. Quanto a avaliação do curso, os professores acreditam que este foi positivo e dinâmico, e reivindicaram que os próximos pudessem desprender de maior carga horária para aprofundar as discussões. Nesse sentido, ressalta-se a importância da realização de ações que ofereçam aos professores a ampliação de saberes, bem como novos aprendizados relativos à prática docente.

Palavras-chave: formação de professores; ensino fundamental; metodologias ativas; arco de Maguerez.

Problematización como herramienta para la formación del profesorado sobre metodologías activas

RESUMEN. O presente estudio tiene como objetivo identificar a los profesores sobre la metodología activa antes y después de un curso de entrenamiento, así como su evaluación y posible utilización el

contexto escolar. Fueron temas del estudio, 21 profesores de los últimos años de la escuela primaria en una escuela pública municipal. Por lo tanto, se propuso un curso para hablar de la utilización de metodologías activas en el contexto escolar. En la primera y última reunión del curso, se aplicó un cuestionario para comprobar a los profesores sobre la metodología activa, el uso en el contexto escolar y la evaluación de los profesores en o curso. Esto se ha organizado desde el acuerdo con la disponibilidad del horario escolar, dividida en cinco reuniones, una cada semana consecutiva, y su organización se llevó a cabo en base a la metodología de problematizacao con o arco de Señor Maguerez. Al final del curso, se observó una visión más amplia en la parte de los maestros en un tema común, donde se relató que como metodologías activas son más relacionadas con solución de problemas de la vida diaria del estudiante, centrándose más en el proceso de enseñanza y aprendizaje que en el uso de estrategias de enseñanza, como se ve anteriormente. En cuanto a evaluarlo del curso, los maestros creen que esto era positivo y dinámico, y afirmaron que los demás podrían dejar más carga de trabajo para profundizar los debates. En este sentido, destacamos la importancia de realizar acciones que ofrezcan a los maestros la expansión del conocimiento, así como el nuevo aprendizaje derivado de la práctica docente.

Palabras clave: formación del profesorado; escuela primaria; metodología docente; arco de Maguerez.

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Introduction

Some educational discourses have attached great importance to the practice of teachers and the knowledge they produce in the school environment, highlighting them as fundamental elements for the training process of teachers (Vasques & Sarti, 2017). In the educational environment, over time, there have been many transformations in order to improve the teaching and learning process, with active methodologies being a part of these changes, where education is no longer just the transmission of knowledge and starts to work with problematization, providing the student with the formation of critical and reflective thinking. Still, with the technological advance, it is necessary that the teaching and learning process be interactive, engaging and dynamic, as students increasingly have access to information quickly and effectively (Pereira, Araújo Filha, Miranda & Zanardi, 2018).

Active methodologies can be understood as a strategy used by teachers in the teaching and learning process in order to provide students with critical and reflective training. Yet, such methodologies favor the students' autonomy, making them look for ways to conduct their learning process and are based on the students' experiences to solve problems within the most varied social contexts (Berbel, 2011).

In light of this scenario, active methodologies arise with the aim of stimulating educational processes for the construction of reflective thinking, so that the student can be active in their learning process, surpassing the traditional educational model. This perspective of student participation in the acquisition of their knowledge allows them to develop their own way of learning. This is a resource for critical and reflective training, in which interaction in the classroom makes the student a protagonist and gives him autonomy. This aspect encourages each person's creativity, as well as respecting individual and collective differences and experiences, integrating the most different social realities (Moreira & Ribeiro, 2016).

In active learning, the student is the protagonist of their learning and the teacher acts as a mediator of the entire teaching and learning process. It is they who will guide your studies in the most coherent and appropriate way according to their needs. From the moment that the teacher starts using an active methodology, they are encouraging the student to think, criticize, reason, observe, in short, it provides a construction of reflective and critical knowledge (Barbosa & Moura, 2013).

For the development of this study, the Problematization Methodology with the Arc of Maguerez was adopted, that was widespread in Brazil by Bordenave & Pereira (1982). The arch structure was adapted from a proposal for teacher training, supported by the premises of Paulo Freire, Jean Piaget, David Ausubel, among others, announcing the methodology as a form of problematizing education (Berbel, 2012; Teixeira, 2016). According to Berbel (2012), the richness of this methodology is in its characteristics and stages, which mobilize different intellectual abilities of the subjects, demanding, however, willingness and efforts by those who develop it in order to systematically follow the structure of the arch and its basic orientation, to achieve the intended educational outcomes.

Studies such as the one by Macedo et al. (2018) reinforce the use of this methodology in teacher education, as they emphasize that the experience based on PM can enable teachers to know, discuss and reflect on active methodologies as innovative strategies. Still, the methodology provides opportunities and forms for the

application of active learning, in addition to contributing to transforming teaching practices, so that they build possibilities for action in the educational institutions where they work.

In this sense, active methodologies are important for the development of a more dynamic teaching and learning process, which is always under constant construction within the educational environment. Thus, the present work aims to understand teachers about active methodologies before and after a training course, as well as their evaluation and possible use in the school context.

Methodology

The present study is an excerpt from a Master's thesis of the Graduate Program in Science Education: Chemistry of Life and Health and is characterized as a qualitative, exploratory and descriptive research in its development (Gil, 2010). It was approved by the Research Ethics Committee of the originating institution, under opinion nº 3.457.365.

Twenty-one teachers from the final years of elementary school from a municipal public school on the western border of Rio Grande do Sul participated in the study. The teachers were invited to voluntarily participate in a training course with weekly meetings at the school and in their teaching activity. Both at the first and last meeting, questionnaires were applied (Table 1) with open-ended questions to check teachers' understanding of active methodologies before and after the proposed intervention, as well as evaluating the course's development.

Table 1. Examples of questions answered before and after the training course.

Initial Questions	Final Questions
1. What do you mean by Active Methodologies? 2. What methodologies do you know? How did you come into contact with these methodologies? 3. Do you use any of these methodologies as a teaching tool in your classes? What active methodologies? If not, why not use active methodologies? 4. Do you know the Problematization Methodology (PM) based on the Arc of Maguerez? If so, where did you get access to this methodology? 5. Have you ever either used PM based on the Arc of Maguerez or do you use it in your classes? If you have already used it, briefly comment on the results obtained.	1. What do you mean by Active Methodologies? 2. After the course, do you believe it is possible to use the PM based on the Arc of Maguerez in your classes? Justify your answer. 3. What were the main motivations that led you to participate in this training course? 4. Have this course contributed in any way to your teaching practice? 5. Did this course contribute in any way to your teaching practice?

Source: Authors.

At the first meeting, we sought to list topics which the teachers themselves needed to study and would like to be addressed during the course. The purpose of the course was to discuss the importance of professional teacher training and the use of active methodologies in the school context. Based on the themes reported by the teachers, contextualization forms were worked out following the structure of the Problematization Methodology with the Arch of Maguerez (Bordenave & Pereira, 1982) and its five steps: Reality observation, Key Points, Theorization, Solution Hypotheses and Application to Reality. The course development structure was based on Table 2.

Table 2. Arc of Maguerez.

1st Meeting	2nd and 3rd Meetings	4th Meeting	5th Meeting
Reality Observation and Key Points	Theorization	Solution Hypotheses	Application to Reality
Diagnosis of the teachers' formative reality; Problematization of themes in the school context;	Theoretical/scientific foundation according to the problems;	Elaboration of strategies to solve the listed problems;	Share with others the entire route developed through the arch;

Regarding to data analysis, responses were analyzed based on Bardin's content analysis (2016), which consists of the pre-analysis, operationalization phase and systematization of initial ideas; in the exploration of the material, where the coding, decomposition or enumeration takes place; and in the treatment of results, in inference and interpretation, aiming at significant and valid results to describe teachers' understanding of active methodologies before and after the training course.

Results and discussion

The presentation of results begins with the teachers' understanding of active methodologies before and after participating in the training course offered by the researchers. For a better visualization of these results illustrating the categories that stood out the most, we chose to present word clouds (Figures 1 & 2).

Initially, for some teachers active methodologies would be effective methods for 'teacher and student discomfort' due to the modifications, and the exploration of different spaces, studies in a cooperative and interactive way. Other teachers understood as a method that works with research, activities outside the classroom, activities with media; which is not wrong, but a vague conception of active methodologies is perceived, linked more to the 'pedagogical aid tool' than to the active methodological stance.

Figure 1. Teachers' understanding of active methodologies before the training course.
Source: Authors.

As for the approach to the disaccommodation of the subjects, Silva & Scapin (2011) corroborate the findings of the study saying that active methodologies can be defined as a set of techniques that transform the school environment at the same time that the role of the teacher and the student is modified, in the search for greater student autonomy in the construction of knowledge. Still, Valente (2018) argues that active learning methodologies consist of a series of techniques, procedures and processes used by teachers during classes, with the aim of helping students' learning. The fact that they are active is related to carrying out pedagogical practices to involve students, engaging them in practical activities in which they are protagonists of their own learning (Valente, 2018).

It is important to emphasize that choosing a methodology alone would not be the solution, as it does not guarantee effectiveness, it does not transform the world or even education. An example given by Diesel, Baldez & Martins (2017) is the work with concept maps, considered an active method since students, most likely in groups, are the main agents and will act autonomously in their elaboration. However, if the work with the map does not have a clear objective on the part of the teacher and the teacher does not provoke the students considering this objective, this strategy can be questioned. It is believed that to achieve the intended results, it is necessary for the teacher to understand the methodology used in such a way that his choice translates into a clear conception of what he intends to obtain as a result (Diesel et al., 2017).

Even before the course, the teachers were asked about which active methodologies they know and whether those marked as known are used in the classroom. Among the responses, 72% of teachers say they know and use active methodologies in the classroom, but of this amount only 38% mention which methodologies are used (project-based learning, problem-based learning, problem situations and problematization methodology). It is noteworthy that the rest who say they use active methodologies do not list what these would be, 19% say they 'guess' they use it and 09% do not really use it, as illustrated in the following statement: "Teacher 03 - If I use it, I use it without knowing it has this name. Thus, I reveal my limited knowledge on the subject".

Active methodologies have a wide variety of teaching strategies such as: problem-based learning, problem-solving, project-based learning, peer learning, design thinking, case method, inverted classroom, among other possibilities (Fonseca & Mattar, 2017). Active methodologies are based on the way to develop the process of learning through experiences, aiming at solving challenging issues arising from your daily life

(Berbel, 2011). According to Diesel, Baldez & Martins (2017) there is still a certain difficulty in inserting this method into teaching practice. For them, the adoption of this type of teaching methodology requires, in addition to a certain knowledge, the daring to innovate in the educational field. (Diesel et al., 2017).

Meanwhile, the study by Soares, Engers & Copetti (2019) takes care to better understand teacher training using active methodologies, as it is based on the assumption that some teachers may not have knowledge about the topic or even have no contact with the methodologies discussed throughout of their training and professional performance. Such a statement may be related to several factors, such as being so immersed in traditional teaching that they would not be able to understand the methodological process of the different methodologies (Soares et al., 2019). Still, according to the study by Nascimento & Gomes (2020), all teachers, when investigated in this work on active methodologies, agreed that the use of these as a methodological strategy can significantly contribute to the teaching and learning process of students, with the ability to minimize their difficulties and disinterest (Nascimento & Gomes, 2020).

When resorting to the analysis of the same question about the understanding of active methodologies after the intervention, it becomes even clearer for teachers that these are 'methodologies in which the student is the protagonist', the 'main responsible' for their learning process and that the 'teacher is the mediator' for the student to build their knowledge, as can be seen in Figure 2.

Figure 2. Teachers' understanding of active methodologies after the training course.
Source: Authors.

Below, we can observe the understanding of educators about active methodologies after the training course, through some extracts:

> Teacher 13 - Methodological process that involves, in addition to the education professional, who does not have knowledge, but treats and leads the student to be the protagonist and subject of knowledge.

> Teacher 19 - I understand by Active Methodologies that the role of the student is more evident, the teacher as a mediator/instigator who provokes the student to build and solidify their knowledge.

An evident point of the expansion of teachers' knowledge about the concept of active methodologies is that the discourse prior to the course was about the student as being the center of the teaching and learning process, being autonomous, and the teacher should make use of subjects of the student's interest. Not that this understanding is wrong, but it is known that the understanding of active methodologies is much broader, which can be seen in the understanding of teachers after the course, as expressions such as 'problem solving' and 'meaningful learning' appear as a direct relationship about your understanding. Relating the teachers' speech to studies in the area, Bacich & Moran (2018), in line with the study by Dolan & Collins (2015), state that:

> The teacher as an advisor or mentor gains relevance. Their role is to help students go beyond where they could go on their own, motivating, questioning, guiding. Until a few years ago, it still made sense for the teacher to explain everything and the student to write down, research and show how much they learned. Studies reveal that when the teacher talks less, guides more and the student actively participates, learning is more significant (Bacich & Moran, 2018, p. 4).

Based on the aforementioned assumption, it appears that active methodologies go beyond the student as the center of their own learning, it also involves the construction of knowledge through problematization as a means of bringing reality closer to theory. Diesel, Baldez & Martins (2017) defend the idea that education

developed in the classroom should be useful for life, providing students with the articulation of knowledge with practice, therefore, a contextualization of theory and reality. Still, the aforementioned authors show that as learning involves the problematization of the reality in which the student is inserted, it provides for the exercise of reflection, observation, comparison, among other skills, causing the student to have a critical-reflective training.

Studies in the area (Berbel, 2011; Silva Pinto, Bueno, Amaral, Menezes & Koehler, 2014; Moran, 2015) bring a broader view of the active methodologies that corroborate the findings after the training course. According to them, the purpose of active methodologies would be to create learning situations in which students do things, put knowledge into action, think and conceptualize what they do, build knowledge about the contents involved in the activities they carry out. In addition, students develop cognitive strategies, critical skills and reflection on their practices, provide and receive feedback, learn to interact with peers and teacher, and explore personal and social attitudes and values (Valente, Almeida, & Geraldini, 2017).

In this perspective, Copetti, Soares & Folmer (2018) understand that the use of active methodologies is configured as a potential strategy that provides input for teachers and contributes to the student's teaching and learning process in a more meaningful and collaborative way. Thus, the teacher, based on the adopted methodology, offers autonomy to the student, positioning himself as a mediator in the knowledge construction process. Also, Hino, Skora & Motta Filho (2018) report that the teacher should stop being the protagonist in the classroom and become an influencer of ideas and experiences that allow students and teachers to come closer in the construction of knowledge.

Another issue previously analyzed was the knowledge of teachers about the Problematization Methodology (PM) and whether they have already used it in the classroom. It was found that the majority (67%) of teachers do not have knowledge about PM and those who report having knowledge about it (33%) note a certain doubt in the answers. This is because teachers assume that the methodology used is problem-based learning, where the student takes a problem question and the class is taught from then on. Something that confirms this statement is that only one teacher mentioned using the PM in the previous question and even detailed it in its stages. The following are extracts with the answers of the teachers who guided the analysis carried out.

> Teacher 05 - I agree with working on the problematization, and the results are good as it focuses on what is essential for the student.
>
> Teacher 16 - If this methodology refers to bringing the problem or finding it within the dynamics of the class, or even a student bringing it and from there the class is developed, then I know it.
>
> Teacher 18 - Yes, we had an integrated seminar course in which we used this methodology. The results were positive, as the research carried out by the students is closer to reality.

According to Lovato, Michelotti & da Silva Loreto (2018), most teachers see all learning as active, as they consider that the student, when participating in an expository class, is active in the learning process, but cognitive science studies argue that students must do more than just listen to be effective their learning (Meyers & Jones, 1993). The different forms of active methodologies are often confused due to their similarities, that is, there is a difficulty in differentiating collaborative learning methodologies from cooperative learning (Lovato et al., 2018).

Still on the divergence between active methodologies, teachers confuse 'problem-based learning' and 'problematization'. Although the two have as common point the solution of a problem, the approach of each one is different. While in 'problematization' students identify the problem by observing reality, in 'problem-based learning' the student is presented with a problem previously elaborated by the teacher who will be the facilitator for the solution (Berbel, 1998; Lovato, Michelotti & Silva Loreto, 2018).

Even with similarity, the proposals of active methodologies are different and depending on the acting posture of the teacher in the classroom, not everything that is used in the classroom can be considered as active methodologies. So, it is believed that to really be an active methodology requires the participation, collaboration and cooperation of the student throughout the process. In addition, it is necessary that teachers have knowledge and mastery of the methodologies to be used to apply it correctly, providing an efficient and productive learning process for the student. In this sense, we present below the details of the structured training course based on the methodology of problematization with the Arc of Maguerez.

Teacher training course structured on the problematization methodology

This course was organized according to the availability of school hours. The total workload was 20 hours, divided over 05 meetings, one each consecutive week. To structure the course, we used the PM based on the Arc of Maguerez (Bordenave & Pereira, 1982), as well as a field diary for the annotation of reports that might arise during the course. Next, each step of the methodology and what was done in this step during the course are described.

1st & 2nd steps (Reality observation and key points)

It refers to the first meeting with the teachers after the application of the initial questionnaire. In this, the analyzes previously collected on the profile of teachers were presented, as well as their understanding of professional training and its importance for teaching practice. Soon, the teachers were invited to watch a reflective video about the teacher's performance, and then viewed some photos of the school context with the following question in the image: 'What are the most urgent training needs in the school environment?' To answer this question, teachers were instructed to form four groups for reflection and discussion on the questioning.

After a time of discussion between the groups, the themes listed in each group were: Group 01: sexualidade (pregnancy, sexual orientation, respect for women); Group 02: emotional health (emotional health of students and teachers themselves); Group 03: student reality (diagnosis about the reality of the students' family daily life and what to do to help them); and Group 04: interdisciplinarity (how to work interdisciplinary at school?). The teachers themselves organized communication groups on WhatsApp for the dissemination of material for reading and communications made by the proponents who were in charge of subsequently sending materials that served as a subsidy for the 3rd step, described below.

3rd step (Theorization)

Two meetings were organized to carry out this stage, one for the themes of groups 01 and 02, and another meeting for the themes of groups 03 and 04. At the meeting referring to the themes 'Sexuality' and 'Emotional Health,' a discussion was held on the materials sent as support, referring to each theme, sent a week before to allow for reading. At this meeting, a discussion on the topic of sexuality began, in which was invited a nurse working in a Family Health Strategy in the neighborhood to which the school is a part, so that teachers could ask about doubts regarding to sexuality that caused a certain inconvenience in the classroom.

In this part of the meeting, there were many reports of situations in which students expose facts about sexual relations, use of drugs or contraceptives and the parents themselves do not know. Also, teachers reported the need to work on sexuality from the early years, as students arrive in the final years with a knowledge gap, as well as many topics already seen as taboo, leaving many doubts and lack of knowledge that teachers of final years cannot contemplate due to the content already proposed that must be completed during the school year.

In the second part of this meeting, the theme was Emotional Health. The coordinator of the Center for the Valorization of Life (CVL) located in the city was invited to talk about this topic. He spoke about the importance of being aware of signs (sudden changes in behavior in adolescents) such as self-harm that often comes from excessive sadness or anger, and which are not always related to depression. Some of the teachers reported identifying students with signs of self-harm, especially on the wrist, others report having students with depression who use anxiolytics. The coordinator spoke about the importance of listening to these young people without judging them and about any more serious symptoms seeking specialized help.

Below are some of the professors' statements during the conversation with the CVL coordinator:

Coordinator: Why do you think someone causes self-harm?
Teachers: To call attention.
Coordinator: What feeling generates self-mutilation?
Teachers: Pain, anger, etc.
Teachers' speeches during the conversation:
Teacher 01 - The teacher thinks the student is lazy, that he does not want to do anything.
Teacher 02 - It is not just any kind of help that should be given, it should be the right help, as the teachers are becoming a sick class.
Teacher 05 - I took a student for a walk, to talk, I paid attention and she improved a lot.
Teacher 03 - We are not just teachers, we are friends, mother, father, psychologists...

The second meeting addressed the themes of 'student reality' and 'interdisciplinarity,' and these themes also had subsidies from materials previously distributed for reading. Proponents of the training course searched for material about the neighborhood (Family Health Strategy and Socio-Anthropometric Questionnaire, carried out by an institutional program developed at the school) to assist in the discussion, but there was a consensus among teachers in arguing that 'reality is something changeable, and perceptible in a different way by each person' (spoken by one of the teachers). Reality is a product of human interaction so it is not something static, finished or unchanging. It is built by man and is in a constant process of construction (Pábis, 2012).

Due to this subjectivity, it was proposed to the teachers that they build an instrument to collect information about the students' reality, questions that were pertinent to them and that could answer the teachers' doubts about the students' reality. Each teacher was responsible for applying the instrument with one of the eight classes in the final years of elementary school. This instrument, after being developed and previously applied, was authorized by the school's management team, with the sole purpose of identifying problems that could serve as an input for teachers to use as a way to bring the reality of students closer to the programmed contents, or even as way of understanding certain situations in the classroom.

Continuing the discussions, now about interdisciplinarity, the teachers argued that both themes are linked, because, when carrying out work aimed at the student's reality, an interdisciplinary project is needed, where several teachers can work together in their different areas. It was then noticed that the two groups were dialoguing as a large group and not divided in their initial themes, thus, a teacher's suggestion was followed 'let's leave a single group, we will all be able to work together.' So, after the groups were united, the proponents continued to instigate what is the difficulty perceived by the teachers to carry out interdisciplinarity in a real way in the school:

> Teacher 01 - In the 'Garbage Project,' which are with the subjects of Portuguese, religion and arts, and we are trying to invite science, but it is each teacher in his/her subject.
>
> Teacher 02 - Reorganization of school planning, time to work in teams, in groups.
>
> Teacher 03 - For integrated work to happen, there has to be an exchange of knowledge. We have evolved a lot, with a few years of schooling. First of all, let's discipline the planning, then discipline the evaluation.

The teachers' enthusiasm in applying the organized instrument was perceived, but not momentarily, but being reapplied every year to better understand the demand of students who are part of this school environment:

> Teacher 04 - It must be systematic, apply now and at the beginning of the year.
>
> Teacher 05 - Let's tabulate the data to see what dots come up.

Finally, the final version of the questionnaire was organized with twenty questions so that students could only mark yes or no. It was agreed among the teachers who would apply the instrument in each of the classes, and that after applying the material and collecting the information, they would still read it to carry out a brief analysis for discussion in the large group at a later meeting.

4th step (Solution Hypotheses)

Teachers were challenged to create solutions to the problems listed, so that the themes could relate to the contents of the different areas of the teachers involved in each group. The initial idea was that the course would serve as a subsidy so that teachers could create projects, or activity structures for future applications, or in the course of their routine activities.

However, based on the speech of one of the professors, the way of handling this material was rethought. This teacher argued about the need to monitor the process of carrying out the activities that are worked on in the training courses, as they learn while they are in the course, but there is a need "[...] for someone to guide what needs to be done, and correct it in case something goes wrong." (speech of Teacher 02). This speech triggered others, as Teacher 07 reinforces, "[...] sometimes the activities do not work out because there is not someone to take care of it, monitoring it, providing feedback on what is working and what is not according to plan." This situation is discussed by Marin et al. (2010) where they emphasize that the lack of familiarity with the method can awaken in the subjects a feeling of insecurity, at least initially. In addition, the lack of success with the method may be associated with the lack of appropriate support from those who propose them (Wood, 2004).

This stage was then reorganized, and it was proposed to create some projects within the themes of the groups, and after the creation of these projects, the researchers would be responsible for joining the three projects, creating a broad and single project, for presentation to the management team of the school and subsequent application in the final years of elementary school. The three projects were designed in separate groups, so that each project had a coordinator (responsible for demanding tasks), a writer (who would put the ideas on paper) and the executing team (all teachers in the group). Another point considered was that the projects could include students from the 6th to 9th grade of elementary school. Each of the projects should contain a description of the objectives, the methodology to be applied and the execution schedule.

Still, for the proposal to create a large interdisciplinary project to be accepted by the teachers, to be organized and carried out with the help of the proponents of the training course, it would be necessary for the management team to also agree. The teachers' report is that many of the projects started at the school ended up being lost due to other project proposals that arrived and ended up overloading the teachers. What, in the teachers' view, hinders the valid learning of new pedagogical practices.

5th step (Application to Reality)

In the final stage of the application to reality course, each of the three project proposals by the groups of teachers was presented (sexuality, emotional health and interdisciplinarity, which was combined with the theme of the student's reality). Each of the groups presented their ideas, and the teachers contributed suggestions, or even talked among themselves, talking about the possibility of adapting similar activities to their thematic project. At the end of the explanation of the three groups, the proponents performed a re-presentation of the entire process followed throughout the course, so that all the steps of the Arc of Maguerez were clear. Furthermore, they were responsible for organizing the interdisciplinary project covering the three thematic projects, to be carried out later.

It was agreed with the school management and the teachers that the proponents will carry out the organization and planning of the activities of the interdisciplinary project together with the teachers. Also, throughout the execution of the activities, the researchers will be in direct contact with the school to help the teachers in the project development process, identifying the potential and also the difficulties of the teachers. The purpose of this follow-up is to help them put into practice and complete the project in a meaningful and transformative way for the reality of this school.

After the training course, the teachers were asked about the possibility of using the PM with the Arc of Maguerez in their classes; 81% of the teachers said they were safe and able to apply it in the classroom. Still, 19% believe its application is possible, but they still need support during the application of the methodology in class, as they do not feel completely secure. Corroborating with the findings, when Gemignani (2013) talks about teacher education, argues that more than enabling the mastery of knowledge, there is a need to train teachers who learn to think, to correlate theory and practice, to seek, in a creative and appropriate way, to solve problems that emerge in the daily life of the school and in everyday life. Teachers able to add transformations to their practices for themselves, as the traditional method has proven to be ineffective and inefficient due to the demands of social reality.

In addition, teacher education initiatives hardly consider subjective factors associated with teachers, such as personal and professional expectations, their needs and the various particular variants of their work environments. Disregarding such factors is an attitude that minimizes the potential of these initiatives, considering that knowing them is an irrefutable premise to provide contributions and develop skills that help such professionals to act in a way that no longer reproduces static and fragmented education in which were formed, but rather, a critical, comprehensive and dynamic education (Nascimento & Gomes, 2020).

Continuing, the analyzes carried out in relation to the motivations that led teachers to participate in the training course and whether it contributes in any way to their teaching practice, it is noted that educators are concerned and willing to seek new knowledge. They report that they wish to have 'moments of interaction with colleagues,' which provides opportunities for the exchange of experiences, in addition to the fact that participation in training courses provides a professional qualification and are moments of reflection on their teaching practice.

> Teacher 07 - Knowing new subjects, living new experiences and reflecting on my performance.
>
> Teacher 08 – 'Teaches' a new method of work, soon after by working on a subject chosen by the teachers, also by the support of material and by the organization.

> Teacher 20 - Due to the condition of learner, for not knowing everything about the 'whole,' for the opportunity to share a little of our experiences, practices and certain certainties, also to align what the academy is today, thus providing conceptual updating.

As for the evaluation of teachers about the training course, they unanimously reported that the course was very fruitful, that it provided growth and reflection on their professional practice. Another aspect mentioned by the teachers is that the course had a clear, practical, accessible and flexible methodology where they felt part of the process as a whole and were not just spectators. And that is why the educators highlighted that the course contributed to reflection on pedagogical practice, as well as providing the acquisition of new knowledge and clarified what active methodologies are. Here are some extracts exemplifying:

> Teacher 10 - Very good course. Currently, being a protagonist in the courses is worth more, as we manage to learn what is being studied, rather than being mere spectators.

> Teacher 12 - The course was very fruitful, as it allowed a special look at the student and a self-reflection table. The methodology was clear and pointed to the simplicity and complexity of developing the proposal in our time.

> Teacher 20 - As an opportunity to put into practice a transformative education, one that starts from reality and enables other ways, other ways of thinking, changes, looks for another focus, also the fact of not being afraid of having 'other looks' - if we dream of changes of paradigms, it is because we are capable/let's fight!

A lot of enthusiasm in the speeches extracted from the responses of the teachers was perceived, which becomes a motivational factor for them to remain engaged in the proposal they organized and for the proponents it is a motivation, in the sense of continuing with actions like this whenever possible. We agree with Arão, Silva, Lima & Santos (2018) when they argue that, when the educator is urging the student to think, reflecting, going in search of the construction of their knowledge, is making them become an active being in their educational process which disturbs both student and teacher.

Two authors who discuss teacher training are used to corroborate the educators' statements. First, we agree with Imbernón's (2001) thinking, where he says that teacher education must be linked to tasks of curriculum development, program planning, improvement of the educational institution in general, and in them "[...] getting involved, trying to solve general or specific problematic situations related to teaching in its context" (Imbernón, 2001, p. 18). On the same thought, Nóvoa (2002) says: "[...] to speak of continuing teacher education is to speak of the creation of a network of (self) participatory training, which allows for an understanding of the subject's globality, assuming training as an interactive and dynamic process" (Nóvoa, 2002, p. 38).

It is also necessary a continuous training process that mobilizes teachers to collective and interdisciplinary work, shifting the perspective of training centered on instrumental aspects to a perspective that considers the teacher as an agent of himself, capable of critically analyzing and reflecting on its knowledge and practices in articulation with the context in which it operates (Paez & Pereira, 2017). In this sense, regarding aspects to improve proposals such as the one presented in this article, the teachers report that the course was very dynamic, with enriching questions and discussions, which in some speeches the teachers asked to continue in the same format. One point that remained as a suggestion for improvement for the next training courses was that there be more meetings (extend the workload) so that discussions could be even more fruitful.

Final considerations

When considering the teachers' understanding of active methodologies, a change was not noticed after participating in the course, but a broader view on the understanding of the theme. Teachers not only considered the student as the main subject of the process, but also identified their role in it. A fact that possibly made them reflect were the various readings throughout the training course, as well as the reflections carried out during the face-to-face meetings.

The interest and commitment of the professors in putting into practice everything learned in the course were made explicit. Despite reports that the completion of the course took place in a short time, it was very rich in teachings. What was noticed throughout the study is that the main challenging factor for teachers to use active methodologies is their insecurity in performing innovative practices. As well as the lack of follow-up in your first attempts to use it. Such monitoring can generate greater confidence in the teacher and, as a consequence, greater engagement in the development of innovative activities and proposals.

Regarding the use of PM based on the Arc of Maguerez, teachers were perceived to be motivated throughout the course. It is believed that the good evaluation of the methodology for the development of the course was due to the PM having as one of the positive points, the use of reality as a basis and the clear definition of its stages for the development of the proposal, so the teachers were able to observe all of them throughout the course. Attention is drawn to the need for a greater number of meetings so that the discussions generated throughout the stages are more satisfactory for teachers.

It emphasizes the need for actions like this, as well as monitoring during and after the activities are carried out so that training courses can increasingly be effective in changing methodological postures. Certainly, these actions demand studies, reading time, availability for meetings and organization of training schedules at the school. However, its fruits, in the long term, are more qualified teachers who are engaged in providing opportunities for methodologies that enable improvements in the quality of teaching offered to students.

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