Revista ARACÊ
ISSN: 2358-2472

INTENSIVE MATHEMATICS COURSE FOR SAEPE 2024 WITH THE USE OF METHODOLOGICAL RESOURCES: PROBLEM SOLVING AND AFFECTIVITY

https://doi.org/10.56238/arev7n4-056

Submitted on: 03/07/2025 **Publication date:** 04/07/2025

Agnaldo Ferreira de Melo[1], Márcia Colaço Ferreira de Melo[2] and Danielly Ferreira de Melo[3]

ABSTRACT

This research analyzes the teaching-learning process of students, through methodological resources, affectivity and problem solving, in the intensive SAEPE (Pernambuco Educational Evaluation System), held in November 2024, with 100 students from the 3rd year of high school in a state public school in Goiana-PE, seeking to analyze these conceptions from the research of some of the authors who discuss this topic, among them: Henry Wallon (2016) and Polya (1996). Polya's method consists of three steps: understanding the problem, designating a plan, and executing the plan. The mathematics of affection and the Polya method are possibilities in the teaching-learning process of students and need to be considered by mathematics teachers, that is, we need to be transmitters of autonomy, affectivity, trust, protagonism, as well as facilitators in providing opportunities for such situations. Therefore, in the path of teaching problem solving, teachers and students are mutually touched during the process of training and observing the issues. The expansion of cognitive development is also maximized through affection and the ability and competence to express one's feelings. From this perspective, it was observed that the challenge of affectivity and problem solving is shared among all the subjects involved in the school environment.

Keywords: Mathematics. Affection. Problem solving.

[1] Prof. and Dr.
Christian Business School - CBS, Florida - USA
E-mail: agnaldo.fdmelo@professor.educacao.pe.gov.br
ORCID: https://orcid.org/0009-0007-5859-1826
[2] Ms.
Master in INTENSIVE ICU from IBRATI Brazilian Institute of Intensive Care and Psychology student from FPB.
E-mail: marciacolaco27@gmail.com
ORCID: 0009-0000-1555-926X
[3] Dr.
Christian Business School - CBS, Florida – USA
Email: dany26258@gmail.com
ORCID: 0009-0002-6087-4271

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ISSN: 2358-2472

INTRODUCTION

It is traditional, in the various paths of mathematics, that investigations are transformed into some processes of methodological resources, such as: affectivity (emotional and intellectual development) and problem solving (comprehension, elaboration and execution) because these actions, even with several challenges, drive mathematics educators, especially those directed to research and the progress of scientific investigations by Wallon (2016) and Polya (1996).

However, affectivity and problem situations are not exclusive and discovered only in the scientific context, but also in our daily lives, when we are faced with them, whether they are restricted, private or collective, they all need a decision.

We can explain as a group problem, the mathematical problems, which are directed to be solved through the use of affectivity for greater effectiveness in the teaching-learning process, where teachers need to interconnect subjectively and singularly, and must be attentive to the specificities of each student, adapting their teaching approaches and developing a safe and positive environment in the classroom. Thus contributing to the resolution of the difficulties of basic mathematics, not discarding the methodological resource of problematization and contextualizations existing in internal activities (simulations and group work) and external activities (ENEM, SAEB and SAEPE), without leaving gaps from previous years.

It is worth noting that, observing the evaluation carried out in November 2024, in Pernambuco, the commitment of students was highlighted, mitigating gaps that previously existed. However, even though there have been increasing improvements in all descriptors used in the state network, technological investments are needed, such as: internet, computers, Datashow and training for professionals in the area of education, including training for psychologists who work in this area, to build a holistic view of the student among teachers.

According to Wallon (1975), we can understand that, " Development only becomes possible through the integration of the three psychic dimensions: **the motor, the affective and the cognitive**, conditioning a connection between the organic equipment of the individual — the body — and the environment and social environment in which he lives. "

Therefore, in the path of teaching problem solving, teachers and students are mutually touched during the process of training and observing the issues. The expansion of cognitive development is also maximized through affection and the ability and competence

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ISSN: 2358-2472

to express one's feelings. The challenge of affectivity and problem solving is shared among all the subjects involved in the school environment.

It is important to highlight that one of the pedagogical roles of the teacher is to constantly reveal to his students his competences, skills, clarity, affectivity and coherence between what he says and what he does. That is, to stimulate questioning, criticism, curiosity and questioning through dialogue between teacher and student. One of the roles of the learner is to think, understand, solve problems and apply the knowledge acquired in different situations.

DEVELOPMENT

Initially, it is worth noting that the problem needs value and relevance not only for the teacher, but also for the school and scientific community, seeking to solve them with affection, which can also alleviate anxiety.

The resolution of the problem is based on an existing conjecture, since its creation needs to be well contextualized theoretically and, consequently, the resolution needs to be probably solvable, to draw lines of reasoning.

Thus, the definition according to Kerlinger (apud HUETE and BRAVO, 2006. p. 109), highlights that for the problem to be considered scientific research, it needs:

- To be relevant, that is, its resolution has to be of interest to society;
- Be formulated precisely, unambiguously;
- To be grounded, that is, framed in some theory;
- Solvable being: susceptible to empirical verification, that is, that humanly can formulate a hypothesis with a possible solution.

From this perspective, Polya (1995, p. V) confirms the importance of solving a problem, that is, taking advantage of the correct way to solve it:

> A great discovery solves a great problem, but there is always a discovery match in the solution of any problem. The problem may be modest, but if he defies curiosity and brings inventive faculties into play, whoever solves it by his means will experience the tension and enjoy the triumph of discovery. Such experiences at a susceptible age may engender a taste for mental work, and leave their mark on the mind and character throughout life.

Individual activities are directed towards the formation of a harmonious whole, a personal effort to overcome their difficulties, and the teacher needs to see possibilities

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where there was not always an expectation. Therefore, problem solving has as one of the objectives to allow the student to achieve personal fulfillment.

We see that contextualization represents a sense for the teacher and student, together, to try to solve the problem responsibly and safely.

According to Pais (2001, p. 27):

> The contextualization of knowledge is one of the most important pedagogical notions that should occupy a more prominent place in the analysis of contemporary didactics. It is a fundamental didactic concept for the expansion of the meaning of school education. The educational value of a discipline expands to the extent that the student understands the links between the content studied and a context that he understands. (Apud SILVA and RIBAS, 2003, p. 80-81)

Following the conception of contextualizing problem solving, we have the problem-situation recurrently appearing in textbooks:

> One of the terms most used lately by teachers and documents dealing with issues related to the teaching and learning of Mathematics is, without a doubt, that of "problem-situation". What has caught my attention, however, is the wide variety of interpretations given to the term, among which, the one that seems to me to be most used is that of "a contextualized problem" (CAMARA SANTOS, 2002).

It is not complex to identify in elementary schools in the state of Pernambuco the aversion to problem solving. Some education professionals, teachers, by implementing novelties through the emotional and affective area, make the teaching of mathematical activities lighter. Following this permission, the problems presented in SAEPE seek the context of this student not only in the classroom, but also in their family context, working to overcome the obstacles of each student individually.

According to Xavier (2016, p.90):

> [...] The issue of establishing a feasible educational plan satisfactory to the apprehensions of Greek society continued to be a barrier to be overcome. It was then that the figure of Socrates (470-399 B.C.) emerged, who, based on the maxim of the sophist Protagoras, who postulated that "man is the measure of all things", who starts from the principle that, to reach the intellectual apex, man needs, first of all, to know himself.
> It is from the formation of individual conscience that man should seek to understand the purpose of life and education. Thus, education should not be based on superficial or fragmented information to be used on certain occasions, but should awaken in the mind of the being his ability to try to understand things from the individual experience of each one. It is from giving birth to the ideas of the individual's consciousness that real knowledge is achieved.

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It is worth noting that the bond between teacher and student must be built by providing a safer and more positive environment in the classroom, where students feel free to express their emotions, overcoming, on both sides, the insecurities exacerbated by the belief that the traditional methods, with which they are more familiar, are sufficient for the teaching-learning process. Dialogue through affection is of fundamental relevance because it favors the production of knowledge in an interactive, pleasurable and creative way.

Still in the same context, students learn satisfactorily when they are involved in practical and interactive activities. This implies that education should be more experience- and action-centered, providing opportunities for students to actively explore, experiment, and interact.

Pires and Silveira (2022) discuss the place of teachers in mathematics degree courses, pointing to the study by Carneiro and Passos (2009, p. 789), reflecting that:

> For the authors, a possible reflection refers to the fact that, probably, teachers (teacher educators) also did not have, in their courses, disciplines that discussed and reflected the specific methodological trend they are addressing. In this way, "they train students (teachers in training) without having been trained themselves" and, thus, these teachers improve the way they teach these disciplines, basing their experiences on the literature of the area (Pires; Silveira, 2022, p. 488).

In addition, the lack of time of most teachers, due to the extensive workload, makes it difficult for them to seek qualification on their own. Many education networks, both public and private, do not offer the necessary support, resulting in teachers who have no difficulty updating and developing new teaching methodologies.

It is important to highlight that the perception of dependence on innovative methods can create a psychological barrier against the adoption of new pedagogical approaches by negatively using affectivity.

The formative aspect mentioned alone would bring a set of obstacles, however, other points need to be considered for the state of Pernambuco to succeed in the area of knowledge worked. It is not uncommon in state schools, especially in public schools – peripheral, rural, quilombola and indigenous, prison, etc – the lack of access to adequate technological resources, the limitation of time to adapt to new tools, as well as a precariousness in the infrastructure that makes it almost impossible to implement innovative technologies, which includes both the availability of technological devices and the technical and pedagogical support to use them effectively (Ceolim; Caldeira, 2017).

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It is imperative to mention Wallon (2016), when he ratifies that the individual is a being who thinks, feels and acts. He sees development as a continuous process rather than as rigid and separate stages, suggesting educators adopt a holistic approach to teaching, considering the multiple dimensions of individual development. The aforementioned author emphasizes the importance of the integration between body and mind in the teaching-learning process. For him, knowledge is a passage that we can use to be part of something.

Thus, D'Ambrósio (2009) fosters that the present, as a connection between the past and the future, is represented by action. This didactic connection will only be likely when everyone remains active in the sociocultural learning that involves Mathematics in the school environment and their daily lives. Corroborating with the social environment, Vygotsky (1999) emphasizes that the cognitive development of the student occurs through social relationships.

The affection placed in what you do gives it a new shine. Thus, in order to practice an education with affection, we need to acquire control over emotional reactions, recognize our feelings, know how to live harmoniously with people and know how to reveal our feelings with assertiveness, exercising sensitivity and expressing affection in coexistence.

Therefore, Junqueira and Oliveira (2024, p.3) state that

> Gestures, pantomimes, and facial expressions should be observed, as they are part of emotional activity. Affective communication helps to alleviate these moments, as a person puts themselves on the other side to offer support and affection. In these situations, it is important to express love. The educator must have technical knowledge acquired through his training and an objective attitude towards the children [adolescents] in his care. In this way, it is the responsibility of the educator to protect children [adolescents] from their own intense and aggressive emotions by providing the necessary guidance when they [they] need to resolve these immediate situations.

Physical and practical activities, as well as intellectual activities, must be integrated into education to promote balanced development (cognition and emotion). Therefore, it is essential to recognize the importance of social interactions for human development. In addition, collaboration and integration with peers play a crucial role in education, encouraging the development of social and emotional skills and considering the student's history, current demands and perspectives (future).

For Tavares (2016, p. 20):

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> With meaningful learning, for example, the student is stimulated to manipulate the proposed contents, promoting interconnections between knowledge built by him, not being at the mercy of mechanical learning, repeating the guided procedures. In this way, it is necessary to develop the investigative instinct, encouraging the student not to be complacent, but to be an active participant in his learning construct.

Therefore, the studies defended throughout the work, especially the theory of child development, emphasize the importance of affectivity in the teaching-learning process. Henry Wallon, believed that affectivity is a fundamental part of cognitive development and that emotions and feelings play an important role in how people learn.

CONCLUSION

The research was carried out with data collection through challenging activities, application of SAEPE, and analysis of parallel results, including the interpretation and the way of the approach in solving problems 30 calendar days before it happened. We found that there are significant ways to make mathematics lighter and learning more efficient, such as using the students' daily lives by involving the contents and making comparisons of measures of the school routine.

When a student recognizes, understands and understands the context of the content, he mitigates his difficulties, becoming a protagonist agent in building interpersonal relationships that facilitate the dynamics that affectivity provides in the connection with problem solving in mathematics.

The emotions that the students showed were: willingness, satisfaction and pleasure in taking the SAEPE 2024 test. It was notorious to understand the importance of using a cohesive discourse in solving the mathematical problems presented, with the practice of movements studied and repeated in the intensive we performed, highlighting memorization, welcoming, affectivity and thinking.

From an organizational point of view, in mathematical teaching, we observe that understanding will only be attainable when everyone feels like a participant in the teaching-learning process and from the moment everyone understands their needs, difficulties and limitations in solving problems. Without dialogue, in affectivity and problem solving, we find several obstacles.

Wallon (2016) already legitimized this concept, by defending affectivity as an essential component of human development, acting absolutely on the motivation and

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engagement of students, significantly influencing their learning, that is, it is one of the fundamental bases of said development, alongside movement and perceptual cognition.

Affectivity, when combined with problem-solving, not only facilitates the learning of mathematical concepts but also fosters a more productive and inclusive classroom environment where students feel motivated and confident to learn.

The teacher's mediation in this process is revealed by his willingness to offer a diversity of situations, as well as space, so that all students can participate equally. In addition to being willing to answer the constant questions of students in search of getting to know the outside world.

Consequently, to achieve a significant change in the teaching of mathematics, there must be availability on the part of the teacher and the student to systematize the shared knowledge. Furthermore, continuous investment in teacher training, appropriate infrastructure and educational public policies that stimulate innovation in the teaching-learning process is necessary. Only in this way will it be possible to overcome the current resistances and obstacles in the educational system for high school, especially in the municipality of the state of Pernambuco surveyed, ensuring that all students have access to a quality mathematics education, which prepares them not only for academic challenges, but also for collective existence.

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