

Pedagogical Affection in Didactics of Mathematics - Amazonas Region from the Phenomenology Perspective


El afecto pedagógico en la didáctica de la matemática - Región Amazonas desde la mirada fenomenológica

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Summary

This research work analyzed the experiences lived in the didactics of the mathematics by the teachers in the Amazonas region, whose emergent significance was the pedagogical affection in teaching understood as a process whereby two or more people interact socially, one of the passions of the mood. The study was conducted using the process of the hermeneutic phenomenological method with a criterion sample of five teachers of the area; the techniques used are close observation and conversational interview. Also, the instrument to collect the testimonies of each teacher and reflect about them was the anecdote. Thematic units emerged from them such as concern, confidence, humility, hope, empathy, among others, and the affection as a general meaning. From the experiences lived by the teachers, the affectivity emerges in the teaching of mathematics, which leads to good personal relationships, gives hope, color and sense to learning, acts and the student's life.

Keywords: Affection, didactics of mathematics, subjectivity, phenomenology

Resumen

La presente investigación tuvo como propósito analizar las experiencias vividas en la didáctica de la matemática de los docentes de la región Amazonas, cuyo significado emergente fue el afecto pedagógico en la enseñanza entendida como un proceso por el cual dos o más personas realizan una interacción social, una de las pasiones que el ánimo presenta. El estudio fue realizado con los procesos del método fenomenológico hermenéutico, con una muestra por criterio de cinco docentes del área; las técnicas utilizadas son observación de cerca y entrevista conversacional. El instrumento para recoger los testimonios de cada docente y reflexionar fue la anécdota. De ellas emergieron unidades temáticas como la preocupación, la confianza, la humildad, la esperanza, la empatía, entre otras, y como significado general el afecto. De las experiencias vividas por los docentes emerge la afectividad

en la enseñanza de la matemática, la que conduce a buenas relaciones personales, brinda esperanza, color y sentido a los aprendizajes, a los actos y a la vida misma del estudiante.

Palabras clave: Afecto, didáctica de la matemática, subjetividad, fenomenología.

Introduction

Nowadays, most teachers of the education system who teach mathematics consider teaching only as an art resulting from personal abilities that cannot be learnt and transmitted and that favors the cognitive aspect, and ignores the existence of a research work on teaching or it is considered not useful. (Calvo, 2008) says that for mathematics, “mathematics is taught through decontextualized algorithmic procedures, without taking into account its application in daily life, and through formulas learnt by heart” (Mato, Espiñeira, López, 2017, p. 92). In addition, “the school mathematics is understood as a heap of abstract objects or definitions, which are therefore, prior to social praxis and consequently, not related to the individual, in which the teacher communicates or reproduces in the best possible way what is stated in the curriculum, in several occasions, without meaning for the students and the teacher.” (Reyes, 2016, p. 42) In this regard, it is necessary to know and reflect about the experiences of the teachers with satisfactory results in math teaching. To do that, it is necessary to know the education perspective.

Among the several perspectives conceptualizing education, this research work is focused on the set of external influences generating the development of competences, abilities and potential in an individual, that is, the one that considers education as an integral phenomenon focused on the individual and social aspect. Castillejo (1994) strengthens this interactionist position about education as an interactive process for the development of the individual (*educere* and *educare*).

Pedagogy reflects about education, from the concern of the subject and the congener, about teaching, learning and school. Zambrano (2006) concludes that the pedagogy, according to Meirieu, is a philosophy without school, for that reason, it is aimed at the social bond built from the sociology, which has a scientific character for learning as a result of teaching knowledge. Basic education in our country, regulated and oriented in the 2005 National

Curricular Design (NCD) is based on a curriculum with a humanist and intercultural educational approach, which considers the person as a core of attention for their cognitive, sociocultural and affective development. Another characteristic is to consider as one of its principle the integrality of learning focused on the body development and physical and mental health conservation, which means that students develop positive attitudes through activities that help with the integral and healthy development, physical and mental, an especially socioemotional.

The didactics of mathematics is based on a young knowledge discipline, the responsibility for reflecting the foregoing. Since it studies the didactic phenomena related to the mathematics knowledge, it is important in the different education systems worldwide, as shown in the study conducted by Gómez (2016) in Mexico, and involves the whole education community of the levels and modalities integrating these systems. In the last forty years, didactics of mathematics has been significantly developed and has become a very important topic for research in the education field. It has motivated the design and application of Peruvian educational policies established in the National Curricular Design (NCD) (2015), which is aimed at the improvement of mathematics abilities and achievement of results in students, with the teacher as a mediator.

The teacher has a special role in the didactics of mathematics, since they must organize learning individually or in groups. In addition, dedication, responsibility and attitude have a great influence so that the results and achievements of students are optimal. This willing and motivation towards didactics of mathematics is determined by the ability, experience, concepts, ideas and affectivity the teacher has with respect to this process. For that reason, knowing and understanding the vision of didactics of mathematics is a relevant factor when analyzing many variables involved in it.

The main purpose of this research is to achieve a phenomenological approach aimed at the study of meanings of experiences with respect to the affection in didactics the mathematics teachers have. Didactics of mathematics

has many definitions, but its main characteristic is its complexity. The specific purpose in this research is to study the aspects that determine the teaching and learning process of the area, as well as the development of programs aimed at the improvement of these processes. Steiner (1984) says that it is indispensable for the Mathematics Education Theory, the development of a comprehensive approach to mathematics education, which must be seen as an interactive system comprising research, development and practice. The teacher is the one who plays an important role and the main figure in this process, since it depends on their commitment, interest and especially on their personal and professional abilities. In addition, regarding affection in didactics for their students, teachers must answer the following question: How to teach mathematics better? Showing the importance of the experience in the process the teacher has.

The teacher is an essential element in the process of transforming knowledge into expertise and plays also a main role since they transmit directly the contents, principles and values that are the basis of education. It is indispensable that teachers are aware of the management of emotions, mainly in their daily relationship with students. Therefore, we must put in practice self-motivation strategies, control of moods, to show empathy and ability to listen and to manage conflicts arising in the classroom with assertiveness. (Fuster and Altamarino, p.261) Besides, Kincheloe (2001) says that the significant role played by the teacher depends on the achievement of objectives set (p.16), since it is subjected to their responsibility, knowledge, willingness and attitude when applying their didactics in the mathematics teaching process. D' Amore (2005), taking into account the didactics of mathematics and the teachers' role, he says that, since the beginning of the study of didactics of such area, the teacher was considered an artisan (the teacher prepares and chooses the lessons, the forms, examples...) and as an artist (the teacher chooses communicative variables, modalities to capture attention, to motivate...) (p.11). Besides, D' Amore (2005) says: "Didactics of Mathematics as an art is closely related to the mathematics

teaching activity and the main objective is to create situations (in the form of classes, activities, objects, environments, games...) for a better mathematics teaching.” (p.11) In this regard, it is understood that if teaching is improved, learning is improved as well, so the whole comprehensive teaching-learning process is entrusted to teachers, who should attract attention and motivation of the student so they learn.

Ayala (2011), in his article about pedagogical hope, says:

Experience is everything the teacher has gone through in terms of didactic teaching-learning strategies, which have been experienced as a whole, as a unit that will have elements established due to the systematic reflection process that will allow showing, understanding and describing it, since it aspires to the apprehension of essential meanings of the human phenomenon and formulates detailed descriptions in order to enable the phatic and cognitive evocation of the essential meaning of the phenomenon; they will be collected as a phenomenological text that seeks to transfer the reflective awareness, the nature of events experienced in the world of life in order to achieve the transformation in the deep sense of *Bildung* (cultivate oneself) (p.120).

Affection

The word *affection* comes from the Latin word *affectus* and it is considered as one of the passions of the spirit. It is the inclination on something or someone, especially in affection or love. Affection is a process whereby two or more people interact socially. Álvarez, Becerra and Meneses (2004) state that giving affect is doing selfless work for the benefit of others, it is also something that is transferred, that is, something that can be given or received. Affection can be usually identified with emotion. However, they are two different phenomena, although they are much related. While emotion is the personal response from the inside that communicates the probabilities to overcome a certain situation, affection refers to the process where two

or more individuals interact socially. That is, it is something that emanates and transposes from subject to another. Moreover, it is easy to infer that giving affection to someone involves an effort, for example, helping, taking care, understand, etc., that is, it necessarily requires to make a greater or less effort. González, Barrull, Pons and Marteles (1998) say that giving affection requires to make an effort. Just as caring for a child, caring for an afflicted person requires effort, supporting a student needs effort: as long as it is, affection is given.

Affective Bond from Psychology

For psychology, the affection is a basic and very important need. Since without affective-emotional development, the human being would have an incomplete and poor development, from conception, parents intuitively stimulate their future babies and loos after them in the social, physical and intellectual aspect. Bisquerra (2008) says that the affection is a human ability that allows the exchange of feelings with other people. Emotions procure and keep these bonds and they are stimulated according to the absence or presence of the congener, who can be available or not. In addition, Horno (2007) says that, during the emotional development of a child, it is necessary that children capture emotional bonds with several people, so that they can build the comprehensive formation, in which these people teach different ways of relationships and can perform a substitute task in circumstances in which a person whom the child loves is not present. The development of a child will be better when their pyramid is broader. This is where it is necessary the support of the psychosocial network and the satisfaction of their needs by the people around them (friends, classmates, parents, grandparents, among others), thus favoring their evolutionary development and especially, all the emotional part. Therefore, different emotional relationships, either with minors or adults, must be promoted in children.

In addition, Bisquerra (2008) says that the affectional bond must not be exaggerated, since it will provoke an emotional dependency. On the

contrary, an emotional disconnection can cause problems, since it leads to the inability to establish emotional relationships with the congeners. That is, both extremes, dependency and emotional disconnection complicate interpersonal relationships. The work lies in reaching an adequate affectional bond and the fact that this bond is kept, ensuring the emotional autonomy.

Affection and Society

Since man is an eminently social being, it can be inferred that he will not be able to live in solitude, that is, without direct or indirect collaboration of other human beings. This is evident since birth, since he vitally needs the collaboration of his peers or congeners. Human beings structure their life according to relationships, experiences and argumentations focused on interaction with society. Aulagnier (1984) mentions that the subject is established in the reality, what surrounds them is an important part of their self-control, everything they hear, feel and see is of great importance to build their reality and their life (story), but it will be also important that it be built by the eyes of other people around them. Evidently, this social dependency is good for man, since due to that collaboration he receives and provides, the group is consolidated with greater emphasis and the individual increases their chances of living more and reproducing. That is why when you hear that man needs affection to be always good, actually, it means that he needs support, cooperation or help of other people to be able to survive. Consequently, when social help is needed, it is understood as if affection were needed or as if an emotional need would be felt. For that reason, affection is considered important and essential in the development of life of any human being. In this regard, giving affection is just to help the other, seeking their well-being and survival. That is affection, expressed as cooperation for survival.

To achieve the comprehensive development of the students, it is necessary to promote the development of the different aspects: emotional, cognitive and social. Emotional education must be present in the school during the educational process of the students, as a continuous and permanent process

that allows the formation of more free people able to communicate their needs accurately, to ask for help, manage anxiety, play an active role and control their language or even, adjust the way of relationship and to coexist with their classmates according to the regulations, that is, they turn into basic skills to be developed. Fernández (2011) emphasizes the development of emotional intelligence, of the skills a person has to relate effectively to themselves, to their family, classmates and other people of their environment; he considers that the foregoing is important for any kid (p. 133). Fuster and Altamirano (2017). The emotional competences of a student is the best measure to prevent the risk of social vulnerability, since they provide tools that allow facing conflict situations. (p. 260)

Affection leads to Teaching Satisfaction

Satisfaction is shown in the pedagogical work, in any education actors, expressed as positive or comfort feelings they have when performing an activity of their interest and especially in a well-organized environment, where they are happy and they can be compensated in psychological, social or economic terms for the achievements and results obtained and that are perceived and experienced positively. According to Robbins (1996), the satisfaction of the position performed is the general attitude a person has towards their job. If this person has an outstanding level of satisfaction at work, they will express positive attitudes towards themselves. However, a person will have negative attitudes if they are not satisfied with their position. (p. 181).

Didactics of Mathematics

There are several definitions referring to didactics of mathematics, especially nowadays that it is a discipline that belongs to the didactic research category and it has more than 4 decades of emergency. The first concept proposed by Brousseau, which serves as a basis for other developments, was called

Theory of Situations. It was proposed at the beginning of the 70's and then it was concertized when his thesis was published and, later, it was enriched by the contributions provided by Chevallard (1990) about institutions and relationships with knowledge and know-how. From there, Brousseau determines that didactics of mathematics is in charge of the study of teaching activities, that is, those activities aimed at teaching, especially those subjects that have mathematics as special content.

Also Chevallard (1989) addresses it from an anthropological perspective, that is, from the study of the individual, human societies, according to teaching and learning of mathematics. He says that didactics of mathematics is aimed at the study of several types of teaching systems, which are structured by subsystems that are students, teachers and knowledge taught, and they exist or can be created somehow, that is, grouping and systematizing an outstanding type of teaching.

Brousseau (1999) accepts the didactics of mathematics as the art of teaching, and states that it is a set of procedures and means aimed at transmitting knowledge of mathematics. Based on the two scientific concepts called autonomous conception and applied multidisciplinary conception, Godino (1991) proposes the union of the two conceptions: the former is a technical term, known as teaching techniques, such as invention, description, study, production; and the latter, control of new means for teaching: curriculum, objectives, means, evaluation, materials, manuals, works for training, etc. A quality education seeks that the student acquires knowledge in a dynamic way, that is, through teaching and methodological strategies that allow them to discover, appropriate new knowledge, build their own knowledge.

Affection in Didactics of Mathematics

Frequently, expressions like “I receive a lot of affection”, “They give me love”, “I give too much affection” and others are usually heard and actually, they refer to a transmission process that allow understanding the affection as

a mechanism that will occur in the social interaction between two or more individual or organisms. In this regard, the affection can provide or receive from others, and the pedagogy as a practice is not alien to it, since situations, where there are displays of affection, are experienced in the teaching activity.

Manem (1998) says that, just like parents, teachers develop a deep and huge affection for their students, they consider themselves to be responsible for the students in their care and have hopes for the sake of their young people (p. 23). Working on the affection means to be in a good mood about what we are thinking and also about our perceptions, for example, the fact of being well emotionally allows you to see that everything is in your favor and there is happiness around you, and this does not happen if your emotional state is the opposite. Besides, the research carried out by Delgado, Espinoza and Fonseca (2017) confirm the importance of the emotional component in successful learning of students in the field of mathematics. The above-mentioned authors support the purpose of the study focused on the analysis of experiences lived by the teachers, which was reflected as an affection in the teaching of the didactics of mathematics.

Materials and Methods

The research work was developed within an interpretative paradigm defined by Bodgan and Taylor (1986) as one that seeks to understand the social phenomena from the perspective of the actor himself, taking into account the subjectivity assumed as the process whereby one learns through psychic externalizations. The study was carried out using the qualitative approach that according to Fernández (2014), it is focused on understanding the phenomena, which are explored in a natural environment and from the perspective of the subject in relation to the context. This approach was assumed, since it considers the life itself as a social whole that can be observed and analyzed by using in the process the personal experience as an important element that allows the researcher to approach a social context. The phases of the hermeneutic phenomenological method that involves apprehending

the essence of the meaning of affection in the didactics of mathematics were rigorously followed; meaning based on the opinions and experiences of the teachers supported by Manen (2003).

The population of this research is all the teachers of the mathematics area who works in high school institutions of the Amazonas region. The sample was chosen by using a non-probability sampling technique based on criteria. According to Hernández (2014), elements are selected according to reasons related to characteristics required for research. A homogenous sample was chosen since the units selected have a common profile or characteristic and the sample is a convenience sample because it is based on availability, and it is made up of 5 teachers of the area of mathematics from education institutions in the Amazonas region.

The following techniques were used: close observation and conversational interview to collect anecdotes of experiences lived by the teachers of the research sample. The instrument that provides the research data sources is the anecdote or story, that according to Manem (2003), it is a traditional rhetorical instrument used by the phenomenological writing, in which the story is described in narrative form. Regarding the validity of the qualitative instrument, he tries to capture the reality as perceived by the subjects. According to Lincoln and Guba (1985) “reality is a set of mental constructions of human beings.” In this context, the validity of a qualitative research is focused on the adequate representations of mental constructions that individuals under research offer to the researcher, that is, the closest meanings to reality.

The methods and procedures used were empirical and reflective that will be described below. Regarding empirical methods, Manem (2003) states that these methods are aimed at collecting material with respect to the experience lived by the subject and the researcher develops their interest in the foregoing, especially in terms of description. The empirical methods used in this study are the conversational interview and the close observation, whose fundamental characteristic lies in knowing what the nature of the experiences lived is,

with respect to the affection in the math teachers' didactics. The reflective methods, according to Manem (2003), are those aimed at determining and analyzing how the essences of the experiences collected from the samples are structured. The reflective methods used in the research are the thematic analyses that allowed the extraction or recovery of essential topics expressed in the experiences lived. The thematic reflection allowed finding the deepest meanings of notion of different topics and especially of the affection. Linguistic reflection was used to collect topics that were appearing in several phenomenologically addressed paragraphs (study of etymology and daily linguistic expressions) and, finally, the conversation reflection that allowed exploring and understanding the sample.

The procedures for data analysis do not correspond to statistics, since the research is qualitative. The information analysis was performed in four stages of the phenomenological hermeneutic method. For the first stage, the proposal made by Martínez (2008) was adopted. Moreover, from the second to the fourth stage, the proposal made by Ayala (2008), who is based on Manen (2003), was assumed.

The previous stage or budget clarification, process called *epoche* by Husserl (1992, p.70) is the stage in which existing budgets are reduced to the minimum possible, in such a way that this does not distort the true course of our research on how the affection occur in the didactics of mathematic, being aware of what could not be eliminated in the research. In addition, some values, beliefs, attitudes, premonitions, conjectures, interests and hypotheses present in the research process were removed so they cannot influence, thus meeting the conditions of the phenomenology that states that a true philosophical and scientific research can be executed only if any prejudgments can be removed before.

In the stage of collecting experience lived (description), the experience was collected directly through sources such as stories about the experiences the mathematics teachers had, conversational interviews with each one of the members of the sample, and an autobiography, all of them about the

experience of affection in the didactics of mathematics. Then, each one of the experiences was transcribed, always paying attention to the considerations of the previous stage. Besides, the anecdote was expanded through conversational interview aimed at affirming the accuracy of the experience and at the same time, deepening it, especially with topics of interest of the research, to then rewrite and integrate the important topics, trying to keep the accuracy at all times.

The stage of reflecting about the experience lived (interpretation) was focused on experiences obtained for their respective interpretation. To do that, first the thematic analysis was carried out in two stages: macro-thematic reflection that allowed the detection of the judgmental phrase that expresses the meaning with a holistic approach of a whole text, and the micro-thematic reflection refers to the detailed approach by paragraphs, whose phrases express a set of essential meanings of the anecdote. Second, the writing of linguistic transformation could be confirmed, that is, according to the phenomenology, organizing the topics obtained from more specific paragraphs. And, finally, the heuristic reduction was performed detecting prejudgments, budgets and personal ideas with no foundation and that could be present.

In the stage of writing and reflecting about the experience lived (description-interpretation), the research findings were considered in order to write the final phenomenological text in a descriptive way through the permanent reflection, which is the objective of the research, and the main topic is the affection in the didactics of mathematics that evokes actions, intentions, behaviors and experiences lived with respect to affection in the didactics of five mathematics teachers, and its results were shown in functional meanings. Besides, in the description, cognitive and non-cognitive (pathic) meanings are expressed. Finally, in this process the work results were compared with the qualitative studies related to affection.

Results

Affection in Didactics of Mathematics

Worrying about and understanding the students' problems is a way to give affection that requires effort. Although in many circumstances, the teachers feel frustration, the study performed by Lezama (2016) states that despite teachers have a proactive attitude, they experience a great frustration when seeing that the results of their actions do not show the expected results (p.97). The illusion to improve the situation of the student does not make the affection evident. However, the affection given by the teacher is essential for the student, since it awakens emotions, feelings and/or passions that will determine their education.

Concern as an element of affection determines the problems and/or threatens occurring in the mathematics teaching-learning process. The teacher diagnoses, researches and understands the problems the students have since they enter the class. According to the results, they schedule additional hours for reinforcement of low-income students in order to improve their emotional and cognitive situation.

Affection in the pedagogical work is focused not only on the cognitive aspect of the students, but on the emotional and affective aspect of them, going beyond learning of knowledge. Important abilities like sensitivity (or aesthetic ability), imagination (or creativity and inventiveness ability) affectivity (or ability of insides, tenderness and love) and the ability of transcendence or divinity (Remolina, 1998, p. 72).

Affection and care propose to solve the problems of students. However, in this process new problems arise or are generated, so the teacher shows their experience, reputation and knowledge. The teacher is worry about the reaction of the rest of students, about the strategy used with the classmate who needs help. The teacher also seeks the integration to improve the attitude towards mathematics with techniques that allow socializing and helping each

other, the teacher always cares. Regarding this topic, Gómez (2002) says that the teacher's lack of concern about their students leads to school failure. In this regard, it is stated that the teacher's care about the conditions of their students leads to prevent difficulties and the success of their learning. Also Schön (1992) says that the teacher's increasing care about improving their knowledge allows them to stand out in their profession and to occupy an outstanding place in society (p. 20).

The affectivity requires effort and this is shown by the teachers in mathematics teaching, for example, they have patience to make friends and teach their students, which demands time, dedication and good mood. They also get to know the characteristics of each student to teach them according to it. The effort made to give affection develops abilities in students. This implies time and extracurricular activities in order to consolidate friendship, confidence and strengthen knowledge. To do that, the teacher needs the student's predisposition, so that the emotional and cognitive aspect could be improved.

The affection of the teacher is important in the education process, since it is demonstrated that students learn better mathematics with those teachers with whom they feel comfortable and who not only show intellectual ability, but emotional intelligence. Thus, these teachers allow a direct treatment based on confidence and friendship, which must be cultivated by the student as well, taking into account that the effort required by the affection causes the teacher to develop what is called pedagogy of love. And to do it, the teacher invests time in attention and mathematics teaching based on love and empathy.

The affectivity is a component that plays an important role in the teaching-learning process, and is not the opposite of the cognitive aspect. If both join together, stronger foundations can be built, especially in the mathematics education process, every time they are taken into account together. The teacher who assumes these dimensions within the didactics of mathematics will surely achieve better results in their work, since they are

creating a confidence and affectivity environment to overcome the problems resulting from negative emotions and also, create and allow the use of positive emotions that facilitate the student's learning. The research done by Pérez (2013) states that the affective variables such as mathematics anxiety and self-confidence have a great influence on the academic life of students. In this regard, it is concluded that the affectivity in mathematics teaching allows the student to learn mathematics with confidence and pleasure. Regarding this, Gómez (2000) states that there are increasingly evidences of the ways in which cognitive functions interact with emotional states.

Satisfaction occurs in the pedagogical work of the teacher and it is expressed like positive and pleasure feelings that they experience when performing an activity of their interest and especially, in a well-organized environment, where they feel happy and they are compensated psychologically, socially and/or economically for the achievements and results obtained and that are perceived and experienced positively. The teacher, who is happy with the quality of the work performed, will feel satisfaction, and even more if their work is recognized, they will work better and enjoy what they do. This gratifying experience will involve emotion and affection towards their students. This is supported by Padrón (1995) who says that satisfaction of a person at personal and professional level has a close relationship with mental health and also with personal balance (p. 4). Therefore, in case of teachers, satisfaction is closely related to teaching activities and to the characteristics of their personality, since this will influence their emotional stability and can produce different types of emotions as the case may be, for example, tension and stress, which will provoke discomfort in the personal and professional aspect or can produce the opposite as well.

Affection leads to satisfaction and is expressed in happiness for the achievements obtained, which promotes the teacher to continue participating in the different events and competitions. Veenhoven (2005) says that "happiness is the evaluation of the degree of their life quality as a whole. In other words, when people are pleased with the lives they lead." Moreover,

Hernández (2002) says that happiness “is a subjective evaluation of the emotional state of the person in interrelation with their environment in a prolonged time. All of this in relation to satisfaction during human existence.”

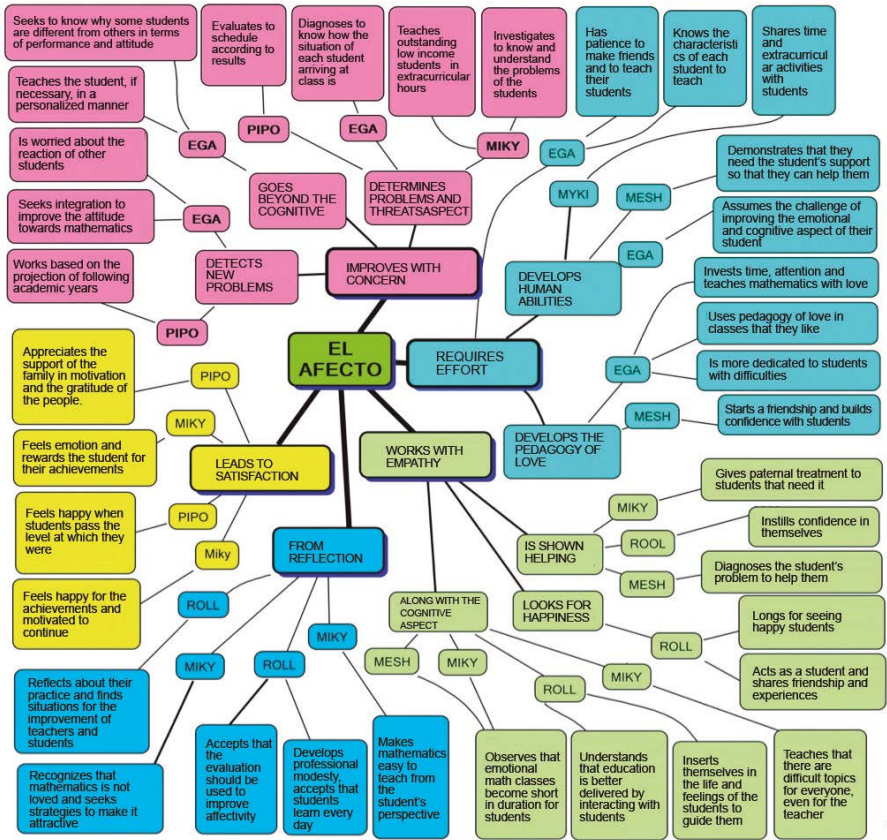


Figure 1. Group Physiognomy Organizer

Discussion

Based on the research, the affection and empathy allow enjoying learning with confidence and participation, overcoming learning difficulties or problems of students. Regarding this, Damián & Villarroel (2010) say that the quality of interpersonal relationships, academic performance and teacher performance depend on the level of emotional intelligence. Reinforcing this assertion,

Maturana and Bloch (1996) say that emotions are the foundation of each one of our acts, among them are reasoning. Consequently, affectivity in the teaching processes becomes important as well as the emotional intelligence, neither on paper, nor in written lines, but in practice. The research collects hidden experiences, experiences not narrated, for many people, not important. The study allows rediscovering, reflecting and valuing the teacher who shows affection in the teaching of mathematics.

This research work establishes that the affection in the teaching of mathematics based on love, confidence and hope lead to overcome weaknesses and threatens in students. In allusion to it, Oliveros (2004) concludes that the bond between teacher and students is also experiences and actions of affection, integration into color and sense, acts and life. Therefore, the presence of affection in the mathematics teacher's work will give hope, color and sense to learning, acts and the life of the students. Tirapu, Landa and Lorea (2004) consider that teacher's attitudes depend, to an equal or more extent, on the emotional situation that they have in a certain time rather than on the intellectual reasoning attitudes. For some teachers, whose idea is "mathematics is only cognitive", the research work will be contradictory, since it shows that teaching mathematics, although its limitations and adversities arising, goes beyond the cognitive aspect. This is a wake-up call for teachers: to teach mathematics, you need love, confidence, hope and much effort in the affection of the teacher.

Conclusions

Conclusions are reached from the discussion of the results and are focused on the experiences of the teachers:

Affectivity in the teaching of mathematics allows the student to learn with pleasure. The teachers who express positive affectivity will have good personal relationships, better academic performance and their performance will be optimal in learning improvement of their students. Besides, the

affection in the math teacher's work will give hope, color and sense to learning, acts and the life of the students.

The teachers' concern about the conditions of their students prevents their difficulties and allows the success of their learning. Concern about the affection determines the problems and/or threatens present in the mathematics teaching-learning process.

Since the mathematics teacher is concern about the affection, they go beyond the cognitive aspect and to that end, they seek to know why some students are different from the rest in terms of performance and attitudes, and once the causes are determined, if necessary, they give the student a personalized assistance.

Concern about the affection allows the detection of new problems to solve in the way. In addition, the work is foreseen to solve academic difficulties that can arise in the following academic years.

Affectivity requires effort and this is shown by teachers in the teaching of mathematics. For example, they have patience to provide friendship and teach their students, which demands time, dedication and good mood. They also know the characteristics of each student to teach them based on this.

The effort that requires affection causes the teacher to develop what is called the pedagogy of love. To achieve it, the teacher invests time in assistance and teaching of mathematics based on love, cultivating friendship, confidence and empathy, and they are more focused on students with difficulties.

The affection and empathy are intimately developed and are related to cognition, since if the feelings they have are not related to intellectual knowledge, what a student learns will not lead them to action. The mathematics teacher is aware of it and to achieve it, they put themselves in the life and feelings of students to guide them, since they understand that education is better delivered through the interaction with students and explain their students that there are difficult topics for everyone, even for

the teacher, but they will be overcome, so they can see that affection based mathematics classes become short in duration for student, who want to even have more hours of classes.

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