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Emotional intelligence in the initial teacher training

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Abstract. The objective of the article is to evaluate emotional intelligence in the initial teacher training of the mathematics bachelor program at the “Universidad Francisco de Paula Santander”, San José de Cúcuta, Colombia. The methodology is framed in the qualitative approach with some complementary aspects of the quantitative approach, the applied technique is the interview and the trait meta-mood scale instrument. The results describe that the impacts of integrating the emotive dimension in the learning strategies of mathematics is a greater resilience in the teachers in formation, since thanks to the contact with their emotions through introspection and reflection they manage to draw plans and alternatives that help them to devote more time, ask more and study better, especially in those aspects that cause them difficulty.

1. Introduction

The learning of mathematics is a highly problematized area by the academic difficulties it can generate in teachers and students. There are evident negative attitudes towards their learning, and sometimes a total rejection of this subject, causing a low academic level [1], which confronts teachers and students at a crossroads that also extends towards the perception of the quality of the teaching process.

In this sense, it is necessary to specify the concept of emotional intelligence (EI) as: A psychological construct conceptualized in the field of emotions and it refers to the right interaction between emotion and cognition, which allows the individual, a functioning adapted to its environment [2].

EI was an unknown concept until the 1980 decade when Gardner, in his work "structures of the mind", affirmed for the first time that there is not only one intelligence, but that, depending on the human being, this one has several intelligences [3].

Recent development of this concept has implied a slow participation in other areas of knowledge and development, such as occupational, educational or economic. The designation of emotional intelligence was adopted by the psychologists [4], to spread worldwide by Goleman, who defines it as "the capacity to feel, understand, control and modify our own and other people's moods" [5].

Although the Goleman model is the most known, it is not directly related to the educational scenario but to the professional performance. A more appropriate option is the Salovey and Mayer model: known as trait meta-mood scale (TMMS-24), which evaluates the beliefs that people have about their own capacity of attention, clarity and repair of emotional states [6]. It consists of 48 items in its longest version, with three subscales: attention to feelings, 21 items; clarity in feelings, 15 items, and emotional regulation, 12 items [3].

For this proposal, have been considered the Salovey and Mayer EI definition [5] "is an ability centered in the processing of emotional information that unifies emotions and reasoning, allowing us our emotions to facilitate a more effective reasoning and think more intelligently about our emotional life" [7].



2. Method

It was chosen a qualitative, inductive and flexible approach that allows "studying reality in its natural context and interpreting phenomena according to the people involved" [8], complemented with the principles of the quantitative approach to establish and analyze the score of instrument scale that involves four main stages: operational design, data collection, data analysis, interpretation of the results obtained [9].

The population universe of the present investigation was integrated by the students of degree in mathematics program of the "Universidad Francisco de Paula Santander (UFPS)" in San José de Cúcuta, Colombia. The sample or the informative units of the study were selected according to the non-probabilistic sampling technique, approximately 13 teachers in training per semester, and 130 project informants.

The instruments defined are the survey and the interview. In the case of the survey, the TMMS-24 instrument was chosen, this adaptation to Spanish by Fernández-Berrocal, Extremera and Ramos [7] consists of 24 items in self-report mode, distributed in three key dimensions: emotional perception, comprehension and regulation of feelings. For the interview, the design of a semi-structured questionnaire is proposed by a script of 16 open questions aimed at deepening the role that teachers in training assign to emotions within the learning process.

In this case, the interpretation of the quantitative results obtained by the application of the TMMS-24 test will be analyzed with the scale of evaluation of the instrument for each one of the factors: attention, clarity and emotional repair. The qualitative results of the interview were analyzed from the perspective of content analysis, a technique defined by Ocampo [10].

At the end, triangulations were set for each category of the study: emotional intelligence, initial teacher training, teaching and learning to contrast the approaches allowed by the test and the interview to boost personal and theoretical discussion of the results achieved [11].

3. Results

The general results of the univariate analysis are presented in Table 1, which shows that there is a normal trend in the scores obtained in the different factors evaluated, which are in the category of adequate perception, compression and emotional regulation.

Table 1. Measures Statistics of the instrument TMMS24.

Statistics	Perception factor	Comprehension factor	Regulation factor
Mean	28.0	29.4	29.0
Standard deviation	6.42	6.59	6.27
Asymmetry	0.23	0.24	0.17

The scores of the instrument are differentiated by gender, in the case of women, the perception factor is low when it is <24, adequate between 25 and 35, too much when it is >36, in men little is <21, adequate between 22-32 and too much >33.

In the comprehension factor, the score for women is low when it is <23, adequate between 24-34 and excellent when it is >35, in relation to men it is low when it is <25, adequate between 26-35 and excellent >36.

In the regulation of emotions, qualification levels for women are low <23, adequate 24-34 and excellent >35, as for men it is low when it is <23, adequate 24-35 and excellent >36.

Table 2. Distribution of scores by gender and factor.

Gender	Perception factor score	Comprehension factor score	Regulation factor score
Women	28	28	30
Men	30	34	31

Table 2 regain that in both male and female student's respondents reflect an adequate level for the three factors: emotional perception, comprehension and regulation of emotions

In the interviews, referring to the category of emotional intelligence, most of them doubted how to respond, in this sense the E01 pointed out: "Emotion awakens me joy, curiosity sometimes fear, sometimes intrigue, I chose the process as a challenge for me. I feel not happy about have been studied calculus IV, I feel happy about I have learned it".

Not all the respondents are expressive when describing their emotional register, in the case of E03, "mathematical training gives me happiness, because you have a vocation with the best attitude", although her vision is positive is focused only on her formative experience.

There is also those who consider emotions an obstacle or distraction for the fulfillment of their tasks, as highlighted in E02, "I try to hide my feelings from my students because sometimes they can notice it, and in that case, it is better don't consider them". Some of them think that emotions define them and that their emotional responses must mature, E05 considers, "emotions are related with personality, when you are a teacher you must change your personality and be a role model for others".

Asking about how they react to the problems or failures that are presented to them in the academic field, they shared that "when I lose something I feel fear and sadness" (E01) meanwhile E02 states that he focuses on "I try to understand why I failed?"

One of the main concerns by the interviewed teachers is their ability to mediate in the conflicts, for example, E04 states that: "when there is a conflict, it is essential to know where I am, take time to breathe, take distance and then I can answer them".

The students show that they see in emotional intelligence a strategic response that can be used in their favor, E01 remark that: "the teachers have always indicated that self-control and temperance are very important".

Teachers in training follow discovering the nuances of new professional responsibilities that involves different elements to face the challenges of today's society.

In that order of ideas, the E03 indicates that: "you can have an amazing curriculum vitae, but there are situations that you have never faced, they damage you and you don't know how to do it". The extreme scenarios exposed by the students include the abuses and violence suffered during their childhood. Some concerns are "try don't confuse the roles between the teacher and the student's buddy" (E04) and "to be strong emotionally because it faces many things"(E05).

Asking about how consolidate their training process they commented "It is very important the assertive communication" (E03) and E04 states that "I believe that emotions must be peaceful, if a person correct you, you have the right and duty to retract it".

You need to understand that you are facing a human being who can be wrong too, it is especially difficult when you have groups of 40 to 50 students, you can avoid being very rigid and create frustration in students (E04).

Finally, although they feel well prepared at the academic level, they still feel that they must work on their social relationships and interactions.

4. Discussion

Emotional intelligence is not only about people know or don't know how to regulate their emotions, since it also involves how they perceive them, if they recognize, assimilate and understand them or if they are overcome by them. In the perspective of Salovey and Mayer [5] this construct is a set of skills that allow individual and collective reasoning regarding emotional perception and understanding.

The results of the TMMS-24 show that male students achieve higher scores in the three factors evaluated in perception, comprehension and regulation while the surveyed women are also located in a range of normality. The best positioned factor is the emotional regulation that is traduced in an optimistic point of view when they feel sad and the capacity to stay calm with good spirit and energy. The factor with most weaknesses is the perception, they show little concern for what they feel, there isn't time to thinking about emotions, their answers are generalized.

In the interviewed students exists a resistance to being in contact with the feelings and emotional responses generated by the situations they must deal daily [5].

Among these difficulties is the belief of need to change his personality to adjust to the demands of educational institutions or that their students have a double behavior between be machines or be spontaneous and overwhelmed with their feelings.

The insecurities expressed by teachers in the first semesters are focused on their expectations of what it will mean to teach classes to groups of children and teenagers. For the students of last semesters, who have already lived the experience of teaching math classes, their doubts are about how they can equilibrate their behaviors with the professional they wish to project. Opposite to Goleman's perspective, math teachers in training prioritize other values such as discipline, concentration and dedication [5].

4.1. Initial teacher training

The training of teachers is a fundamental process of little depth, it is thought that everything is designed and standardized, however, with the growing relevance of emotional intelligence it is necessary to transcend according to Dubois of technical and scientific knowledge towards development of personal and social being with the potential of each student, in primary, secondary or technical and university education [12].

The results of the applied instrument refer that the students of the bachelor of mathematics have a natural inclination towards the human aspects, interpersonal and intrapersonal of teaching-learning processes, to demonstrate an effort on their part to generate interactions and spaces of empathy.

In the interviews, the teachers in training give more importance to the communication, the emotions and the attitudes they choose to create environments that invite the construction of learning. They seek to support the integral development of future teachers because they are going to oversee the new generations in a society increasingly convulsed and demanding.

In the perspective of Díaz there are a series of general criteria that guide the experience of teacher training, in some the personal component predominates, in others the theoretical and disciplinary, in other ethics or religion, that can be resume in three essential components: cognitive, affective and of process [13]. In that sense, the E01 expresses that: "An emotion is fought with the reverse emotion, but the key word for a teacher is empathy, if you do not have empathy you have nothing".

4.2. Learning mathematics

In the analysis of the learning of mathematics two important features are identified, the first considers the role played by the relationship between the teacher and the student, the second refers to the ideas and beliefs that exist around the subject. Both aspects remain related because in the narrations of the teachers during the interviews it is evident that a negative, indifferent or too severe attitude can demotivate the student.

In the contributions of Alsina and Domingo it is recognized that learning does not occur only thanks to the internal elements that can be controlled in the classroom, but also involves external elements that have to do with the social context, family, cultural or economic of each student, which affect the clarity or difficulty of mental operations [14].

For its part, the E04 states that generally "You do not have to be afraid of mathematics itself because often the student is predisposed to the subject or the teacher" and that is why it is so important to direct attention to the intangible components that determine the success or the failure in the domain of mathematics, some of them are highlighted by the E05 "there is a very important point that is the academic, but there are situations in which the teacher must get out of this and share part of his life so that the student learn theory based on experience".

In contemporary conceptions, theoretical visions such as those of Blanco, and Guerrero predominate, which prioritize the role played by the affective domain in the learning process and in that case, consider the motivations, beliefs, preferences that are responsible of emotional responses [1].

4.3. Learning strategies

The strategies that students use unconsciously remain linked to their emotions. The main reason why they decide to stay in the undergraduate program in mathematics is the joy generated by continuing to learn and become teachers. Lopes and Salovey insist on the importance of reconciling in schools the dichotomy between head and heart, a contradiction that generally produce exhaustion in students [6].

In the E01 experience it is important to consider the achievements previously made, to analyze in depth the present matter and project future actions, meanwhile the E03 considers it necessary to reflect on the processes carried out to define the failures and opportunities, for its part the E05 seems important have a sincere dialogue with the teacher to know their difficulties and find ways to improve.

The learning strategies lead to reflection in the teachers in formation, in that sense the students are the ones who decide the ways in which they can learn with greater efficiency and they do it following their personality, some of them are disciplined, while others assimilate the contents only through what they live in class.

5. Conclusions

The main emotional characteristics that mediate in the learning of the mathematics of the teachers in initial formation are the empathy, the tension, the fear and the joy, they appear in pairs and take the student from one extreme emotion to the next. In that sense, they try to minimize what they consider negative and in the end, they try to be rewarded with those that qualify as positive, which is why they fail to describe the emotional responses that await them to analyze or solve an exercise, but if they can go deeper into those who experience when they make a mistake, lose an exam or do not know how to recover from a complicated situation.

In the present research, a normal and adequate level of emotional intelligence is identified, however, when going deeper we find that the first semester students are still discovering how to perceive, recognize and assimilate the changes, the new situations that university life brings, while that those of the final semesters focus on strengthening their personality for professional practice. Both have doubts and their knowledge about this construct could be better, because it would help them to develop their training process better.

The relationship that exists between emotional intelligence and the learning of mathematics exists, it is evident, and each time has greater recognition, since students identify that some intangible aspects such as communication and trust with the teacher in the classroom, mark a significant difference when approving or disapproving, enjoying or rejecting this subject.

The link between emotions and the willingness to learn in the UFPS program in mathematics is expressed in the students' concerns about strengthening their perception, comprehension and regulation skills in face of the challenge of having to orient their own classes before different groups of children or adolescents, to that extent they become more aware of the role they play and are more interested in deepening their ideas and feelings.

The impacts of integrating the emotive dimension in the learning strategies of mathematics constitute a greater resilience in the teachers in formation, since thanks to getting in touch with their emotions through introspection and reflection they manage to draw up plans and alternatives that they help to dedicate more time, ask more and study better, especially in those aspects that cause them difficulty.

The consequences of integrating the affective into the learning strategies of mathematics are reflected in the attitude of students.

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