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School success in mathematics and the impact on interpersonal relations

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School success in mathematics and the impact on interpersonal relations

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Abstract. Students who are excellent in their academic performance face challenges and difficulties associated with the social relationships they develop when living within the school environment. In similar studies, there are limitations such as the identification of the variables involved without reaching the level of correlation in the educational experience. The main objective of this research is to evaluate the impact of high academic performance on the interpersonal relationships of young adolescents in the I.E. College of the Sacred Heart of Jesus. The methodology used responds to the mixed approach, in the quantitative field follows a correlational method, from the qualitative field follows an ethnographic method, is designed for three phases and applies the instruments of the Davis empathy test (IRI), interview and non-participant observation. The results obtained show that there is a significant relationship between the academic success of the students and the quality of the relationships they have with their classmates, in general they tend to be less emotional and interested in cultivating significant bonds.

1. Introduction

School success can be associated with the personal, family, social and institutional variables that constitute a complex universe of difficult concretion in such a way that it is very difficult to address any of them in isolation, because any intervention in each one will affect in some way the others and therefore to its whole [1].

In that sense the Educational Institutions (IE) are spaces that encourage and witness the development by stages, which human beings experience from their childhood to adulthood, this is one of their main characteristics because they are involved in shaping, to a certain extent, the personality of the students, that is, their attitudes, behaviors and visions about life [2].

From the perspective of authors such as Hallinger and Heck [3], a deeper and more complete vision of the school is required as the stage where people acquire their guidelines on leadership and coexistence in a reciprocal way. In his vision, the same importance should be assigned to social skills as is usually done for traditional theoretical knowledge.

In the question of the impact of academic success in interpersonal relationships, reasons arise, such as the fact that there are young people in the I.E. Sacred Heart of Jesus behave and socialize to continue being considered the best of the class, while there are others who face difficulties to keep the rhythm, meanwhile some are dedicated to ridicule those who have academic success. This spectrum of attitudes towards the educational experience influences the quality of the interpersonal relationships that are created there and constitutes an issue that is permanently feedback, since feeling accepted or excluded is considered a psychosocial factor that can determine the student performance.

IV International Congress / Days of Applied Mathematics

IOP Conf. Series: Journal of Physics: Conf. Series 1160 (2019) 012026

The low school success that is recurrently related to mathematics subjects is a concern of teachers, which is associated with the lack of motivation of students derived from the school, social and family environment [4]. On the other hand, it is not always easy to understand and understand mathematics, but whoever dominates mathematics is usually outstanding in the classroom, which positively favors interpersonal relationships. However, the relations in the communication processes between teachers and students around the mathematics class, in some cases is quite rigid, which disfavors the interpersonal relationships between teachers and students [5]. On the other hand, collaborative work allows to improve progress in mathematics and interpersonal relations of solidarity, listening, verbal aggression and responsibility [6]

With the purpose of putting together the complete puzzle that implies the current coexistence of the I.E. It is proposed to demolish the appearances that may contain the grades, numbers and letters, to get to know how young students really feel in the teaching-learning process, and how they consider that their expectations of personal excellence affect or contribute to their ability to have quality relationships with their peers.

2. Method

From the nature of the present investigation, given the characteristics of the object of study and the context where it takes place, together with the methodological perspective adopted to study it, the project is framed in the mixed approach since from the quantitative scope a correlational method follows, from the qualitative field follows an ethnographic method.

This moment of the investigation is based on the ethnographic method, one that allows approaching the problem of study from three perspectives, all of great utility, since as an approach it allows to understand the situations when considering the point of view of the people involved, while as method motivates to go to the terrain where the events occur and as a text, allows to describe in a textual way the findings and behaviors [7].

In that order of ideas this method will deal with the nature of the problem, the personal experiences of the main actors, their attitudes and practices, as well as the characteristics of the context where it takes place, in whose inner core instruments are nested for a better analysis and interpretation of the results, from a more precise perspective. All this in order to guarantee confidence in the results as a faithful representation of what happens with the phenomenon studied.

For its part, the quantitative field will follow the correlation method, one that favors the relationship between variables, as explained by Sierra [8] "in this case, the researcher builds a test battery that includes the variables to be studied and the subjects -or a significant sample of them- they have to answer. The subsequent statistical analysis of the data will allow the researcher to obtain the certainty of the truth or falsity of his hypothesis "(p. 18).

From a perspective it will be holistic to see the scenario and people not reduced to variables, but considered as an integral whole, which obeys a logic of organization of the institution, operation and significance to understand the events from the multiple interactions that they characterize it and naturalist by focusing on the internal logic of the reality it analyzes, trying to understand people within their frame of reference.

The research has a sequential design type with a group of 40 students. The subjects of these groups have not been assigned randomly, but through voluntary participation. They will be actors of the investigation, students of sixth to eleventh grade, of the Sacred Heart of Jesus Educational Institution.

The material used in the research comes from the choice and application of the instrument called 'Interpersonal Reactivity Index' (IRI) of Davis [9], a self-administered questionnaire that has 28 items and includes 4 sub-scales that allow different evaluation dimensions of empathy [10]. The subject to be evaluated must award a score that ranges from 1 to 5 according to the degree of agreement or disagreement with each statement. The sub-scales it develops are taking perspective, empathic concern, personal suffering and fantasy and identification [11]. The second technique corresponds to the design of an interview and the third technique consists of external or non-participant observation.

The measurement of the results obtained by means of the application of the Davis Empathy Test [9] will be given by means of an analysis of each of the 4 factors that involve the instrument and the variance that exists of each other, this in the quantitative scope with the use of graphs that illustrate the findings. In the meantime, the interview presents the alternative of applying content analysis through the codification of information and the establishment of categories of analysis. Finally, the triangulation of the findings obtained through the different collection techniques is proposed.

3. Results

Qualitative analysis shows that the academic success of young people is associated with motivational, psychological or social, cultural factors that condition aspects such as the climate of coexistence, social class and family influence (Table 1). Under this view the student is not an isolated presence but the sum of different influences that lead him to behave in a certain way and choose certain priorities.

Table 1. Successful academic life factors

Factor	Characteristic
Family	-Admiration -Affectivity -Communication
Social	- Admiration -Leadership -Trust
Personali ty	-Self-esteem -Determination -Discipline -Indifference
Cultural	-Class social -Responsibility -Motivation -Commitment

Table 2. Average descriptive analysis by item.

Item	Media
Perspective shot ITEM 3	2.68
Perspective shot ITEM 8	4.32
Perspective shot ITEM 11	3.95
Perspective shot ITEM -15	2.85
Perspective shot ITEM 21	3.77
Perspective shot ITEM 25	2.90
Perspective shot ITEM 28	3.70
Fantasy and identification ITEM 1	3.67
Fantasy and identification ITEM -5	3.60
Fantasy and identification ITEM -7	2.77
Fantasy and identification ITEM 12	2.32
Fantasy and identification ITEM 16	3.10
Fantasy and identification ITEM 23	3.30
Fantasy and identification ITEM 26	3.35
Empathy concern ITEM 2	3.95
Empathy concern ITEM -4	3.50
Empathy concern ITEM 9	3.60
Empathy Concern ITEM -14	3.30
Empathy Concern ITEM -18	4.15
Empathy Concern ITEM 20	2.97
Personal suffering ITEM 6	2.12
Personal suffering ITEM 10	2.60
Personal suffering ITEM -13	2.30
Personal suffering ITEM 17	2.82
Personal suffering ITEM -19	2.47
Personal suffering ITEM 24	2.00
Personal suffering ITEM 27	2.07

The different factors that have been identified remain related and are expressed on a daily basis, to important that people believe in what one promises, that is why it is so important to fulfill "(E-024) and in the eyes of someone else" the academic success I have is the result of different efforts that start with my dad, include the teachers and then I take care of myself to fulfill the achievements "(E-036). This analysis also reflects that good grades or the excellent profile of young people is not due to a single reason and although they answer that extent students are more or less attached to one another, in the opinion of one of them "it is with indifference about relationships, in reality when they are observed they are careful to take care of their friendships, in not discuss with others and try to expand their network of acquaintances every time they start a new school year.

On the other hand, results of the empathy test indicate lower scores are given in items 6 ("in emergency situations, I feel aggressive and uncomfortable"), 24 ("I tend to lose control during

emergencies") and 27 ("When I see someone who urgently needs help in an emergency, I fall apart"), where item 6 registered an average of 2.12 that corresponds to the sub-scale of personal suffering, item 24 on the other hand had an average of 2 also of the sub-scale of personal suffering, meanwhile item 27 reached an average of 2.07, is part of the same scale mentioned previously. While the items with the highest scores were 8 ("I try to take into account each of the parties (opinions) in a disagreement (conflict) before making a decision") and the 18 ("when I see someone who is being treated unfairly, sometimes I do not feel any compassion for him "), since the item 8 registered an average of 4.32 in the sub-scale of taking perspective and for his part the item 18 had an average of 4.15, this is part of the sub-scale empathic concern (Table 2).

Results of the average corresponding to the four sub scales evaluated by the Davis Test show that the highest score is in the empathic concern dimension (24/high), meanwhile the lowest score was registered in the dimension of personal suffering with 16.4. (Table 3). In general, the dimensions yielded a normal assessment, only the dimension of empathic concern is located at the high level (Table 4). Regarding the two main subcategories that the instrument establishes: cognitive empathy, formed by the sub-scales of perspective and fantasy. A consistent willingness of the students has been found to put themselves in the place of the other and to feel identified by the experiences that consume through the media or entertainment. F to the subcategory of affective empathy that involves the sub-scales of concern and suffering reflects a lower disposition to feel uncomfortable or anxious with the bad experiences that their classmates can experience, especially when they observe directly the situations of bullying or conflict. Terms in the reagents a normality, is established in terms of the cognitive empathy of 42.9 and the emotional empathy of 41 of a possible ideal score of 70, revealing a high cognitive and affective category, reason that leads to establishing a normality in the overall measure of empathy with an average score of 83.9 compared to a possible score of 40.

Table 3. Statistical frequencies by sub scales.

		PT	FS	EC	PD
			Statistics		
Average		23.9250	18.9250	24.6000	16.4000
Medium		24.0000	20.0000	24.0000	15.5000
Fashion		23.00	20.00	22.00[a]	13.00
Deviation		3.56901	4.02803	3.37259	4.19890
Minimum		15.00	11.00	19.00	10.00
Maximum		32.00	27.00	34.00	28.00
Percentiles	5	18.0500	11.0500	20.0000	10.0500
	10	20.0000	12.2000	21.0000	12.1000
	15	20.0000	14.1500	21.0000	13.0000
	20	21.0000	15.0000	21.2000	13.0000
	25	21.0000	16.0000	22.0000	13.0000
	30	22.0000	16.3000	22.0000	13.0000
	35	23.0000	17.0000	22.3500	14.0000
	40	23.0000	18.4000	23.4000	14.0000
	45	23.0000	19.4500	24.0000	14.4500
	50	24.0000	20.0000	24.0000	15.5000
	55	24.5500	20.0000	24.5500	16.0000
	60	25.0000	20.6000	25.6000	18.0000
	65	25.0000	21.0000	26.0000	18.0000
	70	26.0000	21.0000	26.7000	18.0000
	75	26.0000	22.0000	27.0000	19.0000
	80	27.0000	22.0000	27.0000	20.0000
	85	27.8500	23.0000	28.7000	21.0000
	90	28.9000	24.0000	29.9000	21.9000
	95	30.0000	24.9500	30.0000	25.8500
	100	32.0000	27.0000	34.0000	28.0000

Table 4. Overall results of the empathic disposition

Sub-Escale	Results	Rating
Perspective Shot (PT)	23.9	Normal
Empathic concern (EC)	24.6	Alto
Personal suffering (PD)	16.4	Normal
Fantasy and Identification (FS)	18.9	Normal
Sub categories		
Cognitive empathy	42.9	Normal
Affective empathy	41.0	Normal
Global category		
Empathic disposition	83.9	Normal

4. Discussion

In social psychology authors such as Mattelart [12] heir to a long tradition of theorists including Doob and Allport consider that attitude is responsible for driving behavior in some cases relationships of congruence are established while in others considerable differences are identified regarding what someone believes and what they end up doing once they are immersed in a certain social situation.

In that order of ideas in the analysis of results of the Davis empathy test two key clusters were defined. one comprising items 10, 17, 20, 24 and 27 being one of the most significant groups when grouping 5 points that it makes reference mainly to the dimension of personal suffering and only one of them is part of the empathic concern in this case stand out statements such as "when I am in an emotionally tense situation I get scared" (item 17) or "when I see someone who needs urgently help in an emergency. I fall apart "(item 27).

The other cluster or conglomerate is made up of items 2, 8, 11, 21, 4 and 13 that belong to the dimensions of empathic concern perspective and to a lesser extent personal suffering. in which statements such as " I often have tender feelings and concern for people less fortunate than me "(item 2)." I often try to understand my friends by imagining how they see things (putting me in their place) "(item 11) and" I think that there are two parts for each question and I try to take both into account "(item 21).

In the composition of the conglomerates two predominant attitudes are determined the first one reveals how the empathic concern can be a source of tension and suffering for the students who describe that when they see their classmates affected by some conflict or problem they get uncomfortable and do not know how to respond The second one focuses on taking perspective that is the student believes that he can remain neutral in the middle of the discussions or confrontations and stop to take into account the personal opinions of his school peers.

The two dimensions that stand out dictate to a large extent the behaviors shown by the high school students of the I.E. Sacred Heart of Jesus, who in the interviews share mixed positions since a part of them has not felt cheated or excluded while others do stand out among their comments that "they mess with me when I remind teachers of the task or the exam" (E-003) also highlight that "one receives reproaches when something does not go well and gets a bad grade" (E-021).

In general, according to García Legazpe [13], school success has a multidimensional nature in which cognitive and emotional elements participate in this sense students conform their disposition and behavior according to their acceptance of the academic environment. Faced with this it is observed that students have doubts since students with a normal or deficient performance are those who tend to feel more comfortable in school, while those who have an excellent performance are those who are more critical about how they should edit his personality and behaviors in order to please in that perspective they point out that "we are indifferent to negative comments or congratulations we focus on learning more and more" (E-008). In the observations made it is often noted that they are people with few friends, several of them are shy, although competent to participate in the extra activities of the committees, some are reluctant to meet new people because they do not want to be used for their skills or knowledge. In that order of ideas, some comments were received in which they say, "I am not

interested in treating those who call me a fool for complying with the rules and being disciplined" (E-013).

The notes in the cards show a significant resistance on the part of the high-performance students to try to form new bonds and relationships, on the other hand those who have problems with the grades are the most expressive and tend to have more friends during the rest time in the backyard. Another of the behaviors that can be seen in coexistence is the superiority or self-centeredness with which students can respond when bothered by their peers in this line they express that "I like to know more than others and always understand what is happening" (E-021).

The responsibility for their good performance also generates a social pressure in which their difficulties in some areas such as physical or artistic education stimulates negative comments in the other students of the group, when they are judged they show themselves withdrawn, they close each time more to your closest social circle consisting of one or two and increases one of its characteristic behaviors, the achiever and stable, since they do not like the changes and reflect great distrust.

The oscillation between the outstanding dimensions of suffering and perspective reveals among other things that children and young people are at a crucial stage to form their social personality, in that sense although their basic impulses instigate them to care or help, they do not know how to stop be overwhelmed and choose not to risk, feign disinterest or simple indifference to the subject of interpersonal relationships.

In the contributions of Castanyer [14] prevail the concepts of self-esteem and confidence, two of the weaknesses found in the students object of study, because in them it is uncommon to see that they take positions to express their dissatisfaction with the attitudes or behavior of their peers, this situation leads them to respond in a superficial way to the questions about their experiences of coexistence and compromises their assertiveness because most of them find it difficult to clearly define their social expectations, according to Martinez [15].

In the results of the test applied around the levels of empathy two subcategories are prioritized, in which cognitive empathy is called a normal reach and the same with the affective empathy [16], despite what was found in the interviews and the observations is that most have assumed behaviors of distrust or indifference. Faced with this incongruity that is reflected between attitude and action, the empathic disposition is affected, an effort that students fail to achieve because they are more concerned with themselves than with others.

5. Conclusions

The attitudes and behaviors evidenced in the students with excellent academic performance of the Sacred Heart of Jesus School regarding their interpersonal relationships are positive with respect to how they raise them, although if they must withstand the pressure and criticism of the environment, this means that they have the perceptions and tools to manage the conflicts that arise due to the jealousy, complexes or ridicule that their other colleagues sometimes generate.

The research identifies that while the multidimensional empathy shown by learners helps them to be more tolerant and understanding of what happens in the school environment, it is sometimes external behaviors that take them away from their focus, values and personality. It is precisely in those challenges that show the strengths that bring them high educational performance.

The main factors that affect the academic and social life of the students analyzed are the family expectations and the pressures of the community of the Educational Institution, in this sense making parents feel proud is one of their main motivations for having an irreproachable behavior in the classroom and outside of it, while the demands of the school are another factor that drives them to maintain their level of performance.

In the correlations between the academic success and the students' abilities to solve social conflicts. it is evident that the dimensions that work as support for the management of the difficulties are those of taking perspective and empathic concern, both as observed and measured, they remain in feedback which allows them to be a support for the learners, who first notice the sadness or affectation that the

situation generates, be it personal or of someone else in the group and then tend to perform the exercise of putting themselves in the place of the other.

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