

DIDACTIC STRATEGIES TO FOSTER THE MOTIVATION AND CONCENTRATION IN THE COURSE OF MATHEMATICS FROM PSYCHODRAM TECHNIQUES

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María Angélica Serje Arias,
Universidad del Atlántico
mserje@mail.uniatlantico.edu.co.

Resumen

Este trabajo de investigación contempla la implementación de nuevas estrategias didácticas para fomentar la concentración y motivación a través de técnicas del Psicodrama. El objeto fundamental de esta investigación es lograr que la mayoría o todos las y los estudiantes puedan ver las matemáticas como su aliada, no como su enemiga, mostrándoles que esto puede ser posible mediante la utilización de nuevas técnicas y estrategias pedagógicas no solo dentro del aula convencional de clases, sino que las matemáticas también pueden ser enseñadas en espacios alternos abiertos, como por ejemplo la cancha de recreación y deporte de las instituciones educativas. Con este trabajo se obtuvieron buenos resultados tanto cuantitativo como cualitativamente, es decir, no solo ver los conceptos teóricos propios de la matemática en este caso la comprensión de los conjuntos numéricos y sus operaciones, sino también se pudo apreciar que los y las estudiantes se encuentran motivados (as) y deseosos de aprender, mejor será el desempeño académico en el proceso de aprendizaje.

Abstract

This research work includes the implementation of new teaching strategies to encourage concentration and motivation through Psicodrama. The fundamental aim of this research is to

¹* María Angélica Serje Arias , Matemática, Especialista en Didáctica de las matemáticas, Estudiante de Maestría de Filosofía con énfasis en Filosofía de las ciencias, Tel.: 301 7603057.
E-mail address: mariangel3123@hotmail.com; mserje@mail.uniatlantico.edu.co.

get most or all and students to view mathematics as an ally, not your enemy, showing them that this may be possible through the use of new techniques and teaching strategies not only in the classroom conventional classes but also math can be taught on alternate open spaces, such as recreation and sports court of educational institutions. With this work good both quantitatively and qualitatively, ie results were obtained not only see their own theoretical concepts of mathematics in this case compression of numerical sets and their operations but could also be seen that if the students are are motivated (as) and eager to learn, the better the academic performance of students in the learning process.

Estructura

Mathematics, being one of the main branches of knowledge, is a fundamental knowledge, given that it is implicit in our daily life, in everything we have around us, everything is written in the language of the universe, which then mathematics concretizes in a language of this science, mathematics has allowed us to see the world, understand it and organize it.

Mathematics arouses little motivation in students, since this language is shown as unattainable, teachers have been responsible for making it look like superior knowledge, leaving aside the nature of this, the teaching of mathematics has been under the traditional model, where the new generation of students has new challenges and new dynamics, the dramatic games seek to open a space in the classroom to encourage and create motivation and concentration, as emotional states necessary for there to be a good understanding in the new topic.

The research work aims to be the reconstructed bridge that unites the student with the desire to learn, to be the bridge that the teachers themselves have been in charge of tearing down with models that are not beneficial in the learning of the young people. The student is reunited with his desire to obtain the knowledge that is within him and that grows through his interaction in the classroom with his peers and his guide, in this case his math teacher.

"Until now, no matter how much active teaching has been spoken about, the result obtained is the acquisition of knowledge, neglecting the cultivation of affectivity; a conceptualized knowledge, transmitted by language, isolated from understanding. This method can be used by teachers, teachers, directors and social, educational and psychological counselors. We use it fundamentally in the following conditions: To understand a knowledge already acquired through traditional methods, to evaluate a topic, to review forgotten concepts. "(Bustos and Nosedá, 2007, p).

The teaching of mathematics has been based on a pure theoretical knowledge, has not been taken into account the relationship between emotion and learning, where the only way that has been

believed possible to understand this science is the bijective relationship between blackboard - marker and notebook pencil.

The word mathematics usually causes fear in the students of now and in those who have ceased to be, however, a problem arises when we see mathematics as a science" that we must "study in a compulsory way; it is also necessary to recognize that at present there is a great variety of cultural, economic, social and psychological factors that affect the teaching of mathematics; reasons why it is visualized as a very difficult subject that predisposes students to have an antipathy and lack of motivation to learn them. Why, if we have voluntarily decided to study a bachelor's degree, we insist on fleeing from the study of mathematics? "Mathematics, the terror of students.

The publication Mathematics, the terror of students, poses a very current question and points to the object of study in this research, motivation and concentration in the learning of mathematics, if we as teachers of mathematics, whether we have completed an undergraduate of degree or pure mathematics, sometimes we run away from this science, what can be expected from our disciples and / or students who depend on our guide to learn and practice it ?, this is where our teaching work makes sense and at the same time It becomes a challenge, motivating our apprentices to enter the wonderful, magical and fun universe of mathematics.

One of the main problems in the learning of the subject of mathematics is the low motivation and concentration of students, resulting in low quantitative and qualitative performance. This has been reflected, for example, in the results of the tests in Colombia (2014), where Colombian students scored low on the evaluation of financial education.

The analysis of this research, prepared with the collaboration of the Spanish bank BBVA, reveals that only 3.8 percent of the students evaluated showed a level of excellence, and that only one in ten could solve the most difficult questions, which involved for example the cost of a transaction or calculate the balance of an account. The 15.3 percent average that did not reach a basic level showed that, at most, it was able to recognize the use of regular financial documents, such as an invoice, and to make simple decisions about daily expenses. The report highlighted that a better result of a country in financial matters is not directly associated, despite what might seem, to the best results in mathematics and reading in other Pisa reports, but it is linked to the socio-economic environment.

In mathematics, the score of Colombia is lower than that obtained by 61 countries and is not statistically different from those observed in the countries that obtained the three lowest results: Qatar, Indonesia and Peru.

"" Of a population of 428 students, only 11.4 percent passed the basic math assessment. 45.1 percent got grades between 0 and 1, so it is at a critical level. It is extremely worrisome that most do not even surpass the low rating of 2.5. That from school come with such a low level of learning is not only an inconvenience for the student, but for the university, which faces great challenges to solve the problem, "says Martha Cecilia Tutalchá, spokeswoman for that center. These data, to which is

added a series of statistics collected since 2007, reaffirm a sad conclusion of the International Student Assessment Program (Pisa): in mathematical skills, young Colombians have a lag of more than two years of schooling in front of to students from other countries. "Andrea Linares Gómez, El Tiempo Newspaper, September 28, 2013.

In schools, many times they are more concerned with the results obtained in a quantitative way, that is, they want to obtain good results, grades, achievements, etc. But how can you get good results, grades and achievements if you do not have motivation and concentration when you learn mathematics?

The scientific interest of this research is the implementation of new pedagogical strategies where tools, resources and theatrical, dramatic, group, sociometric and psychodramatic techniques are used.

On the other hand, it is necessary to coin a term that will help us with that purpose. "The word sociometry comes from the Latin terms socius: partners, social, and metrum: measure; of where well its general sense, which is the one of social measure, measure of the social relations among the members of a group. Its initiator, Jacob Levy Moreno, defines it as the study of the evolution of groups and the position that individuals occupy in them, regardless of the problem of the internal structure of each individual ".

Now, society is configured in different ways and responds to parameters such as context, environment, age, language, tastes, preferences, race and religion, which are determined by a social group. The school, as a micro-society, is also structured in a concrete way, for this reason in each school there is an IEP and a manual of coexistence with common features, but also with specific conditions according to the configuration and school context. The pairs, in this case, the students, have both convergent and divergent traits and with the help of these traits they are located in a particular level of education to the needs and knowledge of each one of them.

With that in mind, sociometry provides us with techniques to accurately study and graphically represent existing links in not very large groups. In the same way, it will allow teachers to better understand the group and find a way to help them know their abilities. We do this with the help of the sociometric test. Once these data have been obtained, there will be the possibility of being able to act assertively in the group.

The sociogram is a graphical tool used to determine the sociometry of a "social space". In fact, it is a method that allows to measure the social relations between the members of a human group to study, in this particular case they are students of a school, of a certain course. With certainty I can affirm that it is a powerful tool in the schools, because as teachers it will allow us to make an X-ray of the group (course), being clear that each one is totally different.

The questions we could use to motivate the students are the following (these questions are particularly for the area of mathematics, since it is the area that I teach): what words come to your head when you hear the word mathematics? a complex work of mathematics and who does not ?, Which subject in the area of mathematics do you prefer? Calculation, geometry, statistics, algebra or other? What image do you have of the subject of mathematics ?. In addition, it is worth asking them to self-assess from 1 to 5, with 1 being the lowest grade and 5 the highest grade, also evaluating their teacher from 1 to 5, with 1 being the lowest grade and 5 being the highest grade. high. Likewise, they may be asked to write any suggestion or justification of the note they placed. These questions may vary in order to carry out a statistical study, but that would be another issue to be addressed, where another type of survey with clearly quantifiable values will be carried out.

In this way, through sociometry we can know the degree of interaction that exists in a group of students and their positions within it.

Tablas

In this investigation the following variables, dimensions and indicators were worked:

Variable: didactic strategies, numerical sets and psychodramatic tools.

Dimensions: Playful, Instruments and models, Use of instruments and models; Theory, Numerical sets; The psychosociodrama in education.

Indicators: Theory, Psychology, Sociology, Ethnology, Pedagogy; Model, Psychological Activities, Ethnological Study, Pedagogical files; Analysis of instruments and models; Definitions, Theorems and Corollaries, Axioms of Body and Order, Natural Numbers and Operations, Integer Numbers and Operations, Rational Numbers and Operations, Irrational Numbers and Operations, Real Numbers and Operations, Imaginary Numbers and Operations, Complex Numbers and Operations, Psychodrama in the pedagogy, Psychosociodrama in education.

SPECIFIC OBJECTIVES	VARIABLES	DIMENSIONS	INDICATORS	SOURCE
Create and implement pedagogical strategies through playful and playful games.	Teaching strategies.	1. Ludica 2. Instruments and models. 3. Use of instruments and models.	1. a. Theory. b. Psychology. c. Sociology. d. Ethnography. e. Pedagogy. 2. a. Model. b. Psychological Activities c. Ethnological study d. Pedagogical sheet.	The child and the game: Theoretical approaches and pedagogical actions, ISBN92-3201658-3, Published in 1980 by the United Nations Organization for Education, science and culture.

Motivate the learning of the concepts and theories of numerical sets.	Numerical sets	<ol style="list-style-type: none"> 1. Theory. 2. Numerical sets. 	<ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. Definitions. b. Theorems and corollaries. c. Axioms of body and order. 2. <ol style="list-style-type: none"> a. Natural Numbers and Operations. b. Whole Numbers and Operations. c. Rational Numbers and Operations. d. Irrational Numbers and Operations. e. Imaginary Numbers and Operations. f. Complex Numbers and Operations. 	Mathematics before calculation, Louis Leithold, 3rd edition. Fundamentals of Mathematics, Jorge Rodríguez Contreras and Jorge Robinson Evilla, Universidad del Atlántico.
Use psychodramatic and sociometric techniques for the group and individual concentration of the students.	Psychodramatic tools.	The Psycho-Sociodrama in Education.	<ol style="list-style-type: none"> a. Pedagogical Psychodrama. b. Psycho-Sociodrama in Education. 	Manual of psychodrama in psychotherapy and education, Dr. Dalimiro M. Bustos, Prof. Elena Nosedá. 2007, Printed in Graphic Workshops of SRL. ISBN 978987906044-5.

In order to achieve the objectives set at the beginning of this research, sociometric tests and theoretical knowledge test of the subject were implemented and their information was entered in a table, then we will see the initial test, ie the diagnostic test and the final test applied to students in grade 11. Statistics of the knowledge tests carried out before and after applying the psychodramatic didactic model.

Statistics		
	Test before the model	Test after the model
Number of students	53	53
Media	1,8038	3,4642
Median	1,5000	3,4000
Moda	1,00	3,20
Typical deviation	1,19518	,46123

Variance		1,428	,213
Rank		4,60	2,10
Mínimum		,00	2,90
Máximum		4,60	5,00
Percentiles	25	1,0000	3,2000
	50	1,5000	3,4000
	75	2,7000	3,6000

A test of knowledge before and after the model was applied to 53 students of grade 11 of the Betsabe Espinosa District Educational Institution, the average before the application of the psychodramatic tools was 1.8 and after the application was 3.4 we can observe the significant increase in student grades after the application of the psychodramatic model, in the evaluation before the model the minimum score was 0 (zero) and after the model of 2.9 we also observed

the increase in the minimum score of the students of grade 11, in the same way it is observed that the maximum score before the model is 4.6 and after the model is 5.0.

Hypothesis testing

The following hypotheses will be verified with a 95% confidence, which implies that the margin of error is 5%, which will be the value of $\alpha = 5\% = 0.05$.

The hypotheses are:

Null hypothesis = H_0 = The academic performance of eleventh grade students of the Betsabe Espinosa district IE remained the same before and after applying the psychodramatic didactic model.

Alternative hypothesis = H_a = The academic performance of the eleventh grade students of the Betsabe Espinosa district IE presented differences before and after applying the psychodramatic didactic model.

Decision rule:

If $\alpha = 5\% = 0.05$. It is less than sigma (sig) the null hypothesis is rejected and the alternative hypothesis is accepted.

If $\alpha = 5\% = 0.05$. It is greater than sigma (sig) the alternative hypothesis is rejected and the null hypothesis is accepted.

Calculation of sigma and verification.

Group statistics

Group	N	Media	Typical Deviation.	Single error of the average
Knowledge Test	Before the model	1,8038	1,19518	,16417
	Affter the model	3,4642	,46123	,06335

We see in the table an increase in the mean before the application of the psychodramatic model and after the application of this model, we also note that the deviation decreases, that is, the data are more compact and close, in the same way the error of the half.

Test of independent samples

		Levene's test for equality of variances		Test T for equality of means						
		F	Sig.	t	df	Sig. (bilateral)	Difference of the medias	Error típ. de la diferencia	95% confidence interval for the difference	
									Lower	higher
Test_conocimiento	Equal variances have been assumed	35,820	,000	-9,436	104	,000	-1,66038	,17597	-2,00933	-1,31142
	Equal variances have not been assumed			-9,436	67,152	,000	-1,66038	,17597	-2,01160	-1,30915

Conclusion of the hypothesis test:

It can be seen that the sigma value is 0.000 and that this value is less than the alpha ($\alpha = 5\% = 0.05$) therefore the null hypothesis is rejected and the alternative hypothesis is accepted.

Based on the above it can be observed that, if there is a significant difference of 95% of confidence, applying the psychodramatic didactic model, which has been effective since we noticed the significant increase in the results obtained quantitatively by the students of the degree 11 of the Betsabe Espinosa District Educational Institution.

Show that concentration and motivation in the subject of calculation can be improved through psychodramatic tools.

In the following chart, the trend for each indicator is observed globally, these are: Theoretical, Psychodramatic, Pedagogical and Playful.

Indicador	Totalmente desacuerdo	En desacuerdo	Ni de acuerdo ni desacuerdo	De acuerdo	Totalmente de acuerdo	Tendencia del los indicadores
- Teórico,	8,33%	9,58%	22,92%	32,50%	26,58%	Estar de acuerdo a los fundamentos Teòricos
- Psico-sociodramatico,	9,17%	4,58%	18,33%	38,75%	29,08%	Estar de acuerdo a los fundamentos psico-social
- Pedagógico,	4,17%	2,50%	10,83%	44,17%	38,33%	Estar de acuerdo a los fundamentos pedagogicos
- Lúdico,	14,17%	6,67%	25,83%	33,33%	19,83%	Estar de acuerdo a los fundamentos Ludicos

The following table shows the result of the sociometric test by question, the indicator and its response.

Pregunta/ Respuesta	Indicador	Totalmente desacuerdo	En desacuerdo	Ni de acuerdo ni desacuerdo	De acuerdo	Totalmente de acuerdo	%
1, ¿Considera usted la asignatura de matemáticas importante para su vida?	- Teórico,	2,50%	2,50%	7,50%	25%	62,50%	100,00%
	- Psico-sociodramatico,						
	- Pedagógico,						
2, ¿Las estrategias evaluativas utilizadas en clases de matemáticas han fomentado tu motivación para mejorar el rendimiento académico en la asignatura de matemáticas?	- Psico-sociodramatico,	2,50%	2,50%	12,50%	62,50%	20%	100,00%
	- Pedagógico,						
3, ¿Se siente motivado(a) en las clases de matemáticas?	- Lúdico,	30,00%	0%	33%	20%	17,50%	100,00%
	- Psico-sociodramatico,						
4, ¿Al momento de resolver un problema en la asignatura de matemáticas logra una concentración adecuada para abordar el problema?	- Teórico,	5%	12,50%	37,50%	37,50%	7%	100%
5, ¿Los juegos y ejercicios lúdicos realizados por tu docente de matemáticas han fomentado tu interés en la asignatura?	- Psico-sociodramatico,	7,50%	2,50%	15%	50%	25%	100,00%
	- Lúdico,						
6, ¿Si en clases de matemáticas la docente pide que se armen grupos para la realización de un trabajo difícil por ejemplo desarrollar una serie de ejercicios de operaciones entre conjuntos numéricos crees que tus compañeros(as) te escogerían como primera opción?	- Teórico,	17,50%	15%	35%	17,50%	15%	100,00%
7, ¿Si en clases de matemáticas la docente pide que se armen grupos para la realización de un trabajo creativo lúdico como por ejemplo una cartelera acerca de los conjuntos numéricos crees que tus compañeros(as) te escogerían como primera opción?	- Psico-sociodramatico,	5%	17,50%	30%	30%	17%	100%
	- Lúdico,						
8, ¿Consideras que tu desempeño académico ha sido superior o alto en la asignatura de matemáticas?	- Teórico,	12,50%	25%	30%	20%	12,50%	100,00%
9, ¿Consideras que has podido esforzarte más en la asignatura de matemáticas?	-Teórico,	5%	0%	15%	50%	30%	100%
10, ¿Consideras que tu docente de matemáticas te ha enseñado la utilidad de las matemáticas en la vida cotidiana?	- Teórico,	7,50%	2,50%	12,50%	45%	32,50%	100,00%
	- Psico-sociodramatico,						
	- Pedagógico,						
Tendencia Global (Promedio)		9,50%	8,00%	22,75%	35,75%	23,90%	
Escala Numerica		1	2	3	4	5	

It is noted that the trend in question 1 is Strongly agree, question 2 is OK, question 3 Neither agree nor disagree, question 4 is Neither agree nor disagree- Agree as they have the same percentage, the question 5 is OK, question 6 is Neither agree nor disagree, question 7 is Neither

agree nor disagree- Agree since they have the same percentage, question 8 is Neither agree nor disagree, question 9 is De agreement and question 10 is OK.

In the global trend the average of Totally Disagree is 9.5%, Disagreement is 8.0%, Neither agree nor disagree is 22.75%, Agree is 35.75% and Totally agree is 23.90%.

This research project entitled STRATEGIES TEACHING TO PROMOTE THE MOTIVATION AND CONCENTRATION IN THE COURSE OF MATHEMATICS FROM TECHNICAL psychodrama teaching from the psychodramatic knowledge strategies were developed, these methods of action include theoretical, practical and research support in different areas human, such as education, business, clinic, community social and family.

The three basic psychodramatic moments were unfolded, such as warming, dramatization and sharing, in addition to the execution of the tools of this model that come from the lead author Jacob Levi Moreno. In this sense, in the classroom, the teacher developed theatrical games of interiorization, breathing and concentration.

One class is described as follows: We start the class by placing chairs around the room, so u, then everyone stand up and close their eyes, group coordinator (teachers in this case) starts say a number that is takes a count where someone in the group should follow the sequence one at a time, ie the teacher begins diciendo1 and one or another student should follow with 2 other or another with the 3 and so on up to 20 , then they are returned saying 19 until they reach number 1, the idea of the game is that no number "stumbles" with another is to say no student speak at the same time or say the same number at the same time. This game is done to warm up the group to encourage concentration and silence in the classroom, they saw the need to connect with the group and they noticed the need to listen to the other and to himself.

The next game is to make a circle and try to give all at the same time a slap, then 2, then 3 until you reach 6 and return.

Once the exercise is clear, they are placed in groups of 3 students and each group is given a sequence with their palms, where each sequence has a specific rhythm and a certain speed. Pass each group to the center of the circle and show its sequence to the rest of the group. This theatrical and psychodramatic exercise helps the students to concentrate and carry a count without the need of the voice.

The next game is that all the participants walk in a row but with the left and right steps marked and counted, they begin to walk in a row synchronizing the steps all together left and right, stop and move 5 times in the most synchronized way possible, all they have to start and stop simultaneously, they take 3 steps forward and the fourth stops, then they continue 5 times, they

take 3 steps forward and the fourth step will take a step back, repeat 5 times, give 4 steps forward and step 5 are two steps back, repeat 5 times.

The last game consists of walking as if they were sequenced geometric figures that is simulating that they are triangles, circles, diamonds, squares, rectangles, in that same order and they repeat each student is enumerated from 1 to 5, where number 1 corresponds to walk as a triangle, number 2 corresponds to walk as a circle, number 3 corresponds to walk as a diamond, number 4 corresponds to walk as squares and number 5 corresponds to walk as a rectangle. This is the step of dramatization where they felt like geometric figures.

We finished the class with a round table where each student explained which game he felt identified or identified with, what did he learn? And how he carries these games for his daily life.

In this research project it is observed that the objectives were met 100%.

The variables involved were measured and contrasted through hypothesis testing, resulting in the psychodramatic didactic model influencing students' academic performance in a positive way.

The Betsabe Espinosa District Educational Institution observed an appropriate and significant academic scenario for the teaching of the numerical sets in the calculus subject.

The students felt encouraged to change the traditional didactic strategy for this new proposal described in this research project and as a consequence their performance in the academic activities and the understanding of the topics were better.

A normal statistic was applied since the sample was 53 students, these results were satisfactory with 95% Confidence interval for the difference it was observed that the minimum score before the application of the model was 0.0 and the maximum of 4, 6 and after applying the model the minimum grade was 2.9 and the maximum grade of 5.0.

RECOMMENDATIONS

To apply this model requires open alternate spaces, such as a large room, or a patio with trees where students leave the classroom and also interact with nature, basic materials such as cards, papers, colors, colored markers, plasticine , video beam and a computer.

The teacher of mathematics must have knowledge of psychodramatic tools, theatrical games and full conviction of unraveling their traditional didactic practices and weaving new ones of their own and current context of the new needs of today's students.

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A mi familia perruna y humana.

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