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Disruptive Behaviors and its Impact on Meaningful Learning in BGU Students

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Abstract---*The research called Disruptive Behaviors and their impact on meaningful learning in BGU students. Its objective was to identify disruptive behaviors and their impact on meaningful learning in BGU students from the "Raymundo Aveiga" Educational Unit. For this purpose, the research had a qualitative, quantitative and descriptive approach with the purpose of generating information based on the results obtained during the implementation of the EFECO questionnaire to the students. This questionnaire was made up of 67 items that allowed the evaluation of executive functions such as: emotional control, monitoring, organization of materials, initiative, and working memory. The sample consisted of 40 BGU students from this institution. Some results indicate that, when comparing the knowledge of the electric field, the results obtained at the post-test level show the same trend, that is, an average of 5.25 students was obtained for the first group and an average of 5.45 for the second group. Finally, the alternative hypothesis is accepted $H_a =$ There are significant learning differences between the group that shows disruptive behaviors and the students who do not show disruptive behaviors.*

Keywords---*Disruptive behaviors, incidence, significant learning*

Introduction

Disruptive behaviors are so old that they have been observed since the beginning of society and, with time and with technological advances and the greater freedom that students have had, it has allowed their behaviors to be variable, even more so, in the last years of the 20th century and in the current times of the 21st century, where families somehow separate family control due to the parents' work and the schedules that must be met. The above is, among other elements, those that prevent good behavior in students.

When we talk about disruptive behaviors, it is considered part of indiscipline, it is referring to the behaviors that prevent carrying out a series of activities with the rhythm and regulations that are planned, this phenomenon occurs at every educational level and in all educational institutions, and, especially in semi-urban and rural schools and societies. These behaviors have an impact on the teaching-learning process since students who present disruptive behaviors are those who have special educational needs and, generally, poor academic performance (Breitenstein et al., 2009; Martel et al., 2012; Rosenstein & O'Daniel, 2008).

Disruptive behavior is one of the disruptive behavior disorders characterized by permanent challenging behavioral problems that violate basic rights of coexistence and norms, rules or laws. School dropouts are interconnected with disruptive behaviors, having a profound impact on the educational system; disruptive behaviors can be the result of a combination of biological, psychological and environmental factors (Mendoza & Burgos, 2024).

Disruptive behaviors originate from the problems that students have in adapting to the school environment and, with them, students try to attract the attention of their classmates or the teacher and achieve a status of power in the classroom. In some cases, the student frequently appears nervous, bored, irritable, angry, dissatisfied, provocative, constantly defiant of teachers and authorities, finding himself isolated from friends and classmates, and in the face of calls for attention from parents and family, the feeling of incompetence increases, giving As a result, low self-esteem deteriorates family and socio-cultural ties (Chiffot et al., 2008; Parisi et al., 2013; Wibmer et al., 2010).

Disruptive behaviors are established by several factors such as genetic or hereditary, they refer to the innate behavior that exists in the individual at birth; External factors are the behavior that is learned in a certain situation. Disruptive behaviors are the response to a stimulus in which psychological, physiological and motor components are involved. Students who present disruptive behavior problems also present difficulties in their school performance because they present different cognitive, affective and behavioral characteristics as a result of the lack of adequate teaching methodological strategies that interest students in learning certain topics (Baeten et al., 2010; Chang et al., 2008; Bakkenes et al., 2010).

In this context, the research called disruptive behaviors and their impact on meaningful learning in BGU students adopted a qualitative, quantitative and descriptive approach. Its objective was to determine disruptive behaviors and their impact on meaningful learning in BGU students from the "Raymundo Aveiga" Educational Unit in the city of Chone. At the same time, we seek to test the following hypotheses: H_a = There are significant learning differences between the group that shows disruptive behaviors and the students who do not show disruptive behaviors and H_o = There are no significant learning differences between the group that shows disruptive behaviors and students who do not show disruptive behaviors.

Materials and Methods

The research adopted a quantitative, qualitative and descriptive approach. The methodologies used were related to the inductive method, through which the information collected is organized and analyzed, to conclude the particular scope of the problem raised until reaching the general one. At the same time, these methodologies were also related to the deductive method through which the current situation of the teaching-learning process in the BGU students of the "Raymundo Aveiga" Educational Unit of the city of Chone was evidenced.

A descriptive, longitudinal level of research with a quasi-experimental design was determined. Initially, the collection of information was carried out through the implementation of the EFECO questionnaire, this questionnaire was made up of 67 items, which contributed to evaluating the different executive functions of the students involved. According to Ramos et al. (2019), the EFECO questionnaire is an instrument that allows for assessing executive functions from an ecological perspective, since it is based on the behavioral report of the subject's daily life.

For this purpose, at first, a demonstration class on the fundamentals of the electric field was held for the control group made up of 20 students (they did not show disruptive behavior), using only the school text provided by the Ministry of Education, and, in where the teaching material was the photographs that appear therein. In a second moment, a demonstration class was held for the experimental group made up of 20 students (Evidence of disruptive behaviors) using the PhET virtual simulator. The population was made up of teachers and students from the "Raymundo Aveiga" Educational Unit in the city of Chone, province of Manabí. Therefore, the sample consisted of a total of 40 third-year BGU students.

Result and Discussion

Disruptive behaviors

Adolescence constitutes a critical stage, which poses a series of demands and demands certain intellectual and behavioral skills on the part of the student (Briones & Ramos, 2023). Any behavior that disturbs the harmony of the educational environment can be identified as disruptive behavior, a manifestation that carries both psychological and educational implications. This type of behavior usually hinders the learning process and acts as a distraction for members of the school community (Vaca, 2024).

Disruptive behaviors are a phenomenon that has gained relevance in recent years; these behaviors are manifested through attitudes that interrupt the normal development of academic activities and the adequate coexistence environment in educational institutions (Briones & Ramos, 2023). At the same time, it is important to understand that these behaviors can vary in their manifestation, from contempt for authority to verbal or physical aggression between students or towards teaching staff (Heras, 2023).

It is essential to recognize that disruptive behaviors have a negative impact on the teaching-learning process; the constant presence of these behaviors, can generate an environment of insecurity and discomfort, which directly affects the concentration and academic performance of students (Ormachea, 2023). Disruptive behaviors exert a significant influence on the students' learning process According to (Villacrés et al., 2024).

It is highlighted that disruptive behavior in students is a multifactorial phenomenon that affects daily classroom activities, promoting behaviors associated with a lack of respect, power conflicts and situations of violence, which commonly challenge the authority of the teacher, forcing him to spend more time controlling and disciplining the class (Haro et al., 2023). On the other hand, two key points that increase the risk of developing disruptive behavior, these are an unfavorable family environment and maladaptive relationships in the school context, this being the environment with the greatest impact and where behavioral alterations ranging from interfering with the learning process as in social interaction (Zambrano et al., 2021).

Disruptive behaviors have been defined as behaviors that interrupt classroom activities and tasks, forcing the teacher to invest a lot of time in redirecting said behaviors instead of allocating them to the teaching-learning process (Corral & Gómez, 2021). Disruptive behaviors are categorized as more or less serious depending on interpersonal relationships, schoolwork, and general classroom rules. They are associated with factors such as impulsivity, poor social skills, negative interpersonal relationships, low capacity for self-criticism, lack of self-esteem, difficulty in complying with rules, low tolerance for frustration, poor coping strategies for stress, and low academic performance (Martínez & Brave, 2020). One of the characteristics of this type of behavior is the manifestation of opposition to the norm in an abrupt, aggressive and impulsive manner (Zambrano et al., 2021).

The lack of interest and skills among teachers to address these situations can have negative consequences for both the academic development of students and their emotional and psychological well-being. For this reason, it is essential to foster collaboration between parents and teachers to address these behaviors comprehensively and guarantee the success and well-being of students in the classroom (Carrera et al., 2023).

In this way, disruptive action in students offers an inappropriate field for learning and creates great difficulties in the procedures and processes of learning activities. It causes a negative atmosphere between students and the teacher. It has a markedly unsatisfactory academic result since the group with disruptive behavioral characteristics may have consequences of academic failure (Sánchez, 2020). Disruptive behaviors witnessed in the educational institution have a negative impact on the school system (Moreno et al., 2023). However, to combat these disruptive behaviors, strategies are needed, which refer to the methods and approaches those educators use to facilitate the student's learning process and foster an environment of participation and collaboration (Vaca, 2023).

Meaningful learning

According to what Baque & Portilla (2021) explain, learning is significant when new information acquires meaning through a kind of anchoring in the student's pre-existing cognitive structure, that is when the new knowledge is substantially attached. , logical, coherent and non-arbitrary in concepts and propositions already existing in their knowledge structure with clarity.

Meaningful learning should focus on getting students to understand and apply their cognitive and socio-emotional skills in real situations. On the other hand, Olivos et al. (2023), highlight that, because they are in a society in constant technological change, they must solve problems, make decisions and build a successful and resilient future.

Thus, [Posso et al. \(2021\)](#), ensure that this learning not only focuses on academic knowledge but also the development of motor, affective, cognitive and social skills.

For this reason, [Olivares & Scarpino \(2023\)](#), explain that this type of learning becomes an important challenge for students and teachers since it goes beyond good classes, the attendance and discipline of students, technically correct evaluations and systematic methodological control by part of academic management. Along these same lines, [Salica \(2021\)](#), states that meaningful learning involves a dynamic in the development of metacognitive competencies. It takes into account that academic content and motivation are predominant in the student's impact.

Motivation is understood as a predisposition, energy or force of an internal and positive nature that moves the subject to carry out learning by developing their skills, abilities and attitudes ([Flores & Cotrina, 2024](#)). On the other hand, motivation is a key concept in the teaching and learning process, since it can significantly influence academic performance and the student's interest in the content that is being presented ([Espinosa & Pérez, 2023](#)).

Without motivation, the teaching process cannot be completed, at least not in an effective way. The demands and implications that educational institutions have require superior effort and dedication that must be accompanied by a motivational factor to be able to address all requirements on time ([Santander & Schreiber, 2022](#)).

Meaningful learning is very important in the educational process because it is the human mechanism par excellence to acquire and store the vast number of ideas and information represented by any field of knowledge. The acquisition and retention of large bodies of subject matter are indeed very impressive phenomena when one considers that: a) human beings, unlike computers, can learn and immediately remember only a few discrete items of information presented to them. at once, and b) the memory of mechanically learned lists, which are presented many times, is notoriously limited by time and by the size of the list itself unless it is “overlearned” and reproduced frequently ([Ausubel et al., 1978](#)).

Currently, digital educational tools have merged and drastically transformed the traditional educational paradigm, with the constant connectivity of the use of the Internet. There are several reasons for this investigation to be carried out in-depth; since, students' learning has changed radically, by not having physical contact with the teacher and a stable guide in tasks within the classroom. Virtual educational tools improve and motivate the development of students' skills, at the same time creating meaningful learning in the minds of those pupils, which starts by generating good study habits ([Ponce, 2021](#)).

Constructivist educational praxis is understood as an own and interactive educational activity that involves a mediating teacher, and active students who construct knowledge and significant mathematical content, and, as a reflective action. As a way of carrying out the pedagogical process, it includes a way of acting, a student-centered practice, a teacher who facilitates learning, and a practice focused on content and teaching strategies. As a reflective action, it involves reflection, reflection on teaching and learning strategies and reflection on its role ([Miranda, 2022](#)).

Analysis of Results

The arguments for which the research was carried out were related to the behavioral problems and the impact on the significant learning of BGU students from the “Raymundo Aveiga” Educational Unit in the city of Chone, province of Manabí. To implement the EFECO questionnaire, 67 aspects were chosen that cover functions related to monitoring, emotional control, organization of materials, initiative and working memory, through which the executive functions of 40 students were evaluated.

The EFECO questionnaire is an instrument that allows for assessing executive functions from an ecological perspective since it is based on the behavioral report of the subject's daily life. Executive functions are essential for the student to concentrate, avoid being distracted, listen to advice, follow classroom guidelines, actively interact with classmates and maintain control over their emotions, avoiding maladaptive behaviors. Therefore, it is not a strange situation that executive functions are considered a key tool for the development of human beings in the educational field and that these are directly associated with the psychological well-being of the student ([Trigueros et al., 2023](#)). Figure 1 shows the result of the EFECO questionnaire.

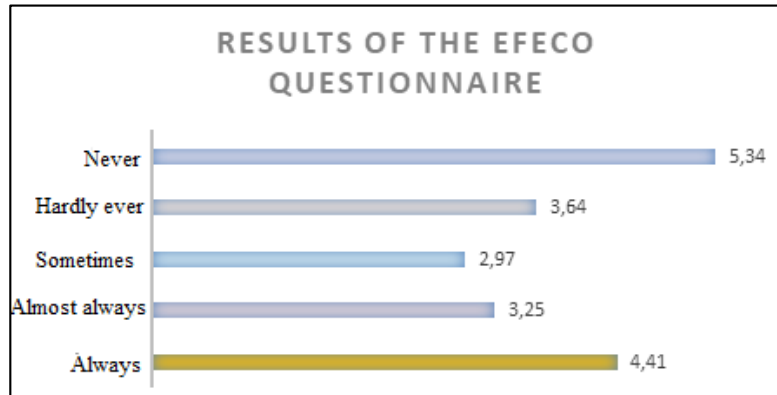


Figure 1. EFECO questionnaire results
Source: Questionnaire applied to BGU students

This research focused on identifying the behavioral problems of BGU students in the “Raymundo Aveiga” Educational Unit. Managing to carry out activities that allow evaluating significant learning in students. In this way, determine the impact on executive functions and where these types of behaviors distract students and teachers. Initially, this exercise had the purpose of identifying the disruptive behaviors of each of the participating students. As well as form two groups of students (20 each) based on the results obtained. A group made up of students with tendencies to develop disruptive behaviors with an average of 4.41 students and another group that did not, with an average of 5.34 students.

In a second moment, it was evaluated whether the attitudes of disruptive behaviors impacted in one way or another on student learning. As well as it was also investigated whether virtual environments provide and motivate contents of practical use to the educational process. Verify that virtual simulators motivate the active participation of students in the classroom regardless of whether the student exhibits disruptive behaviors. For this, an exercise was proposed through which the PhET simulator was used to explain the fundamentals of the electric field. The purpose of the exercise was to generate information that allowed us to demonstrate the impact that the use of virtual environments had on the participating students to motivate the learning of the electric field, see Table 1.

The objective of the research was to determine the impact of virtual environments as a pedagogical strategy to motivate learning of the electric field at the BGU level that evidence disruptive behaviors of this institution. As well as test the proposed hypotheses: H_a = There are significant learning differences between the group that shows disruptive behaviors and the students who do not show disruptive behaviors or H_o = There are no significant learning differences between the group that shows disruptive behaviors and the students that do not show disruptive behavior.

Table 1
Pre and post-test analysis

Experimental group			Control group		
#	Score Pre-test	Score Post-test	#	Score Pre-test	Score Post-test
E1	4	7	N1	3	6
E2	3	6	N2	3	6
E3	3	5	N3	4	5
E4	4	7	N4	5	6
E5	3	6	N5	3	5
E6	4	7	N6	2	6
E7	4	6	N7	4	5
E8	2	4	N8	2	3
E9	2	5	N9	3	6
E10	4	6	N10	2	4
E11	2	5	N11	2	4
E12	3	6	N12	3	7
E13	4	7	N13	4	6

Experimental group			Control group		
#	Score Pre-test	Score Post-test	#	Score Pre-test	Score Post-test
E14	3	6	N14	2	5
E15	4	5	N15	3	6
E16	2	5	N16	2	4
E17	2	5	N17	3	4
E18	5	6	N18	5	6
E19	2	5	N19	2	4
E20	3	6	N20	3	4
Media	3.15	5.45	Media	3.00	5.25

Source: Application of pre and post-test to BGU students

When analyzing the results obtained with the implementation of a pre and post-test regarding the impact of the PhET simulator in teaching the electric field in students who demonstrate disruptive behaviors and those who do not show disruptive behavior. The results obtained based on the pre-test carried out suggest that when calculating the average of the first group, an average of 3.00 students was obtained. When calculating the average of the second group, an average of 3.15 students was obtained. It is shown that there was no significant difference between both groups when evaluating their knowledge. When comparing the knowledge of the electric field, the results obtained at the post-test level, an average of 5.25 students was obtained for the first group and an average of 5.45 for the second group, that is, there is no significant difference, which is shown in Table 2.

Table 2
Group indicators

Group indicators					
	Information test	N	Media	Standard deviation	Mean standard error
Posttest evaluations	Experimental	20	5.25	1.529	0.332
	Control	20	5.45	1.602	0.364

Source: Results of Post-Test Analysis

When analyzing the differences obtained with the implementation of a post-test regarding the impact of the PhET simulator in teaching the electric field to students (Disruptive Behaviors and Non-Disruptive Behaviors). At the level of the first group, a mean of 5.25 was calculated, showing a standard deviation of 1.529 and a mean standard error of 0.332. The calculation made it possible to show that, for the second group, a mean of 5.45 was calculated, which gives a standard deviation of 1.602 and a mean standard error of 0.364, as shown in Table 3.

Table 3
Differences (control and experimental groups)

Independent Samples Test							
Evaluations	Levene's test of equal variance		t-test for equality of means				
	F	Significance	t	gl	Sig (bilateral)	Significant difference	Standard error difference
Equal variances are assumed	1.359	0.254	2.28	37	0.030	0.799	0.345
Equal variances are not assumed			2.28	35.12	0.031	0.800	0.345

Source: Knowledge test, participating groups

In the parameters related to the independent sample t-test, where the main values do not show a significant difference in the parameters established for the evaluation, they mark a value of 0.030 at the Significance level (bilateral). In the aspects related to the significant differences, 0.799 was recorded and the standard error difference was recorded as 0.345. On the other hand, the results of Levene's equality of variance test had a significance of 0.254. Taking into

consideration the factors that contribute to indicate whether the difference between the two means of the groups (Control and experimental), can be considered significant when the larger level of p requires less difference between the means ($p < 0.05$). Consequently, there are no significant differences between the post-test evaluations between the control and experimental groups. The result of the Student's T-test p -value = 0.030; Which means that the null hypothesis is rejected and the alternative hypothesis is accepted. Consequently, there is a significant difference in the impact that the PhET simulator has as a teaching strategy in teaching the electric field.

Discussion

Currently, the educational system has developed multiple strategies aimed at reorienting the behavioral problems evident by many students at the BGU level. However, it is worrying to observe how this type of behavior has been gaining ground and generating difficulties for students in various educational units, creating a series of difficulties that are difficult to address due to the complexity of the environment in which they develop. Bad behavior is a factor that hinders and limits normal classroom activities, impeding the teacher's work. In the same way, it negatively affects the normal development and meaningful learning of all students (Saldarriaga-Zambrano & Reyes-Ávila, 2024).

The research revealed an important aspect that relates to the difficulty that many students have in learning, with the existence of possible problems at the level of disruptive behavior and demotivation. In this sense, by asking questions such as: Are there learning differences between the group that shows disruptive behaviors and the students who do not have these behaviors? It is a message that alerts the educational community about the urgent need to adopt new educational approaches. At the same time, a fundamental contradiction arises between the urgent need to adequately handle the various manifestations related to disruptive behavior by teachers and partial or total ignorance of the subject. This circumstance caught the attention of the researchers when they found that an average of 4.41 students Always require help, almost always an average of 3.25 students, sometimes an average of 2.97 students, Almost Never an average of 3.64 students and Never an average of 5.34 students requires help to satisfactorily fulfil executive functions, such as: Functions related to monitoring, emotional control, organization of materials, initiative and working memory.

It should be noted that an educational institution is a study space where a countless number of students come together, each of them coming from diverse environments and realities. But at the same time, each of them has different problems that often affect their self-esteem, and normal academic performance, and they frequently show violent and uncooperative behavior. Therefore, it is necessary to determine the real impact that disruptive behaviors have on students' meaningful learning.

To educate it is essential to define what is human and how it should be human. The greatest richness in both definitions ensures the best education because it will translate into a commitment to a comprehensive proposal. Education is impoverished and betrayed if it categorically circumscribes and limits the vision of man and his possibilities of development (Noro, 2018). In this sense, the incorporation of exercises based on the use of virtual simulation had the fundamental purpose of introducing didactic tools aimed at motivating and developing significant learning in students who demonstrated disruptive behaviors.

When posing the hypothesis: $H_a =$ There are significant learning differences between the group that shows disruptive behaviors (Experimental) and the students who do not show disruptive behaviors (Control). Its verification was positive since the results obtained through the EFECO questionnaire showed that a significant segment indicated that it always requires collaboration in matters of executive functions, such as, for example: Functions related to monitoring, emotional control, organization of materials, initiative and working memory. Consequently, there is a significant difference in the impact that the PhET simulator has as a didactic strategy in teaching the electric field

Conclusions

With the implementation of the EFECO questionnaire as an instrument that allows assessing executive functions from an ecological perspective, it was evident that an average of 4.41 students always require help to be able to fulfil executive functions. Almost always an average of 3.25. Sometimes an average of 2.97, Almost Never an average of 3.64 and Never an average of 5.34 students. This shows that there is an important segment of students who have difficulty in aspects such as functions related to monitoring, emotional control, organization of materials, initiative, and working memory, among others.

The research on disruptive behaviors and their impact on meaningful learning in BGU students at the "Raymundo Aveiga" Educational Unit, allowed us to verify through the implementation of a post test that when calculating the

group average, the students who do not show disruptive behaviors (Control) a value of 5.25 was obtained, in turn, when calculating the mean of the group that shows disruptive behaviors (Experimental) a value of 5.45 was evident. This means that the results were as expected, that is, a significant difference was found due to the use of teaching strategies based on the use of the PhET simulator.

The data obtained corroborate that, according to the alternative hypothesis, there are significant learning differences between the group of students who do not show disruptive behaviors (Control) and the group of students who show disruptive behaviors (Experimental). This reaffirms the concept that by using virtual environments such as the PhET simulator, students with disruptive behaviors become motivated and can even improve their academic performance.

When testing the hypothesis raised in this research, the information obtained demonstrated, through the application of the Student's T test, that the probability value $p = 0.030$; which means that the null hypothesis is rejected and the affirmative hypothesis is accepted. Consequently, a significant difference is evident when determining the effectiveness of simulation tools in learning the electric field in BGU students from the "Raymundo Aveiga" Educational Unit of the city of Chone.

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