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VIRTUAL COLLABORATIVE WORK IN THE PRODUCTION OF ARGUMENTAL TEXTS IN SECONDARY FOURTH STUDENTS IN TIME OF COVID-19

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ABSTRACT

The present research was developed with the objective of determining how virtual collaborative work influences the production of argumentative texts in secondary school students of a public institution in COVID-19 time. It was of the applied type of quantitative approach with quasi-experimental design following the guidelines of the four groups of Solomon: Two experimental groups (classroom A and classroom C) and two control groups (classroom B and classroom D) in which 100 students participated who were evaluated with a rubric of argumentative text production. The instrument had three dimensions: Superstructure, macrostrutura and microstructure. A set of activities related to the production of argumentative texts through virtual collaborative work was carried out in each of the program sessions in which the pilot groups participated. The results of the research suggest that virtual collaborative work allows the achievement of the production of argumentative texts.In this sense, it is important that teachers are trained in the

management of virtual collaborative tools so that they work with the students successfully proposed activities.

KEYWORDS: *Virtual collaborative work, argumentative text, superstructure, macrostructure and microstructure*

INTRODUCTION

The knowledge and information society demands that education leave traditional practices and propose a practice that encourages human beings to learn throughout their lives (Hernandez, 2017). This means that, from school, the individual develops the ability to use the information they access, understand, process and transform it to function in different situational contexts. Under this context, in today's democracies, educational systems around the world face great challenges in which the school seeks to develop the maximum capacities of students with equality and respecting differences, favoring the training of people with autonomy that can make coherent decisions (Goren & Yemini, 2017).

For this reason, during the last twenty years, there has been a worldwide concern to improve education systems by approaching the curriculum in new ways and understanding new ways of executing the teaching-learning procedure with new educational models (Pérez et al., 2018). Of these documents prepared by UNESCO (The United Nations Educational, Scientific and Cultural Organization) and the OCDE (Organization for Economic Cooperation and Development), one of them is entitled Definition and Selection of Competences (DeSeCo) that has helped OCDE countries and the European Union begin to reformulate the school curriculum prioritizing the concept of competencies, considering the growing figure of information and communication technologies (Muukkonen et al., 2020; OCDE, 2013).

In Peru, Regular Basic Education (EBR) is based on the National Basic Education Curriculum (CNEB), a document that provides the guidelines to develop pedagogical work (Ministerio de Educación, 2016). This document proposes that the Communication area develop

competencies. One of which is: he writes various types of texts in his mother tongue; This competence is defined as a reflective process in which written language is used to elaborate meaningful texts that can be communicated to other people in an adequate and organized way (MINEDU, 2016). Furthermore, The National Center for Education Statistics Report, 2012 (NAEP) noted that only 25% of argumentative essays by students contain solid reasons and supporting examples (Ferretti & Graham, 2019).

Some aspects that affect this problem are those exposed by Gasca and Díaz-Barriga (2016)when they explained that teachers and students do not have a clear definition of what an essay is. That students show difficulty in producing them because they do not know their structure, elements and their social function. They add that a high percentage of students do not clearly establish the relationship between assumed thesis and concessions, do not support their arguments, are unaware of the kinds of arguments to defend their ideas because they confuse it with the expository text.

All these difficulties are also observed in the fourth grade students of the educational institution N ° 0086 José María Arguedas, of the UGEL 05, which have been evidenced in the different evaluation instruments applied in 2019, such as, rubrics and observation guides, in which it is appreciated that they have serious difficulties when expressing their ideas in argumentative texts, since they do not write the thesis adequately, they do not support the arguments, the ideas lack cohesion and coherence and they do not cite sources. In addition, given the real scenario of isolation due to the epidemic as a result of COVID-19, they forced the education sector to change its exclusively face-to-face classes to remote education. In this sense, the use of ICT is of interest in the knowledge of the argumentative elements latent in the discourses of the students in virtual spaces, exhorting the educational authorities to take advantage of technological tools to enhance the argumentative production of students (Bolivar et al., 2015).

As an alternative to all these difficulties that constitute the problem in students, it is intended to develop written argumentative competence through virtual collaborative work. This approach is very important, since, to face the new competitive tendencies in this century through remote teaching.

These circumstances led to the general objective of determining how virtual collaborative work influences the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19. Likewise, the specific objectives were: (1) Identify how virtual collaborative work influences the superstructure of argumentative text production in fourth year high school students of a public institution in time of COVID-19. (2) Identify how virtual collaborative work influences the macrostructure of argumentative text production in fourth year high school students of a public institution in time of COVID-19. (3) Identify how virtual collaborative work influences the microstructure of argumentative text production in fourth-year high school students of a public institution in the time of COVID-19.

It was considered as a general hypothesis: Virtual collaborative work significantly influences the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19. And the specific hypotheses were: (1) Virtual collaborative work significantly influences the superstructure of the production of argumentative texts in fourth-year high school students of a public institution in the time of COVID-19. (2) Virtual collaborative work significantly influences the macrostructure of argumentative text production in fourth-year high school students of a public institution in the time of COVID-19. (3) Virtual collaborative work significantly influences the microstructure of the production of argumentative texts in fourth year high school students of a public institution in the time of COVID-19.

MATERIALS AND METHODS

1.1 Type and design of research

The present investigation had a quantitative approach, because statistical analysis was used. The type of research was applied, in this regard, Hernández et al. (2014) indicated that its objective is problem solving, it is also known as active, practical, empirical or dynamic research because it recognizes its findings and theoretical contributions to provide problem solving with the aim of impacting the benefit of society . The level was explanatory, because its purpose was to explain the causes that originated its effect (Soto, 2014).

The study design was experimental because, faced with the existing problem of low production of argumentative texts, the influence of the program production of argumentative texts through virtual collaborative work was evaluated, presented as an alternative to optimize the writing of the written discourse of the groups studied. Being the quasi-experimental study by the application to four intact groups considering the Solomon model distributed in four groups: two controls and two experimental. Two were subjected to the pre-test (one from the control group and one from the experimental group) and all groups were administered the post-test. Being an advantage since the researcher can verify the possible effects of the pre-tests on the post-tests (Hernández et al., 2014).

RG_1	0_1	X	0_2	0_2, 0_4, 0_5 y 0_6 = Post test
RG_2	0_3	-	0_4	X = Program
RG_3	-	X	0_5	_ = without program
RG_4	-	-	0_6	

0_1 y 0_3 = Pre test

Variables and Operationalization

Independent variable 1. Virtual collaborative work

Conceptual definition: Collaborative work is a process in which the person learns by interacting with their peers, contrasting their ideas in the search for the construction of new knowledge; enhances social interrelation based on dialogue and listening among its members, implying that classroom activities overcome rote and mechanical learning (Revelo-Sánchez et al., 2018).

Independent variable 2. Production of argumentative texts

Conceptual definition: The production of argumentative texts seeks to convince the reader about a certain controversial topic; where a protagonist presents the arguments to a real or imaginary antagonist whom to convince with reasoning supported by arguments, data or facts and a conclusion that synthesizes the theme and the arguments presented (Lo Cascio, 1998). The argumentative texts are subject to a discursive structure called superstructure that contains thesis, arguments and conclusion; a macrostructure that organizes topics and subtopics considering the cohesion and coherence mechanisms, and finally, the microstructure, in charge of grammatical structures, spelling and use of vocabulary (Dijk, 1980).

Operational definition: A production rubric for argumentative texts was applied, which was made up of 20 criteria and evaluated the superstructure, macrostructure and microstructure dimensions.

Population: For Kerlinger and Lee (cited in Soto, 2014), the population is the set of components, which have similar characteristics appropriate to the research interest of the researcher. Reason for which they will be involved in the research hypotheses. The student population consisted of 140 students in the fourth year of high school.

Sample: For Hernández et al. (2014), the sample is a subgroup, a subset of the population characterized by belonging to a specific population. The study sample being intentional, because the researcher selects the individuals due to the characteristics of the study. The sample was 100

participants. This grade had four sections “A” (25), “B” (25), “C” (25) and “D” (25).

Sampling: In relation to sampling, Sánchez et al. (2018) indicated that the sample of individuals is extracted from a population by probabilistic or non-probabilistic sampling system. For Hernández et al. (2014), is non-probabilistic when the researcher selects the sample based on subjectivity and considering the factors of his research. In the case of this study, as already explained above, it is a non-probabilistic and intentional sampling because no formula or statistical procedure was applied. Inclusion criteria (fourth-year high school students with regular attendance, with connectivity and who participated in Google Classroom) and exclusion criteria (students without connectivity who did not participate in Google Classroom) were applied.

Unit of analysis: Azcona et al. (2013)defined unit of analysis as the “Type of object defined by the researcher to be investigated”. In this case study, it was made up of each of the research students.

Técnicas e instrumentos de recolección de datos.

Data collection techniques and instruments

The research used the technique of writing. According to Sánchez et al. (2018)the technique is mainly oriented to obtain and transform valuable information for the solution of certain knowledge problems; Every technique presents an application instrument.

Along these lines, for the dependent variable, production of argumentative texts, a written test was applied that was scored with an evaluation rubric. The rubric is an evaluative record that usually gradually measures the achievements that students must develop and the degree they have reached (Culquicóndor, 2018). It was measured on an ordinal scale through items not achieved, in process, and achieved. The

rubric used was adapted from the expository text evaluation instrument used by (Cabezas, 2019) to the production of argumentative texts.

On the other hand, the consistency of an instrument is obtained through reliability or reliability. In this regard, Hernández et al. (2014)stated that "it refers to the degree to which its repeated application to the same individual or object produces the same results" (p. 200). In the present study, due to the characteristics of the instrument applied, the one designed was on a Likert-type scale where Not achieved = 1; In process = 2; and Achieved = 3, its reliability was evaluated through Cronbach's alpha test; applied to a pilot group of 20 students outside the sample.

For the interpretation of the value obtained from Cronbach's alpha coefficient, the De Vellis scale of values was taken (cited by Fernández, 2017). Being the coefficient of Cronbach's Alpha obtained of 0.866 that showed that the degree of reliability of the instrument was very good.

Procedimientos

Several steps were followed to carry out the investigation. First, authorization was requested from the director of the I.E. Second, it was coordinated via zoom, with the deputy director of General Training and the teachers of the Communication area. Third, the dates for the execution of the program (X) were planned. Fourth, a meeting was called via zoom for parents of the control groups to provide facilities for their children. Fifth, the pre-test (01 and 03) was applied to groups 1 and 2 (Classrooms A and B), which lasted 60 minutes. Sixth, 16 learning sessions were developed with a duration of 90 minutes each via zoom to groups 1 and 3. (Classrooms A and C). Seventh, the post-test (01, 02, 03 and 04) was applied to all experimental and control groups (1, 2, 3 and 4), that is, to the 4 classrooms (Classrooms A, B, C and D). Finally, the information that resulted from the investigation was collected, processed and interpreted by the researcher.

The intervention in experimental groups 1 and 3 (Classrooms A and C) consisted in the execution of a program with learning sessions in the Communication area on the production of argumentative texts through virtual collaborative work. Collaborative online tools were considered in the sessions, so that participants could develop synchronous and asynchronous writing activities in a group.

Data analysis method

Descriptive and inferential statistics were considered. Information was handled with ordinal variables and ordinal inferential statistics were used using the SPSS 25, processed using non-parametric tests such as the Kruskal Wallis multiple Chi-square statistic (analogous to ANOVA) (Berlanga & Rubio, 2012) and for the comparison between pairs, the Mann Whitney U test (analogous to Student's t test for independent samples) was used.

Likewise, the reliability of the instruments was obtained by calculating the Cronbach's alpha coefficient. Finally, for the inferential analysis, the Kruskall Wallis test statistics for multiple samples and the Mann Whitney U test statistic were used for comparison of two groups.

RESULTS

A. Descriptive analysis

Table1: *Control groups and experimental groups*

Grupo	**Formación de Grupos**	**Medida Pre-tratamiento**	**Tratamiento Experimental**	**Medida Pos-tratamiento**
Experimental	Aula A	O1	X1	O2
Control	Aula B	O3	-	O4
Experimental	Aula C	-	X1	O5
Control	Aula D	-	-	O6

Note. SPSS version 25

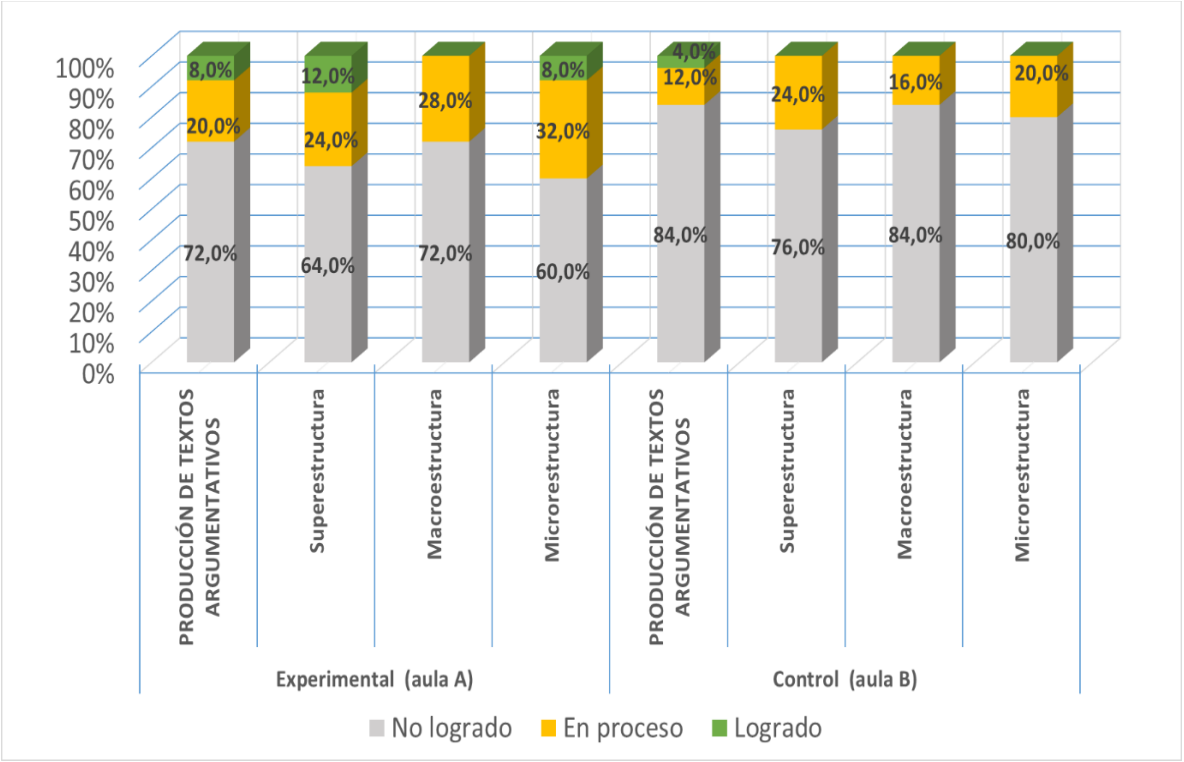
Table2: *Comparison of groups in the pretest Classroom A and Classroom B*

			grupo	
			Aula A	Aula B
Producción de textos argumentativos	No logrado	Recuento	18	21
		% dentro de grupo	72,0%	84,0%
	En proceso	Recuento	5	3
		% dentro de grupo	20,0%	12,0%
	Logrado	Recuento	2	1
		% dentro de grupo	8,0%	4,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Superestrutura	No logrado	Recuento	16	19
		% dentro de grupo	64,0%	76,0%
	En proceso	Recuento	6	6
		% dentro de grupo	24,0%	24,0%
	Logrado	Recuento	3	0
		% dentro de grupo	12,0%	0,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Macroestructura	No logrado	Recuento	18	21
		% dentro de grupo	72,0%	84,0%
	En proceso	Recuento	7	4
		% dentro de grupo	28,0%	16,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Microestructura	No logrado	Recuento	15	20
		% dentro de grupo	60,0%	80,0%
	En proceso	Recuento	8	5
		% dentro de grupo	32,0%	20,0%
	Logrado	Recuento	2	0
		% dentro de grupo	8,0%	0,0%

Total	Recuento	25	25
	% dentro de grupo	100,0%	100,0%

Note. SPSS version 25

Figure 1: *Comparison of groups in the pretest Classroom A and Classroom B*



Note. The figure shows the comparison of groups in the pretest Classroom A and Classroom B

The table and figure above show that the groups that presented the pre-test, both the experimental group (Classroom A) and the control group (Classroom B), show that both groups are at the level of Not achieved, this being the predominant level in both study groups. Thus, for the experimental group there is a 72% level not achieved in the variable Production of argumentative texts, compared to 84% of the control group Classroom B.

For the Superstructure dimension in the experimental group 64% is at the level not achieved compared to 76% in the control group. Regarding the macrostructure dimension, the experimental group has 72% at the level not achieved, while the control group presents 84% of not achieved. Finally, in the microstructure dimension, the experimental

group presents 60% at the unsuccessful level, while for the control group 80% is at the unsuccessful level.

With these results, it is concluded that both groups are in similar conditions before the application of the program, being the main requirement for its execution.

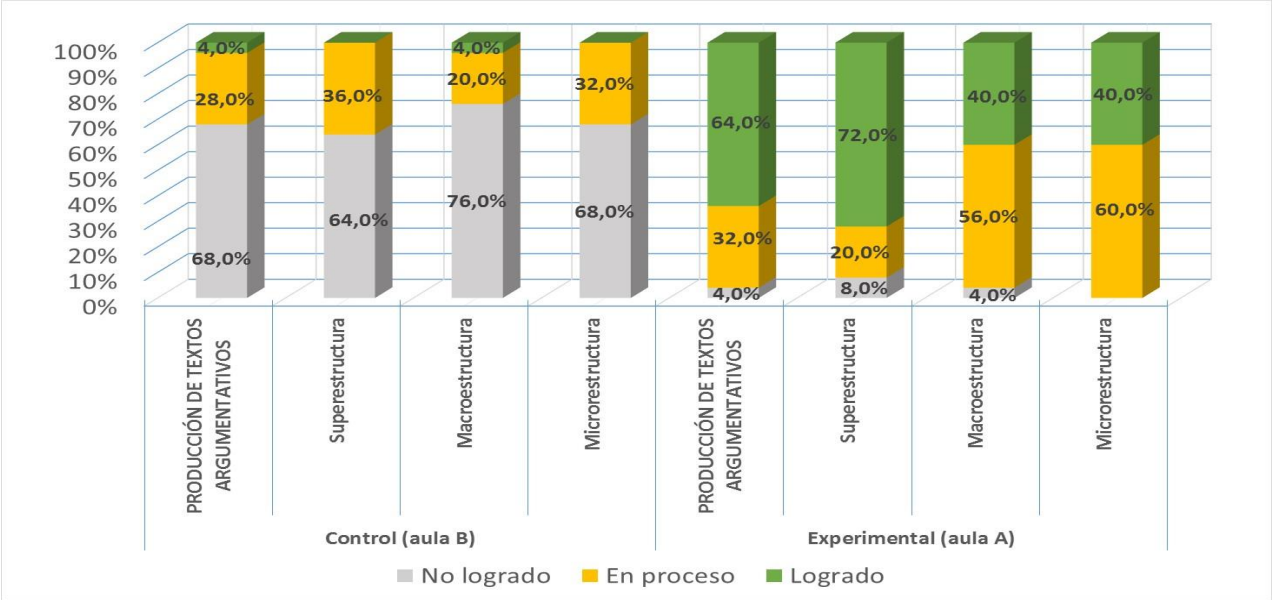
Table3: *Comparison of groups in the post-test Classroom A and Classroom B (classrooms that present pretest)*

			Grupo	
			Aula A	Aula B
Producción de textos argumentativos	No logrado	Recuento	1	17
		% dentro de grupo	4,0%	68,0%
	En proceso	Recuento	8	7
		% dentro de grupo	32,0%	28,0%
	Logrado	Recuento	16	1
		% dentro de grupo	64,0%	4,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Superestrutura	No logrado	Recuento	2	16
		% dentro de grupo	8,0%	64,0%
	En proceso	Recuento	5	9
		% dentro de grupo	20,0%	36,0%
	Logrado	Recuento	18	0
		% dentro de grupo	72,0%	0,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Macroestructura	No logrado	Recuento	1	19
		% dentro de grupo	4,0%	76,0%
	En proceso	Recuento	14	5
		% dentro de grupo	56,0%	20,0%
	Logrado	Recuento	10	1
		% dentro de grupo	40,0%	4,0%

Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Microestructura	No logrado	Recuento	0	17
		% dentro de grupo	0,0%	68,0%
	En proceso	Recuento	15	8
		% dentro de grupo	60,0%	32,0%
	Logrado	Recuento	10	0
		% dentro de grupo	40,0%	0,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%

Note. SPSS version 25

Figure 2: *Comparison of groups in the post-test Classroom A and Classroom B*



Note. Comparison of groups in the post-test Classroom A and Classroom B (classrooms that present pre-test)

The table and figure above show differences between the levels of achievement found in the post-test in the groups to which the previous test (pre-test) was applied, it is evident that it is the experimental group that presents the best levels of achievement. Regarding the variable Production of argumentative texts with only 8% with unsuccessful level, 32% in process and 64% with achievement levels. In addition, in the Superstructure dimension, 8% are not achieved, 20% are in process, and

72% are achieved, in the case of the macrostructure dimension, 4% are not achieved, 56% are in process and 40 % present levels of achievement, finally, in the Microstructure dimension, 60% present levels in process and 40% are at the level achieved.

These first results give us the first approach to the success of the program applied in the experimental group (Classroom A), evidencing the non-influence of external factors unrelated to this, such as the previous test.

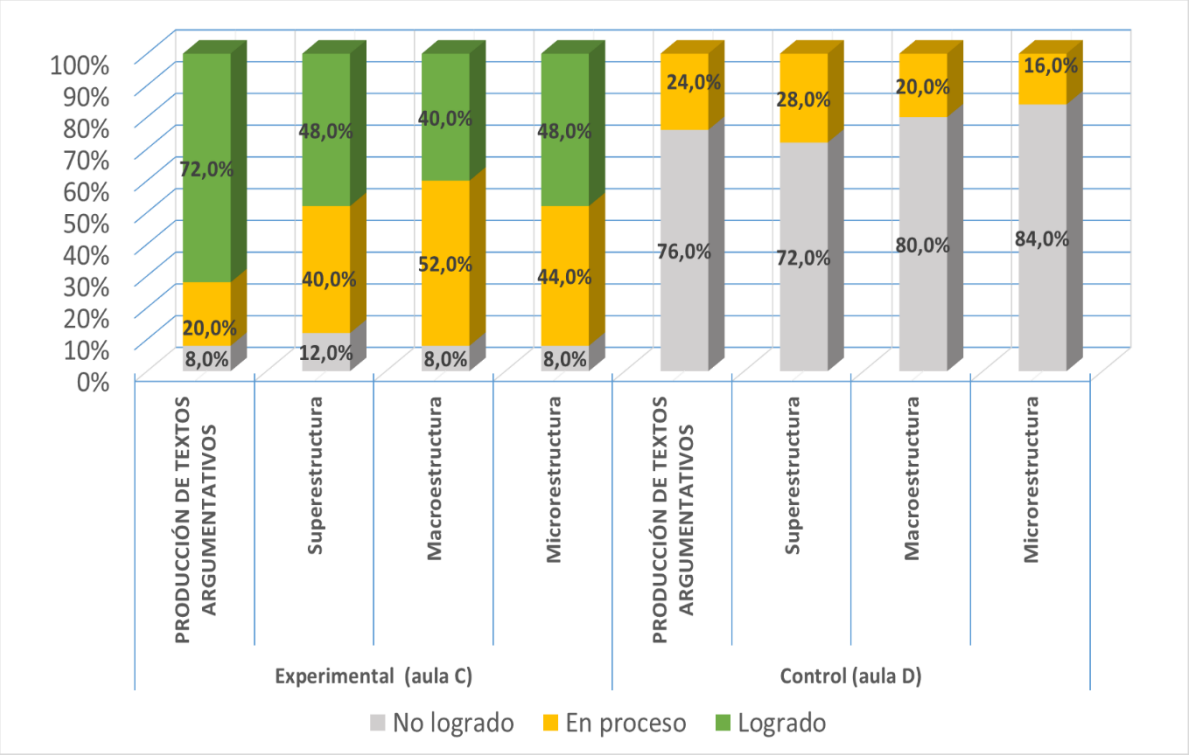
Table 4: *Comparison of the groups in the post-test (groups that did not present a pre-test)*

			grupo Aula C	AulaD
Producción de textos argumentativos	No logrado	Recuento	2	19
		% dentro de grupo	8,0%	76,0%
	En proceso	Recuento	5	6
		% dentro de grupo	20,0%	24,0%
	Logrado	Recuento	18	0
		% dentro de grupo	72,0%	0,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Superestrutura	No logrado	Recuento	3	18
		% dentro de grupo	12,0%	72,0%
	En proceso	Recuento	10	7
		% dentro de grupo	40,0%	28,0%
	Logrado	Recuento	12	0
		% dentro de grupo	48,0%	0,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Macroestructura	No logrado	Recuento	2	20
		% dentro de grupo	8,0%	80,0%
	En proceso	Recuento	13	5
		% dentro de grupo	52,0%	20,0%
	Logrado	Recuento	10	0
		% dentro de grupo	40,0%	0,0%

Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Microestructura	No logrado	Recuento	2	21
		% dentro de grupo	8,0%	84,0%
	En proceso	Recuento	11	4
		% dentro de grupo	44,0%	16,0%
	Logrado	Recuento	12	0
		% dentro de grupo	48,0%	0,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%

Note. SPSS version 25

Figure 3: *Comparison of results Groups C and D*



Note. Comparison of the Classroom C and Classroom D groups in the post-test (groups that did not present a pre-test)

Through the results of the table and previous figure, it is concluded that it is the students of the experimental group who did not receive the pretest who have the highest levels of achievement

(classroom C) compared to the control classroom (D), thus the first presented in the variable production of argumentative texts 8% at the level not achieved, 20% in process and 72% present level achieved. In the case of the Superstructure variable, 12% present a level not achieved, 40% in process, and 48% at the level achieved. The macrostructure dimension only presents 8% at the level not achieved, 52% in process and 40% with the level achieved. Finally, in the microstructure dimension, 8% are at the unsuccessful level, 44% at the in-process level, and 48% at the achieved level. These results show that the pretest did not influence the improvement of achievement levels in the study sample.

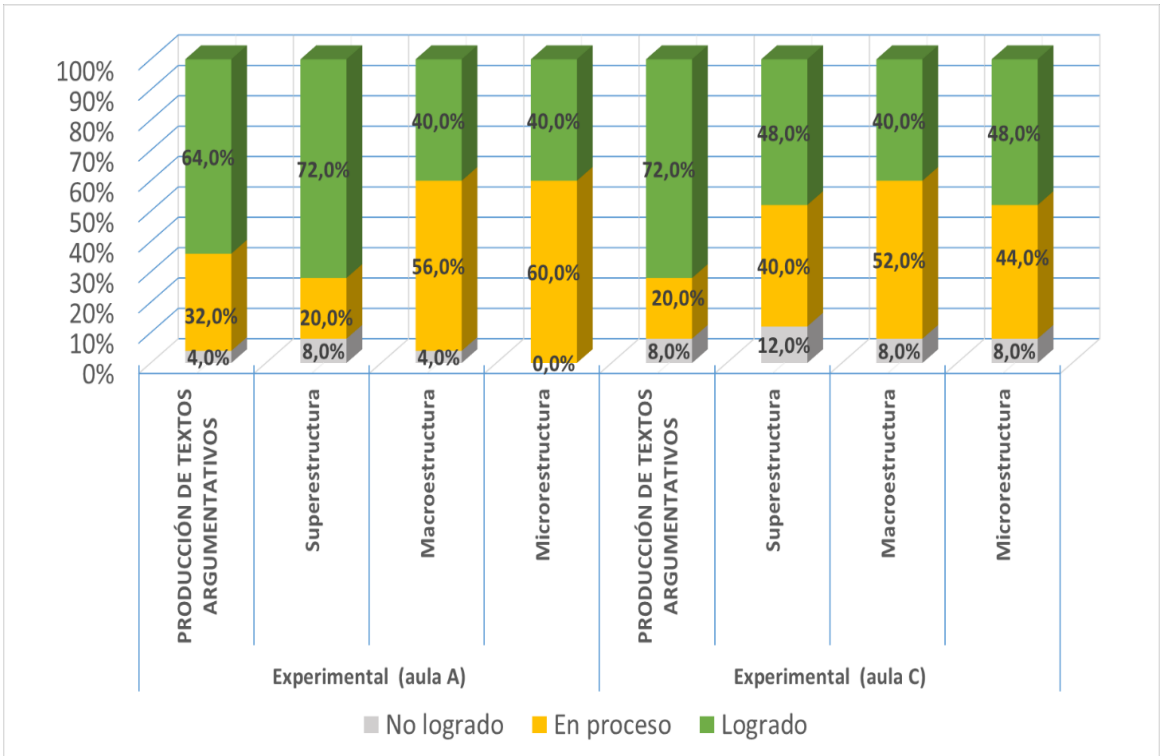
Table5: *Comparison of the groups in the posttest (experimental groups A and C)*

			grupo Aula A	Aula C
Producción de textos argumentativos	No logrado	Recuento	1	2
		% dentro de grupo	4,0%	8,0%
	En proceso	Recuento	8	5
		% dentro de grupo	32,0%	20,0%
	Logrado	Recuento	16	18
		% dentro de grupo	64,0%	72,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Superestrutura	No logrado	Recuento	2	3
		% dentro de grupo	8,0%	12,0%
	En proceso	Recuento	5	10
		% dentro de grupo	20,0%	40,0%
	Logrado	Recuento	18	12
		% dentro de grupo	72,0%	48,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Macroestructura	No logrado	Recuento	1	2
		% dentro de grupo	4,0%	8,0%

	En proceso	Recuento	14	13
		% dentro de grupo	56,0%	52,0%
	Logrado	Recuento	10	10
		% dentro de grupo	40,0%	40,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%
Microestructura	No logrado	Recuento	0	2
		% dentro de grupo	0,0%	8,0%
	En proceso	Recuento	15	11
		% dentro de grupo	60,0%	44,0%
	Logrado	Recuento	10	12
		% dentro de grupo	40,0%	48,0%
Total		Recuento	25	25
		% dentro de grupo	100,0%	100,0%

Note. SPSS version 25

Figure 4: *Comparison of Classroom A and C groups in the post-test*



Note. Comparison of the groups in the posttest (experimental groups A and C)

In the results obtained from the processing of the experimental groups (classrooms A and C), it is evident that there are improvements

in their achievement levels and this possibly due to the application of the program in these groups.

That is why, for the experimental group (Classroom A) with previous test, their achievement levels for the variable Production of argumentative texts is 64%, for the superstructure dimension it is 72%, the macrostructure dimension has 40% in the level achieved and finally similar 40% is presented in the Microstructure dimension. For the case of the Experimental Classroom C group, without prior test, the variable Production of argumentative texts is 72%, for the superstructure dimension it is 48%, the macrostructure dimension has 40% at the achieved level and finally 48 % is presented in the Microstructure dimension. It is concluded that the application of the experiment, program, with or without previous test improves achievement levels in the study sample.

Inferential Analysis and Hypothesis Testing

Table6: *Normality test*

		Shapiro-Wilk		
	grupo	Estadístico	gl	Sig.
Pretest				
Producción de textos argumentativos	Aula A	,610	25	,000
	Aula B	,461	25	,000
Superestrutura	Aula A	,679	25	,000
	Aula B	,533	25	,000
Macroestructura	Aula A	,565	25	,000
	Aula B	,445	25	,000
Microestructura	Aula A	,706	25	,000
	Aula B	,493	25	,000
Postest				
Producción de textos argumentativos	Aula A	,671	25	,000
	Aula B	,643	25	,000
	Aula C	,610	25	,000
	Aula D	,533	25	,000

Superestrutura	Aula A	,610	25	,000
	Aula B	,610	25	,000
	Aula C	,767	25	,000
	Aula D	,565	25	,000
Macroestructura	Aula A	,729	25	,000
	Aula B	,569	25	,000
	Aula C	,766	25	,000
	Aula D	,493	25	,000
Microestructura	Aula A	,625	25	,000
	Aula B	,590	25	,000
	Aula C	,756	25	,000
	Aula D	,445	25	,000

Note. SPSS version 25

General Hypothesis Contrast

H_0. Virtual collaborative work does not significantly influence the production of argumentative texts in fourth year high school students of a public institution in the time of COVID-19

H_1. Virtual collaborative work significantly influences the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19

Table7: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Producción de textos argumentativos Pretest	Aula A	25	27,02	675,50	U de Mann-Whitney=274,500
	Aula B	25	23,98	599,50	Z= -1,021
	Total	50			P valor = 0,307
Producción de textos argumentativos	Aula A	25	35,58	889,50	U de Mann-Whitney=60,500
	Aula B	25	15,42	385,50	Z= -5,190

Postest	Total	50	P valor = 0,000

Note. SPSS version 25

The results show that both groups do not present significant differences in their attainment levels obtained, with Mann Whitney's U = 274,500 with p-value = 0.307> 0.05, after the application of the experiment in the experimental group (Classroom A) improvements are evident significant in their achievement levels with respect to the control group (Classroom B) with U of Mann Whitney = 60,500 and p-value = 0.00 <0.05; This first comparison of the 2 samples with the control group allows us to know the degree of sensitivity of the pretest measurement if it truly influences the results of the study.

Table 8: *Value of the Contrast Statistic*

	Grupo	N	Rango promedio	Estadístico de prueba Kruskall Wallis
Producción de textos argumentativos	Aula A	25	70,72	Chi-cuadrado=58,603
	Aula B	25	31,62	Gl= 3
	Aula C	25	71,86	P valor = 0,000
	Aula D	25	27,80	
	Total	100		

Note. SPSS version 25

The second statistic obtained was the Kruskall Wallis test in the four groups that present post-test, it was evidenced that there are significant differences between at least 2 groups of the sample, the groups in classroom A having higher values in their average ranges with 70.72 and classroom C with 71.786, which shows that the experiment has had results in the applied groups, with the Kruskall Wallis statistic (chi square = 58.603 and with p-value = 0.000 <0.05.

Table9: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Producción de textos argumentativos	Aula A	25	24,72	618,00	U de Mann-Whitney=293,000
	Aula C	25	26,28	657,00	Z= -,463
	Total	50			P valor = 0,643

Note. SPSS version 25

The comparison of the post-test to the two samples to which the experiment was applied to know if any of them present higher levels of achievement in the production of argumentative texts, shows that there are no significant differences between them with U of Mann Whitney = 293,000 with pvalue = 0.643> 0.05, showing that the previous test has not had any effect on the treatment, concluding that the program was successful.

Table10: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Producción de textos argumentativos	Aula B	25	26,62	665,50	U de Mann-Whitney=284,500
	Aula D	25	24,38	609,50	Z= -,696
	Total	50			P valor = 0,486

Note. SPSS version 25

Finally, the comparisons made to the groups to which the program was not applied show that there are no significant differences in their achievement levels obtained with the Mann Whitney U test = 284,500 with p-value = 0.486> 0.05, demonstrating that the Non-application of

the experiment in the control study groups does not influence their levels of achievement.

Therefore, it is concluded that: Virtual collaborative work significantly influences the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19

Specific Hypothesis Test 1

H_0 Virtual collaborative work does not significantly influence the superstructure of argumentative text production in fourth-year high school students of a public institution in the time of COVID-19

H_1. Virtual collaborative work significantly influences the superstructure of the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19

Table11: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Superestructura Pretest	Aula A	25	27,36	684,00	U de Mann-Whitney=266,000
	Aula B	25	23,64	591,00	Z= -1,125
	Total	50			P valor = 0,261
Superestructura Postest	Aula A	25	35,74	893,50	U de Mann-Whitney=56,500
	Aula B	25	15,26	381,50	Z= -5,280
	Total	50			P valor = 0,000

Note. SPSS version 25

The results show that both groups do not present significant differences in their levels of achievement, with Mann Whitney's U = 266,000 with p-value = 0.261> 0.05, after the application of the experiment in the experimental group (Classroom A) improvements are evident significant in their levels of achievement with respect to the control group (Classroom B) with U of Mann Whitney = 56,500 and p-

value = 0.00 <0.05; This first comparison of the 2 samples with the control group allows us to know the degree of sensitivity of the pretest measurement if it truly influences the results of the program.

Table12: *Value of the Contrast Statistic*

	Grupo	N	Rango promedio	Estadístico de prueba Kruskall Wallis
Superestructura postest	Aula A	25	74,16	Chi-cuadrado=51,474
	Aula B	25	32,60	Gl= 3
	Aula C	25	65,44	P valor = 0,000
	Aula D	25	29,80	
	Total	100		

Note. SPSS version 25

The second statistic obtained was the Kruskall Wallis test for the four groups that present post-test, it was evidenced that there are significant differences between at least 2 groups of the sample, with higher values in their average ranges, the groups in classroom A with 74.16 and classroom C with 65.44, which shows that the experiment has had results in the applied groups, with the Kruskall Wallis statistic (chi square = 51.474 and with p-value = 0.000 <0.05.

Table13: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Superestrutura postest	Aula A	25	28,40	710,00	U de Mann-Whitney=240,000
	Aula C	25	22,60	565,00	Z= -1,618

	Total	50			P valor = 0,106

Note. SPSS version 25

The comparison of the post-test to the two samples to which the experiment was applied to know if any of them present higher levels of achievement in the production of argumentative texts, shows that there are no significant differences between them with U of Mann Whitney = 240,000 with pvalue = 0.106> 0.05, showing that the previous test had no effect on the treatment, concluding that the application of the program was successful.

Table14: *Value of the Contrast Statistic*

				Suma de rangos	**Estadísticos de prueba**
	Grupo	N	Rango promedio		
Superestructura	Aula B	25	26,50	662,50	U de Mann-Whitney=287,500
	Aula D	25	24,50	612,50	Z= -,600
	Total	50			P valor = 0,548

Note. SPSS version 25

Finally, the comparisons made to the groups to which the experiment was not applied show that there are no significant differences in their achievement levels obtained with the Mann Whitney U test = 287,500 with p-value = 0.548> 0.05, demonstrating that the Non-application of the program in the control study groups does not influence their levels of achievement.

Therefore, it is concluded that: Virtual collaborative work significantly influences the superstructure of the production of argumentative texts in fourth year high school students of a public institution in the time of COVID-19.

Specific hypothesis test 2

H_0 = Virtual collaborative work does not significantly influence the macrostructure of the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19

H_1 = Virtual collaborative work significantly influences the macrostructure of the production of argumentative texts in fourth year high school students of a public institution in the time of COVID-19

Table15: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Macroestructura pretest	Aula A	25	27,00	675,00	U de Mann-Whitney=275,000
	Aula B	25	24,00	600,00	Z= -1,014
	Total	50			P valor = ,311
Macroestructura postest	Aula A	25	35,22	880,50	U de Mann-Whitney=69,500
	Aula B	25	15,78	394,50	Z= -5,052
	Total	50			P valor = ,000

Note. SPSS version 25

The results show that both groups do not present significant differences in their levels of achievement, with Mann Whitney's U = 275,000 with pvalue = 0.311> 0.05, after the application of the experiment in the experimental group (Classroom A) improvements are evident significant in their levels of achievement with respect to the control group (Classroom B) with U of Mann Whitney = 69,500 and p-value = 0.00 <0.05; This first comparison of the 2 samples with the control group allows us to know the degree of sensitivity of the pretest measurement if it truly influences the results of the experiment.

Table 16: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Estadístico de prueba Kruskall Wallis
Macroestructura postest	Aula A	25	71,02	Chi-cuadrado=53,573
	Aula B	25	32,14	Gl= 3
	Aula C	25	69,44	P valor = ,000
	Aula D	25	29,40	
	Total	100		

Note. SPSS version 25

The second statistic obtained was the Kruskall Wallis test in the four groups that present post-test, it was evidenced that there are significant differences between at least 2 groups of the sample, the groups in classroom A having higher values in their average ranges with 71.02 and classroom C with 69.44, which shows that the experiment has had results in the applied groups, with the Kruskall Wallis statistic (chi square = 53.573 and with p-value = 0.000 <0.05.

Table17; *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Macroestructura postest	Aula A	25	25,80	645,00	U de Mann-Whitney=305 ,000
	Aula C	25	25,20	630,00	Z= -1,65
	Total	50			P valor = ,869

Note. SPSS version 25

The comparison of the post-test to the two samples to which the experiment was applied to find out if any of them present higher levels of achievement in the production of argumentative texts, shows that there

are no significant differences between them with U of Mann Whitney = 305,000 with pvalue = 0.869> 0.05, showing that the previous test had no effect on the treatment, concluding that the program was successful.

Table18: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Macroestructura	Aula B	25	26,10	662,50	U de Mann-Whitney=297,500
	Aula D	25	24,90	622,50	Z= -,405
	Total	50			P valor = ,686

Note. SPSS version 25

Finally, the comparisons made to the groups to which the experiment was not applied show that there are no significant differences in their achievement levels obtained with the Mann Whitney U test = 297,500 with p-value = 0.686> 0.05, demonstrating that the Non-application of the experiment in the control study groups does not influence their levels of achievement.

Therefore, it is concluded that: Virtual collaborative work significantly influences the macrostructure of argumentative texts in fourth year high school students of a public institution in time of COVID-19.

Specific hypothesis test 3

H_0 = Virtual collaborative work does not significantly influence the microstructure of argumentative text production in fourth-year high school students of a public institution in the time of COVID-19.

H_1 = Virtual collaborative work significantly influences the microstructure of the production of argumentative texts in fourth year high school students of a public institution in the time of COVID-19.

Table19: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Microestructura	Aula A	25	28,20	705,00	U de Mann-Whitney=245,000
	Aula B	25	22,80	570,00	Z= -1,638
	Total	50			P valor = ,102
Microestructura	Aula A	25	35,60	890,00	U de Mann-Whitney=60,,000
	Aula B	25	15,40	385,00	Z= -5,296
	Total	50			P valor = ,000

Note. SPSS version 25

The results show that both groups do not present significant differences in their levels of achievement, with Mann Whitney's U = 245,000 with pvalue = 0.102> 0.05, after the application of the experiment in the experimental group (Classroom A) improvements are evident significant in their achievement levels with respect to the control group (Classroom B) with U of Mann Whitney = 60,000 and p-value = 0.00 <0.05; This first comparison of the 2 samples with the control group allows us to know the degree of sensitivity of the pretest measurement if it truly influences the results of the experiment.

Table20: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Estadístico de prueba Kruskall Wallis
Microestructura	Aula A	25	71,50	Chi-cuadrado=58,813
	Aula B	25	32,98	Gl= 3

	Aula C	25	70,78	P valor = ,000
	Aula D	25	26,74	
	Total	100		

Note. SPSS version 25

The second statistic obtained was the Kruskall Wallis test in the four groups that present post-test, it was evidenced that there are significant differences between at least 2 groups of the sample, the groups in classroom A having higher values in their average ranges with 71.50 classroom C with 70.78, which shows that the program has had results in the applied groups, with the Kruskall Wallis statistic (chi square = 58.813 and with p-value = 0.000 <0.05.

Table21: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Microestructura	Aula A	25	25,10	627,50	U de Mann-Whitney=302,500
	Aula C	25	25,90	647,50	Z= -0,220
	Total	50			P valor = ,825

Note. SPSS version 25

The comparison of the post-test to the two samples to which the experiment was applied to know if any of them present higher levels of achievement in the production of argumentative texts, shows that there are no significant differences between them with U of Mann Whitney = 302,500 with pvalue = 0.825> 0.05, showing that the previous test has not had any effect on the treatment, concluding that the program was successful.

Table22: *Value of the Contrast Statistic*

	grupo	N	Rango promedio	Suma de rangos	**Estadísticos de prueba**
Microestructura	Aula B	25	27,50	687,50	U de Mann-Whitney=262,500
	Aula D	25	23,50	587,50	Z= -1,311
	Total	50			P valor = ,190

Note. SPSS version 25

Finally, the comparisons made to the groups to which the experiment was not applied show that there are no significant differences in their achievement levels obtained with the Mann Whitney U test = 262,500 with p-value = 0.190> 0.05, demonstrating that the Non-application of the experiment in the control study groups does not influence their levels of achievement.

Therefore, it is concluded that: Virtual collaborative work significantly influences the microstructure of argumentative texts.

CONCLUSIONS

FIRST: The virtual collaborative work significantly influences the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19, finding a significant difference between the achievement levels of the groups that present pretest with Mann Whitney's U = 60,500 and p value = 0.000 <0.005, in addition the significant difference of the 4 groups was evidenced in the post-test with Kruskall Wallis test = 58.600 with p value = 0.000 <0.05; Finally, the comparison between the groups that carried out the experiment confirmed that the previous test did not influence the results obtained with the Mann Whitney U test = 293,000 and p-value = 0.643> 0.05.

SECOND: The virtual collaborative work significantly influences the superstructure of the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19, finding a significant difference between the achievement levels of the groups that

present pretest with U of Mann Whitney = 56,500 and p value = 0.000 <0.005; In addition, the significant difference of the 4 groups was evidenced in the post-test with Kruskall Wallis test = 51.474 with p-value = 0.000 <0.05; Finally, the comparison between the groups that carried out the experiment confirmed that the previous test did not influence the results obtained with the Mann Whitney U test = 240,000 and p-value = 0.106> 0.05.

THIRD: The virtual collaborative work significantly influences the macrostructure of the production of argumentative texts in fourth year high school students of a public institution in the time of COVID-19, finding a significant difference between the achievement levels of the groups that present pretest with U of Mann Whitney = 69,500 and p value = 0.000 <0.005; Furthermore, the significant difference of the 4 groups was evidenced in the posttest with Kruskall Wallis test = 53.573 with p-value = 0.000 <0.05; Finally, the comparison between the groups that carried out the experiment confirmed that the previous test did not influence the results obtained with the Mann Whitney U test = 305,000 and p-value = 0.869> 0.05.

QUARTER: The virtual collaborative work significantly influences the microstructure of the production of argumentative texts in fourth year high school students of a public institution in time of COVID-19, finding a significant difference between the achievement levels of the groups that present pretest with U of Mann Whitney = 60,000 and p value = 0.000 <0.005; Furthermore, the significant difference of the 4 groups was evidenced in the post-test with the Kruskall Wallis test = 58.813 with p-value = 0.000 <0.05: finally, the comparison between the groups that carried out the experiment confirmed that the previous test did not influence the results obtained with the Mann Whitney U test = 302,500 and pvalue = 0.825> 0.05.

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