

ISSN 2063-5346



VIRTUAL LEARNING ENVIRONMENT IN THE COMPREHENSION OF ARGUMENTATIVE TEXTS IN STUDENTS

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Article History: Received: 01.02.2023

Revised: 07.03.2023

Accepted: 10.04.2023

Abstract

The objective of this research determines the degree of influence of virtual learning environment in the comprehension of argumentative texts in students of the private university pre-university center. The research had a quantitative approach, Applied descriptive descriptive type, correlational. The population consisted of 200 students of the university. For the variable 1, a survey was used in which the Likert scale was applied and for the variable 2, a survey with four tests and multiple choice questions was applied. These instruments had a high reliability of 0.972, with the Cronbach's Alpha statistical test, and 0.871 with KR20, respectively. The results obtained in the hypothesis testing with Spearman's Rho correlation coefficient were also favorable with 0.880. It was concluded that the Virtual Learning Environment significantly influences the Comprehension of argumentative texts in students.

Keywords: Virtual learning environment, comprehension of argumentative texts, online education, Information and Communication technologies, isolation due to the Covid-19 pandemic.

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DOI: 10.31838/ecb/2023.12.s1.062

Introduction

Societies need competent readers, with critical capacity, skilled builders of knowledge, which will enable them to improve the environment of which they are part. Unfortunately, the results of the evaluation of students in Peru are not favorable, as evidenced by the results of the PISA 2015 and 2018 test, since, even when a slight improvement (3.0) is observed between them, the levels are worrying: in PISA 2018, of the participating students, more than half (54.4 %) were in performance level 1 and 45.7 %, in levels 2 to 6, but with a higher concentration in levels 2 and 3. Consequently, the poverty in the levels of reading comprehension of academic texts is evident in the first semesters of higher education, since students only decode, i.e., they do not understand academic texts in depth (Sáenz Sánchez, B., 2018).

To this reality, in the year 2020, the isolation due to the pandemic established a context in which virtuality prevailed: the activities related to teaching and learning processes, including text comprehension, move their development to virtual learning environments, spaces in which the teaching and learning process is promoted through the use of Information and Communication Technologies, which makes the assimilation and distribution of contents easier, and promotes the adaptation of learning rhythms and the accessibility of learning tools without worrying about limitations in schedules or time availability, always based on a curricular program. In this way, the comprehension process can be carried out through a digital program that allows the student to make graphic organizers or answer questions asynchronously once the text has been read (Bellota Linares, K., 2021); likewise, a significant improvement in comprehension levels has been demonstrated with the use of virtual objects located in virtual learning environments in an LMS platform for learning in reading strategies, even when connectivity problems prevent some students from accessing the platforms (Torres, J. E. and Medina, D., 2020). The situation described in the preceding lines motivated the present research on the relationship between two variables: virtual learning environments and text comprehension.

The purpose of our research is to recognize the relationship between the virtual learning

environment and the comprehension of argumentative texts in students due to its special significance. Critical thinking guides thinking, doing and believing, because it favors reflection related to different aspects of reality and the ability to evaluate, analyze and refute arguments; therefore, the comprehension of an argumentative text becomes relevant, since it prepares students to search for information validated by evidence (Taborda & López, 2020; Aparicio-Gómez & Ostos-Ortiz, 2021). This article comprises three parts: first, the theoretical framework that allows us to support our study is presented; second, the research methodology is covered, where the type of design, the operationalization of variables, the means for hypothesis testing and the instruments used for data collection are pointed out; finally, in the third part, the statistical results are presented based on the hypothesis tests with Spearman's correlation coefficient, the discussion of the results and the conclusions.

Conceptual framework

The virtual learning environment is a space mediated by a curricular program that allows the creation and recreation of teaching and learning processes through the Internet in a learning management system, making possible the flexibility of time thanks to the fact that it can be synchronous or asynchronous, as well as space, since geographical chains are broken (Gonzales, 2014). The interaction between educational actors in this space allows them to appropriate information and communication technologies: teachers and students make use of the multiple didactic resources and have an inexhaustible source of documentary information that will propitiate such action (Ardila-Rodríguez, 2011; Holgado, 2016). In this way, the educational strategies designed by the teacher, whose purpose is to stimulate the student's potential or the development of certain competencies, are enriched (Reyes, 2016).

Clemente, Escribá and Buitrago (2010) and Holgado (2016) agree in stating that, in a virtual learning environment, the role of the teacher changes from the traditional role of transmitter of information to not only designing learning situations, but also accompanying the student, since he/she is a virtual tutor and counselor, since he/she possesses the knowledge not to transmit it literally, but to guide in its search and its relevant use. Likewise, Silva (2010) points

out that the role of the teacher implies his work as a motivator, in which he includes the guidelines that generate the student's commitment, as well as the monitoring of his performance, in addition to the incentive of reflection on his performance and the organization of what he has learned.

In order to make pedagogical processes viable in a virtual learning environment, teachers must not only possess pedagogical competence, i.e., mastery of the subject matter to be taught with a thorough review of the relevant knowledge and constant updating (Camacho, Lara, & Sandoval, 2015; Sierra, 2013; Torres, Badillo, Valentin, and Ramírez, 2014), they must also master the digital or informational competence, that is, the knowledge, capacity and ability related to the design, implementation, management and mediation processes of the virtual learning environment (Camacho, Lara and Sandoval, 2015 and Fernández, Reyes and López-Ornelas, 2021). This includes activities such as navigation, evaluation and management of information; timely communication and collaboration; creation of digital content, preservation of user security and resolution of problems that may arise in the aforementioned environments. Finally, the teacher's communicational competence becomes relevant, the ability in relevant oral and written communication, as well as the mastery of tools for synchronous and asynchronous communication in which assertive and timely communication that encourages individual or collaborative work activities is evident (Gonzales, 2014; Camacho, Lara and Sandoval, 2015).

As for the student, it is important to pay attention to his motivations. In virtual education, the student is responsible for searching, relating, ordering and commenting on the information that comes from various sources, which allows him/her to create knowledge; related to text comprehension, motivation activates the reader to discover alternatives that allow him/her to internalize the knowledge before, during and after reading through self-regulation and autonomous activity (Clemente, Escribá & Buitrago, 2010; Sierra, 2013; Holgado, 2016; Osorio & Sánchez, 2015; Reyes (2016).

The perception of text comprehension competence in students focuses on how

important it is to achieve this competence and how it will be useful in the professional environment, since it is not only related to the decoding of signs and their syntactic relationships, but also to interpret the relationship between them and the purpose of their structures (Fuenmayor & Villasmil, 2008; León, 2001; Núñez & Moreno-Núñez, 2017). On the other hand, communication and interpersonal relationships correspond to a relational competence of students with the teacher and with their classmates in virtual learning environments; in the first case, it is necessary that the teacher defines a communication with clear routes (whether this is synchronous or asynchronous), an assertive exchange and clear feedback to their progress, all this to feel free to point out their concerns or doubts in relation to the course; in the second case, the student must know the routes for this (networks, chat, etc.), establish work roles and agree on support groups (Sierra, 2013; Camacho, Lara and Sandoval, 2015; Holgado, 2016; Ardila-Rodríguez, 2011; Tünnermann, 2011).

The educational technology platform is a computer system, an operating system or *software* that hosts the virtual learning environment and facilitates the teacher to create, administer, manage and distribute various courses through the Internet (Bautista and Alba, 1997; Cabero, 1998; Holgado, 2016; Sanchez, 2005). For its satisfactory use, such environment must be kept stable, i.e., active and with digital educational resources available to the teacher and student; in addition, access must be easy, so that the assigned activities are performed (Sulmont, 2005). If these requirements are met, it is appreciated and worthy of respect, therefore, the student will suggest the use to their peers.

Text comprehension is a progressive and strategic process, in which the reader seeks the meaning of what he/she reads by interacting with the text: in this way, he/she establishes purpose, expectations and previous knowledge when reading, which strengthens objectivity when reading. In need of this, the reader develops a series of successive inferential phases that allow him/her to represent, inquire, relate, analyze and interpret the sense of what the text points out, constructing meaning (Solé, 2006; Pinzás, 2007; Cassany, Sanz & Luna, 2007; Jiménez, E., 2014; Sáenz, B.K., 2018;

Laredo, A., 2020 Bellota, K., 2021; Quigley, A., 2020). Related to the comprehension of argumentative texts, such process focuses on the exposition of the author's arguments that allow him to reaffirm his thesis (Dijk, T. van and Kintsch, W., 1978; Guerrero, J., 2017; Álvarez, G. and García, M., 2017).

The process of text comprehension is articulated in different phases and at different levels. Piacente, T. and Tittarelli, A.M. (2006), who bring together the ideas of Kintsch (1988, 1994) and van Dijk and Kintsch (1983), point out that, in a first phase, individual words and sentences are processed within the text, which they call superficial level or explicit comprehension; in a second phase, according to the basis of the text, the reader moves on to understand conceptual units with the recognition of the micro and macrostructure of the text, which corresponds to the inferential level or implicit comprehension, of interpretative level (Rocca, A., 2020; Laredo, A., 2020; Cortes, J.; Castañeda, J.G and Daza, J., 2019).

In an argumentative text, the author defends his position or opinion through a series of reasons, premises or supports (Morales, G.; Hernández, M.; Arroyo, R.; Pacheco, V. and Carpio, C.; 2014; Weston, A., 2006; Toulmin, S., 2003; Castillo, S. and Villanueva, M., 2017). First, the argumentative strategy of exemplification defends the thesis by means of one or several examples or particular cases representative of the idea to be supported; secondly, the argumentative strategy of analogy, compares the similarities between two elements, in which A is to B what C is to D, being these facts that keep the mentioned relation that allow defending an idea; thirdly, the argumentative strategy or rhetorical competence of causes implies the correlation of two facts; however, this correlation must be explained and must be the most probable among others. Finally, the discursive strategy of pragmatic argument supports the thesis from the favorable or unfavorable consequences with which the idea is defended (Toulmin, S., 2003; Weston, A., 2006; Serrano de Moreno, S., 2008; Castillo, S. and Villanueva, M., 2017).

Methodology

Our research is basic, substantive or pure, of descriptive level and the type of design used is non-experimental; in addition, it is cross-

sectional, since the information is collected at a specific moment in time. Within the aforementioned design, the subtype is correlational: in this, the analysis of the existing relationships between the study variables is made: variable 1 is the virtual learning environment and variable 2 is the comprehension of argumentative texts; the objective is to know the relationship or the degree of association between these variables in a certain context; this implies a process: first, the evaluation of the degree of association between the variables; second, the measurement of each of the variables and their presumed relationship; finally, the quantification and analysis of the link between them, through hypothesis testing (Esteban, 2018; Hernández S., R., 2006; Mejía M., E., 2008; Ñaupas, H. M., 2013; Hernández Gracia, J. F., 2018; Burgo Bencomo, O. B et al., 2019). The hypotheses seek to prove that the virtual learning environment is significantly related to the comprehension of argumentative texts in students of the Pre-university Center of the Ricardo Palma University. The study population consisted of a total of 200 students whose sample consisted of 132. Once the sample size was defined, the students were selected using simple random probability sampling.

The technique used was the survey. To measure the virtual learning environment variable, a 30-item questionnaire was used, grouped into three dimensions: teacher support, student motivations and information and communication technology, to which correspond, respectively, five indicators. The second instrument applied was a questionnaire to measure students' comprehension of argumentative texts. The questionnaire grouped two dimensions: explicit comprehension and implicit comprehension, with two and three indicators, respectively. The instrument consisted of four argumentative texts and twenty evaluation questions with multiple alternatives of which only one is correct and the rest are incorrect. The reliability of the virtual learning environment instrument is achieved by applying Cronbach's Alpha coefficient, given that the response scale of this instrument is Likert-type, while the Kuder Richardson coefficient was used for the argumentative text comprehension questionnaire, considering that its response scale is dichotomous with correct or incorrect alternatives. Since the internal

consistency coefficient at the variable level was 0.972 and in the dimensions it was greater than 0.871, this result shows that the reliability of both questionnaires is very good for their application. To test the hypotheses, Spearman's correlation coefficient was selected as a statistical technique, a statistical value that indicates the degree of correlation that exists between the study variables, appropriate for the treatment of ordinal variables such as the case of the variable reading comprehension of

argumentative texts, which was measured on a scale of 0 to 20.

Results and discussion

In the following lines, the frequency tables for each dimension will be presented together with a detailed descriptive analysis of each of the results. Then, the correlations that contrast the hypotheses are presented by applying Spearman's correlation coefficient.

Tabla 1.

Results of the virtual learning environment according to gender.

Contingency table V1. The virtual learning environment * Gender

			Genre		Total
			Female	Male	
V1. The virtual learning environment (VLE)	Inadequate	Count	10	6	16
		% within Gender	12,7%	11,3%	12,1%
	Improvable	Count	15	14	29
		% within Gender	19,0%	26,4%	22,0%
	Suitable	Count	54	33	87
		% within Gender	68,4%	62,3%	65,9%
Total	Count		79	53	132
	% within Gender		100,0%	100,0%	100,0%

Source: Own elaboration

For 65.9% of the students, the virtual learning environment has an adequate level, but 22% consider it to be improvable and 12.1% indicate

that it is inadequate. From the table above, we can see that there is not much difference in the answers according to gender.

Tabla 2.

Teacher support results by gender

Contingency table D1. Teacher support * Gender

			Genre		Total
			Female	Male	
D1. Teacher support	Inadequate	Count	12	8	20
		% within Gender	15,2%	15,1%	15,2%
	Improvable	Count	13	11	24
		% within Gender	16,5%	20,8%	18,2%
	Suitable	Count	54	34	88
		% within Gender	68,4%	64,2%	66,7%
Total	Count		79	53	132
	% within Gender		100,0%	100,0%	100,0%

Source: Own elaboration

Regarding the dimension Teacher support, for 66.7% of students, the level is adequate, while for 18.2% it is improvable and for 15.2% it is

inadequate. Observing the results of the indicators of the dimension, it can be highlighted that Pedagogical competence had

the highest percentage of inadequate, 18.2% of students; likewise, the Role of the teacher as motivator had the lowest percentage of Adequate among all indicators with 60%. The

rest of the indicators showed similar results, with the adequate level prevailing for 60 % and 65 % of students.

Tabla 3.

Results of Student Motivations according to gender

Contingency table D2. Student motivations * Gender

			Genre		Total
			Female	Male	
D2. Student motivations	Inadequate	Count	12	6	18
		% within Gender	15,2%	11,3%	13,6%
	Improvable	Count	16	15	31
		% within Gender	20,3%	28,3%	23,5%
	Suitable	Count	51	32	83
		% within Gender	64,6%	60,4%	62,9%
Total	Count		79	53	132
	% within Gender		100,0%	100,0%	100,0%

Source: Own elaboration

Regarding student motivation, 62.9% consider it adequate, while 23.5% consider it improvable and 13.6% of the students in the sample consider it inadequate. Among the indicators of this dimension, the low percentage of Interaction

with classmates (adequate for 46.2 % and inadequate for 19.7 %) and Communication and interpersonal relations (adequate for 52.3 % and inadequate for 15.2 %) stand out.

Tabla 4.

Information technology results by gender

Contingency table D3. Information technology * Gender

				Genre		Total
				Female	Male	
D3. Information Technology	Inadequate	Count		8	5	13
		% within Gender		10,1%	9,4%	9,8%
	Improvable	Count		18	16	34
		% within Gender		22,8%	30,2%	25,8%
	Suitable	Count		53	32	85
		% within Gender		67,1%	60,4%	64,4%
Total	Count			79	53	132
	% within Gender			100,0%	100,0%	100,0%

Source: Own elaboration

The results in the Information Technology dimension show that the level is adequate for 64.4% of students, while for 25.8% it is improvable and for 9.8% it is inadequate. The indicator with the lowest favorable result is the Practical value of the educational technology

platform, which is only adequate for 46.2 % of the students, while for 37.1 % it is improvable and for 16.7 % it is inadequate. Another indicator with a high percentage of inadequate is Easy access to the virtual learning environment, with 14.4 % of disapproval.

Tabla 5.*Reading comprehension results of argumentative texts by gender***Contingency table V2. The Reading comprehension of argumentative texts * Genre**

			Genre		
			Female	Male	Total
V2. Reading comprehension of argumentative texts	Under	Count	13	7	20
		% within Gender	16,5%	13,2%	15,2%
	Medium	Count	27	20	47
		% within Gender	34,2%	37,7%	35,6%
	High	Count	39	26	65
		% within Gender	49,4%	49,1%	49,2%
Total	Count		79	53	132
	% within Gender		100,0%	100,0%	100,0%

Source: Own elaboration

Forty-nine.2% of the students showed a high level of comprehension of argumentative texts, while 35.6% were at a medium level and 15.2% showed a low level of comprehension. In the comparison by gender, similarity was observed

in the percentage of high level, while, in the low level of comprehension, the percentage in female students of 16.5 % is slightly higher than that of male students with 13.2 %.

Tabla 6.*Explicit Comprehension Results by gender***Contingency table D1. Explicit comprehension * Gender**

			Genre		
			Female	Male	Total
D1. Explicit understanding	Under	Count	9	6	15
		% within Gender	11,4%	11,3%	11,4%
	Medium	Count	19	14	33
		% within Gender	24,1%	26,4%	25,0%
	High	Count	51	33	84
		% within Gender	64,6%	62,3%	63,6%
Total	Count		79	53	132
	% within Gender		100,0%	100,0%	100,0%

Source: Own elaboration

Regarding explicit comprehension, a higher percentage of comprehension was observed in both males and females, and in total 63.6% of the students showed a high level, while 25% showed a medium level and only 11.4% were at a low level. these percentages did not differ significantly in the measurement by gender.

In relation to the indicators of the Implicit Comprehension dimension, we observed favorable results, due to the fact that around 64% reach a high result: 68.9% satisfactorily recognize the main idea and 65.9% the argumentative strategy of exemplification; however, it is important to note the results of 30% and 34% of young people who do not reach the respective dimensions.

Tabla 7.*Implicit comprehension results by gender***Contingency table D2. Implicit understanding * Gender**

			Genre		
			Female	Male	Total
D2. Implicit understanding	Under	Count	20	14	34
		% within Gender	25,3%	26,4%	25,8%
	Medium	Count	29	19	48
		% within Gender	36,7%	35,8%	36,4%
	High	Count	30	20	50
		% within Gender	38,0%	37,7%	37,9%
Total	Count		79	53	132
	% within Gender		100,0%	100,0%	100,0%

Source: Own elaboration

Finally, with regard to implicit comprehension, a lower percentage of students with a high level (37.9 %) was observed with respect to explicit comprehension. While 36.4 % showed a medium level and 25.8 % a low level. This result evidences greater difficulty on the part of the students when answering implicit comprehension questions in argumentative texts.

In the values related to the indicators of the Implicit Comprehension dimension, the indicator with the highest percentage of correct answers (which denotes a high level) is the pragmatic argument inference (56.10 %); the argumentative strategy of causes and that of

analogy have 45.5 % and 41.7 %, respectively, this implies a greater difficulty when the student must recognize the causes of a fact or situation and the comparison of the same.

In relation to the hypothesis test, the Spearman coefficient of 0.880 shows that the relationship between both variables is strong, that is, when the virtual learning environment is adequate, the level of Comprehension of argumentative texts is high, while when the virtual learning environment is inadequate, the level of comprehension of argumentative texts is also low in the students, which is also verified for each of the dimensions.

Tabla 1.

Correlation between the virtual learning environment and the comprehension of argumentative texts.

V2. Comprehension of argumentative texts			
	Rho Spearman	N	Sig. (bilateral)
V1. The Virtual Learning Environment	0,880	132	0,000

Discussion of results

The analysis of the information collected in the fieldwork of our research presents several results of interest, which are contrasted with other similar studies. Although the research by Bellota Linares, K. (2021), Torres, J. E. and Medina, D. (2020), Sáenz Sánchez, B. (2018) and the study by Mercado Borja, W. E., Guarnieri, G. and Rodríguez, G. L. (2019) are of experimental or quasi-experimental design, it is necessary to point out that ours differs in that the

context of isolation made it difficult to design a different design for the study. On the other hand, several of the mentioned investigations use a program or a standardized test to measure the level of comprehension; the development of our instruments constitutes a contribution to the evaluation of comprehension levels.

In relation to the teacher support dimension, several researches agree on the need for a methodological design, as well as the resources that facilitate the teaching and learning process,

likewise, they place relevance on teacher training in the mentioned environments (Pastora Alejo, B., and Fuentes Aparicio, A., 2021; Orostica Verdugo, K., 2020), and in the promotion of research (Vega Lebrún, C.; Sánchez Cuevas, M.; Rosano Ortega, G. and Amador Pérez, S. (2021). Although the favorable results of our research in relation to this dimension are not low (higher than 60%), teacher competence in their instruction on the comprehension of argumentative texts does not show high satisfaction (around 64%): the teacher must demonstrate his competence, which means identifying the arguments (thesis or position and support); therefore, a poorly explained support or an unclear example can mean frustration for the student; likewise, the role of the teacher as motivator had a lower percentage of adequate among all indicators, so it is necessary to consider the context of the facts in the analysis of the results: the sample is collected during the second year of compulsory isolation (2021), the teacher has already acquired tools for interaction with his students, but not all of them participate or their answers are monosyllabic or not very precise, since they depend on writing through the chat, which takes time, since the students are concerned about the correctness of their short texts, as well as to be understood. Let us not underestimate that the students, under certain order, could open their microphones, but the home context, which in many cases does not have an environment suitable for study or participation in class, made the student's intervention in the debate less possible.

In our study, the student motivations dimension stands out for its negative results in interaction with peers and interpersonal communication and relationships. Although students do group work, there is a high percentage that connects to the session with the objective of ensuring that they are considered present in the class, but they find themselves doing other activities and leave unanswered the consultation of classmates when they are gathered in teams; in addition, it must be considered that students see each other as competitors in search of a vacancy, which may distort the perception of their interest in developing group activities in which they share their findings and debate on the authors' positions; also, their relationship with the teacher depends on the mood to ask the question: they must be sufficiently clear when

writing it down or accepting the teacher's cross-examination and they must overcome shyness or insecurity in the exposition of ideas before their peers in the virtual environment.

The results in the information technology dimension show that the indicator with the lowest favorable result is the practical value of the educational technology platform. The items are focused on the student's perception of its added value, in the sense of whether the dynamics of text comprehension is better in the virtual learning environment or whether such practice is better in the face-to-face environment; the results show that a large percentage of students do not consider it as a significant change. Likewise, another indicator with a high percentage of inadequate is the easy access to the virtual learning environment, a result that can also be explained by an external factor: the need to conduct classes virtually made many homes improvise the means of access; because of this, even with the *hardware* and *software* recommendations of the study house, some students did not have equipment that met these basic requirements or an optimal Internet signal for interaction in the digital space. Despite the above, as in other research (Maldonado Chávez, C.A., 2018; Torres, J. E. and Medina, D., 2020), students consider of adequate level the variable the virtual learning environment.

Finally, the high level of comprehension of argumentative texts reaches the highest percentage, although it is only close to 50%: explicit comprehension reflects a higher percentage of comprehension at the high level; implicit comprehension, a lower percentage of students with a high level. This result shows greater difficulty on the part of students when answering implicit comprehension questions in argumentative texts, especially when it comes to recognizing causal and analogical relationships. This coincides with the study of Sáenz Sánchez, B. (2018), who finds a considerably lower level of text comprehension in the students he evaluates, characteristic of young people who are beginning a university education.

Conclusions

Statistical analysis showed that the virtual learning environment is significantly related to the comprehension of argumentative texts;

likewise, similar significance was verified for the dimensions.

It is important to emphasize the importance of the exercise of comprehension of argumentative texts in university students and its possibilities in a virtual learning environment, as well as the importance of monitoring the activities in order to observe and make the necessary corrections, if this were the case. In addition, it is relevant to implement different programs aimed at improving the level of comprehension of argumentative texts of students in order to improve their critical thinking, a fundamental element for their university work; It is also important to train teachers in pedagogical strategies oriented to the formation of good habits of text comprehension in students and in the use of new technologies, in order to improve pedagogical and digital competence, respectively; finally, to inform about the need to guarantee Internet access and adequate equipment for students in order to ensure their participation in the teaching and learning processes in virtual learning environments.

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