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Developing Critical Thinking Skills: The Impact of Teaching Strategies in a Writing Course for Communication Students

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EN | Abstract:
This research aimed at determining the incidence of the application of teaching strategies in the development of critical thinking skills in students of the subject Writing Styles majoring in communication at Universidad Don Bosco. Using a quasi-experimental design, the critical thinking skills of two groups of students were measured before and after the treatment applied to the experimental group. Such treatment consisted in the implementation of activities focused on developing critical thinking as a central aim of the selected writing course. The critical thinking skills considered in this study were: reasoning, problem-solving, and decision-making. The results revealed a positive impact of the application of the teaching strategies by significantly increasing their interest in expressing value judgments and solutions to social problems. Teachers should explicitly implement teaching activities to foster critical thinking in educational environments.

Keywords: *Critical Thinking, Higher Education, Communication, Teaching Strategies, Writing, SDGs, SDG 4, SDG 10.*

ES | Abstract:
Esta investigación tuvo como objetivo determinar la incidencia de la aplicación de estrategias didácticas en el desarrollo de habilidades de pensamiento crítico en estudiantes de la asignatura Estilos de Escritura de la carrera de Comunicación de la Universidad Don Bosco. Utilizando un diseño cuasi-experimental, se midieron las habilidades de pensamiento crítico de dos grupos de estudiantes antes y después del tratamiento aplicado al grupo experimental. Dicho tratamiento consistió en la implementación de actividades enfocadas a desarrollar el pensamiento crítico como objetivo central del curso de escritura seleccionado. Las habilidades de pensamiento crítico consideradas en este estudio fueron: razonamiento, resolución de problemas y toma de decisiones. Los resultados revelaron un impacto positivo de la aplicación de las estrategias de enseñanza al aumentar significativamente su interés por expresar juicios de valor y soluciones a problemas sociales. Los profesores deberían implementar explícitamente actividades de enseñanza para fomentar el pensamiento crítico en los entornos educativos.

Palabras Clave: *Pensamiento crítico, Educación Superior, Comunicación, Estrategias de enseñanza, Escritura, ODS, ODS 4, ODS 10.*

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I.INTRODUCTION

Educational systems have the goal of developing the most of each person's capacities, which implies, among others, the enhancement of thought and communication (Sanz and Serrano, 2017). The achievement of this goal results in citizens who contribute to the solution of the society's problems from their diverse contexts.

Faced with this, reading and writing texts in different disciplines are crucial activities that favor students' abilities to participate in the construction of democracy in modern society through the mastery of written code of a variety of legal, administrative, scientific, literary, and journalistic texts (Franco, 2011). Society is governed by language, and it is necessary to understand texts to be active participants in democracy. However, in the practical sense, responding to issues of situations related to the society through oral and/or written communication, whether by consuming or producing texts, requires an optimal level of critical thinking, which should be potentialized in higher education institutions.

In theorical terms, to reach a standard definition of critical thinking by the diverse authors has been difficult. On one hand, some refer to critical thinking as an ability to consider that there are other points of view, to accept evidence that is not necessarily in line with what we believe, to reason without passions and to deduce answers based on tangible facts (Willingham, 2008). Benavides and Ruíz (2022) add to the previous ideas, the ability to observe, analyze, interpret, argue, and express a position regarding any given situation.

On the other hand, critical thinking has been defined from a more integrative stand. Ossa et al. (2017) consider the development of both cognitive and metacognitive abilities to generate self-regulation and motivation to develop critical positions that lead to make decisions to solve the social problems. This way to consider critical thinking had already been proposed by Halpern (1998), who suggested an integrated system of the following four components for a learning process that stimulates critical thinking:

1. The establishment of conditions that prepare the learner for hard cognitive work.
2. Specific instruction in critical thinking skills.
3. Training in the structural aspects of problems and discussions to promote transcontextual transfer of critical thinking skills.
4. Metacognition to check accuracy and monitor progress toward the goal.

In a more general way, the learning system requires a teacher who is empathetic, participatory, and critical of himself, together with an equally active, receptive, and adaptable student.
Inspired by Halpern, Saiz (2008) reformulated the role of the conditions (to which he calls "attitudes") and the motivation in its relation to the critical thinking abilities. Saiz points out three abilities as the nucleus of the critical thought: the reasoning, the problem solving and decision making, and adds motivations and meta-knowledge as part of his scheme to explain

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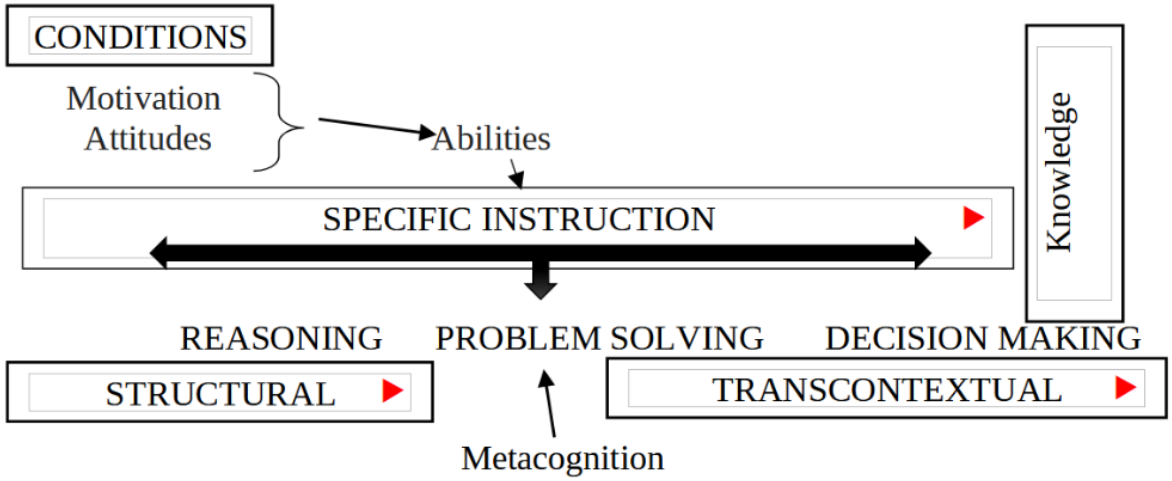
the process in which critical thinking emerges in the individuals. He defines the latter, meta-knowledge, as the kind of knowledge that allows us to manage, organize and plan our skills profitably and act once the capacities have started to work. That is, a form of knowledge where the person reflects about the efficiency of his acts and works towards the improvement of his abilities. Thus, both Halpern (1998) and Saiz (2008) assert that self-regulation is crucial when it comes to the development of critical thinking (See Figure 1).

Figure 1: Components of Critical Thinking Learning Process



Note. Own elaboration based on Halpern, D. F. (1998). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring and Saiz, C. (2008). Evaluación en pensamiento crítico: Una propuesta para diferenciar formas de pensar.

Strategies Implemented To Develop Critical Thinking

Various investigations have been carried out seeking to analyze the development of critical thinking in educational environments. These studies go from those examining the students' conceptualization of critical thinking to those which describe the results of implementing strategies to develop this ability. Regarding the conceptualization of critical thinking, Fedorov (2008) conducted a study using a virtual forum to develop critical thinking abilities with students at the Technological Institute of Costa Rica.

As a result, the participants refined their conceptualization of critical thinking by adding elements of motivation and self-regulation to reach the highest levels of competence development, indicating the usefulness of electronic methods for developing the target abilities. More recently, the study by Andreu and García (2014) focused on the participants' perspective on conceptualizing and experimenting with the application of critical thinking.

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The findings of this study showed that, even without a frame of reference, young people usually relate critical thinking with characteristics such as creativity, originality, analysis, and fluency in oral communication.

Concerning the results of implementing teaching strategies to develop critical thinking, Gokhale (1995) evaluated the process of critical thinking training in various subjects and applying different methods. Their results showed that collaborative learning methodologies favor critical thinking in contrast to individual learning environments. Similarly, Cobos et al. (2021) proved the effectiveness of debates to increase the interaction among students which resulted in improvements in the critical thinking ability; this was also demonstrated by Mindiola and Castro (2021) who stimulated the students' participation in classes to enhance their critical thinking capacity. Another strategy that has evidenced positive results is the case studies (Morales & Díaz, 2021) as it promotes the active learning and the generation of ideas to solve the problematic situations under analysis. Finally, Quintero et al. (2021) demonstrated that the methodology known as problem-based learning fosters the development of critical thinking as it allows students to propose contextualized solutions and decisions to obtain effective outcomes.

Despite the wide range of studies that report the results of the strategies being implemented to develop critical thinking, the research that proves the effectiveness of such strategies is scarce, especially in Latin American higher education contexts. Some of these studies worth mentioning are Reed (1998) inquired about the effect of intensive training in critical thinking of students in community colleges in Florida. He applied the intensive method of the critical thinking model of Paul and Elder (1997), which divided reasoning in different subcategories: elements of reasoning, standards of reasoning, qualities of reasoning and skills. With this, an experimental methodology of control group and experimental group was developed to observe the possible effects of a central aim of the course programs. Reed concluded that the intensive training led to improvements in historical and critical thinking. Another study is reported by Tabares et al. (2019). It consisted of a quasi-experiment with one single group of psychology university students. They completed a pre and a post-test of critical thinking. The measurements were carried out before and after a six sessions intervention program in which the students were trained to hold a critical debate in a public end-of-the-program event. The researchers concluded that the critical debate methodology favors the development of critical thinking.

Certainly, the literature shows efforts to develop critical thinking in diverse classroom contexts, yet it is still missing studies related to the development of critical thinking skills in a subject that seeks to develop writing and argumentation skills in the field of communication. Thus, the purpose of this study is to contrast a teaching methodology that presupposes the development of critical thinking with another teaching methodology that explicitly handles it as a central aim of the course program.

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In other words, it is intended to contrast the development of critical thinking in students who are trained to read with analytical awareness current socially relevant content, while working on the development of writing skills and those who do not receive such specific type of training.

This research intends to contribute to the effort to understand the development of critical thinking in connection to strategies, behaviors, and attitudes through the work with the critical thinking components (i.e., reasoning, problem solving, and decision making according to Saiz, 2008) as a central aim of a written communication course program. Thus, it is expected to identify those procedures that are suitable to develop these abilities in the teaching context and to evaluate a viable alternative to strengthen the critical thinking skills of the students of the course Writing Styles.

II. METHODOLOGY

Design

The present investigation has been carried out under a quantitative approach, following a non-equivalent control group design with intact quasi-experimental groups (Zechmeister et al., 2001). The aim was to verify if the strategy of implementing a central aim in the course program that develops cognitive skills of analysis, decision making and problem solving impacted the development of critical thinking of students of the subject of Writing Styles of students majoring communication at Universidad Don Bosco, a private Salvadoran institution. To this end, two measurements were made to both groups, namely control and experimental groups. The design of the experiment can be represented as follows:

$$O_1 \; X \; O_2$$

$$O_1 O_2$$

The dotted line indicates the quasi-experimental nature of the design since the experimental group and the control group could not be randomly selected. Rather, we worked with intact groups, that is, they were formed prior to the start of the experiment due to the enrollment process carried out by the university. The group on the dotted line received the treatment (X) after completing the first measurement (O1) and completed a second measurement (O2) after receiving treatment; contrary to the control group that completed both measurements, but without receiving any treatment (Zechmeister and others, 2001).

Participants

On one hand, the central aim of the course program was implemented with a class group of 28 students of the course Writing Styles, which is taught in the fall semester of each year to junior students; this one served as the experimental group. The central aim of the course program was designed to cultivate critical thinking through the development of cognitive skills in reasoning, problem solving, and decision making based on Saiz's model (2008). The Writing Styles course lasted 16 weeks. Approximately 75% of the total of the sessions had the central aim incorporated for 40-60 minute out of the 120 minutes which lasted the whole class session.

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On the other hand, the control group consisted of 23 students from a parallel section of the course. Unlike the experimental group, these students did not receive any of the phases of the critical thinking central aim of the course program. So that the students studied the course as it is normally projected, without any of the discussion, argumentation, and reading activities to develop critical thinking that the experimental group received; to contrast the results in the development of critical thinking of students who received the cross-cutting component of critical thinking with those who did not receive it.

Hypotheses and Variables

With the above, the hypothesis of the proposed research assumed that the application of the critical thinking central aim would have a positive impact on the development of critical thinking skills of the students who received it along with their Writing Styles course. This component was designed by integrating a series of activities to encourage discussion, problem solving, analysis of arguments and sources of information, that is, critical thinking skills. Therefore, the research hypothesis and the null hypothesis, as well as the corresponding research variables used, can be stated as follows:

Hypothesis1. There are differences in the development of critical thinking skills of students who work with teaching activities to promote discussion, value judgments, solutions to various social problems proposals, analysis of sources, and argumentation through a critical thinking central aim of the course program, in contrast to a group of students who do not perform these activities.

Hypothesis0. There are no differences in the development of critical thinking skills of students who work with teaching activities to promote discussion, value judgments, solutions to various social problems proposals, analysis of sources, and argumentation through a critical thinking central aim of the course program, in contrast to a group of students who do not perform these activities.

Dependent variable. Development of critical thinking expressed in an average score resulting from the diagnose and final measurements of the three critical thinking skills according to Carlos Saiz (2008): reasoning, problem solving, and decision making. These were evaluated according to a rubric that included the three skills and assigned scores for each from which the general average of Critical Thinking was calculated.

Independent variable. Teaching strategies for the promotion of discussion, value judgments, problem solving, analysis of sources, and argumentation through a constant course program component of critical thinking. As explained, it is intended to observe the effects on the level of critical thinking development by integrating discussion activities for different topics, and including activities that involve the use of analysis, argumentation, and problem-solving skills.

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Instruments and data collection procedure

Pretest. At the beginning of the course, a diagnostic test created by the research team was applied. This test was based on the elements described within the theoretical framework of critical thinking skills, according to the model of Saiz (2008): reasoning, problem solving, and decision making. The diagnostic test consisted of presenting a text for reading and analysis and questions that sought the application of the aforementioned skills.

Regarding the assessment of the test, a rubric created by the Student Learning Assessment Office of the University of Puerto Rico at Río Piedras was adapted (Cordero et al., 2015). The rubric integrated the following criteria, which was in accordance with the conceptualization of our research: information analysis, application of procedures, presentation of solutions, presentation of conclusions, and synthesis of ideas. In addition, the rubric included identification and characterization of arguments, as well as evaluation of information media. The nature of the activities of the Writing Styles course demanded an assessment instrument focused on arguments, analysis, and selection of sources. Thus, this rubric served well for the purposes of this study.

The pretest was piloted with a group of 30 students, similar to the target population of the research, addressing the issue of abortion. First, they were asked to write their opinion about it; afterwards, the teacher read a story about a specific case of abortion in the country; and then they were asked to write, according to what they had just heard, the main ideas of the possible solutions to the situation of abortion in the country.

As a result of this pilot-test, two modifications were taken in consideration for the control and experiment groups. First, it was decided that each student would read the test individually, instead of the teacher reading it. In this way, we tried to avoid some type of incidence or connotation when reading aloud, as well as to facilitate the visualization of the text and the direct contact with the ideas in a more punctual way. Second, in addition to describing their position on the subject of the written text, the participants were asked to add background knowledge regarding the topic being discussed.

After these modifications, the pretest was applied to the control group and the experimental group at the beginning of the subject, to check the level of development of the three skills: reasoning, problem solving, and decision making. The test was administered during the second week in their corresponding class schedules to ensure that the conditions of the quasi-experimental design were kept constant for both groups (Zechmeister et al., 2001).

Post-test. The test administered at the end of the treatment was equivalent in structure, questions, and sample text extension and type of topic without representing a replica of the sample text used in the diagnostic test.

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In this way, the final evaluation was developed to observe changes in the critical thinking skills of the students of both groups, and to discover whether the implementation of the central aim of the course program had had a significant impact on the development of critical thinking in the experimental group contrasted to the control group, in which the treatment was not implemented.

Implementation Of The Central Aim

Throughout the semester, the central aim of critical thinking was implemented in the experimental group by integrating it into the methodology of classes in three phases applied in each one of the units of the subject, so that the course program was completely covered (See Figure 2 for the detailed phases and Figure 3 for the integration of the central aim to the course program). The implementation of the component was carried out by one of the researchers, who at the same time was the teacher in charge of the three groups used in the present study (the pilot test group, the control group, and the experimental group). At the end of the implementation of the three phases and on the last week of the semester, the post-test was applied to both groups during their corresponding class schedules.

Figure 2: Phases of the Central Aim of the Course Program

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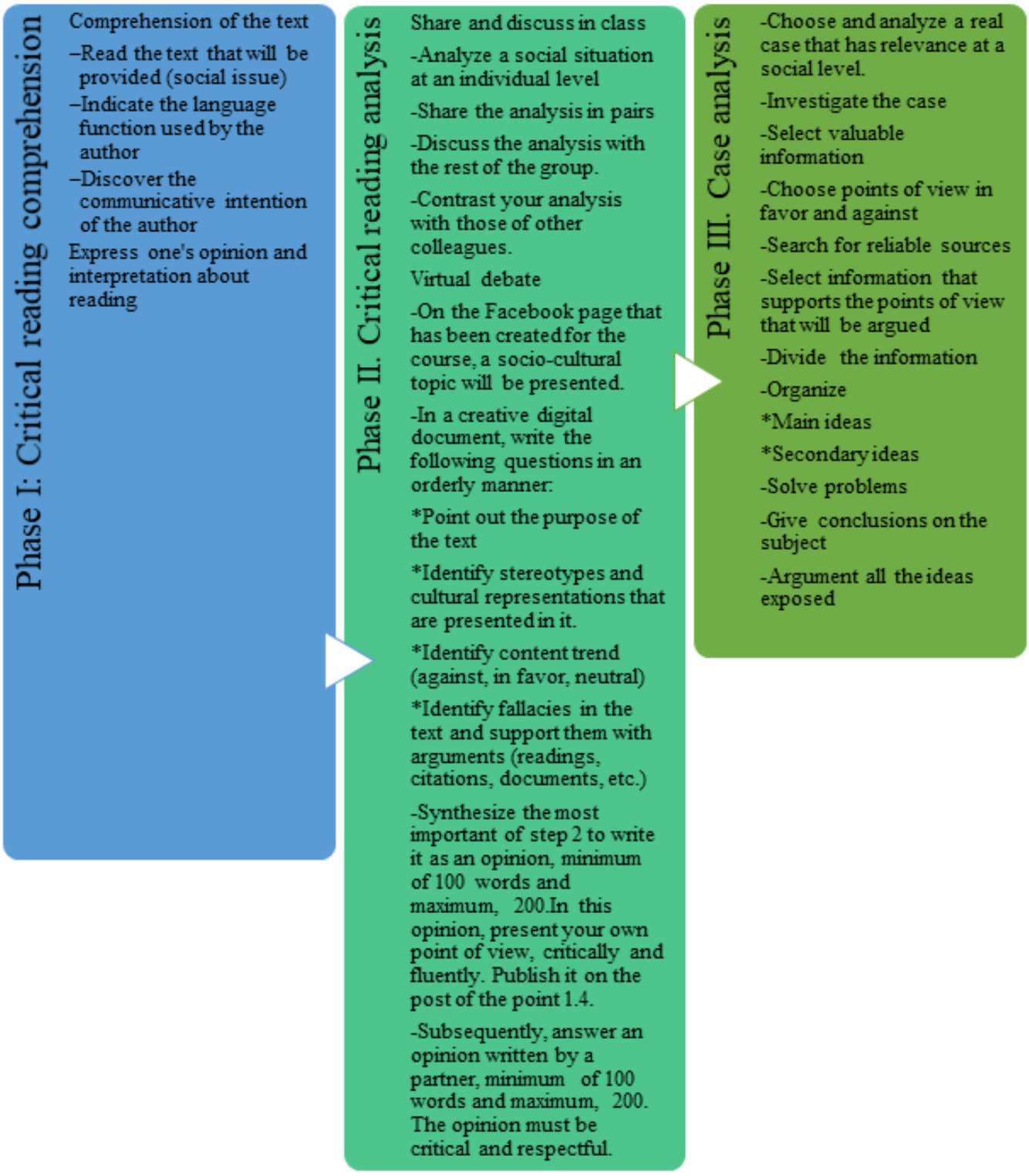

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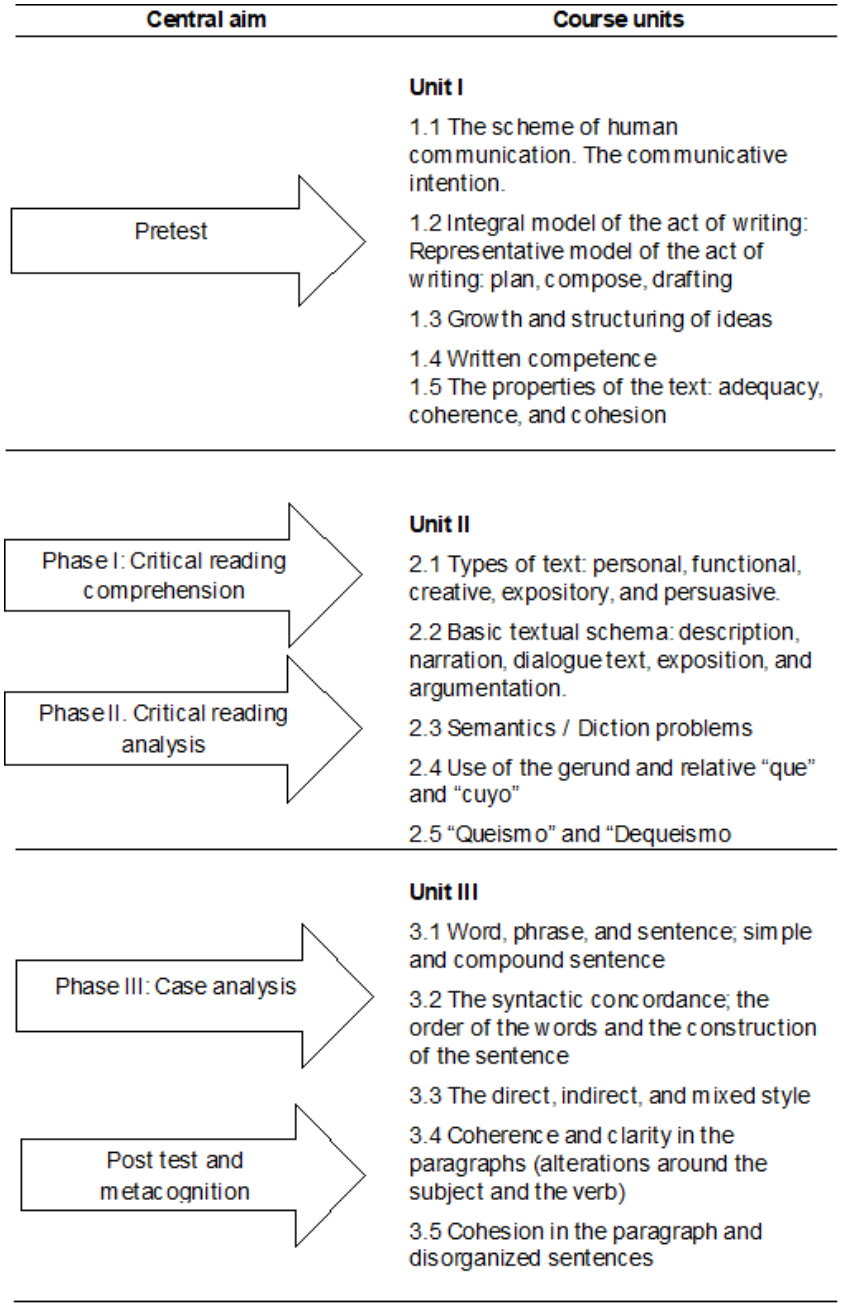
Figure 3: Central Aim Integrated to the Writing Styles Course Program



Regarding the metacognitive process, this was added at the end of the implementation of the component, following the process of development of critical thinking of Saiz (2008), who claimed that metacognition is a key element in development of critical thinking. It was decided to do it at the end of the semester, so that the students would have better awareness of their own learning process and understanding of the need to develop critical thinking for their personal and academic life than at the beginning of the course. Also, it was decided not to perform a metacognitive process with the control group as this group lacked the central aim intervention.

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The metacognition questions were specifically created for this research based on the concepts by Huertas et al. (2014) who classified metacognition in two perspectives, namely, knowledge of cognition and regulation of cognition. According to them, while metacognition implies to know how, to know about, and to know why, at the same time the student needs to recognize the things that can affect their learning, resources, and strategies. The guiding questions for this metacognition process were applied to the experimental group at the end of the semester and are detailed in Table 1.

Table 1: Metacognition Guiding Questions for the Experimental Group

Aspect	About the activities	About the course
Knowledge of cognition	**Know about**	
	-Does any factor influence my personal responses? -What elements can affect my analysis of a reading? -How do I sustain my answers?	-What have I observed about my way of presenting my opinions on a topic? -What factors do I consider affect my way of thinking and opinion? -What have I observed in my way of arguing?
	Know how:	
	-What guarantees did I make good analysis of a text?	-What are the characteristics of my analysis when developing the activities of the course?
	Know why and when:	
	-What kind of thought processes did I use to address the questions?	-About my way of working Why do I do it that way? And when is it wise to do it?
Knowledge regulation	**Planning:**	
	-Have I met my learning objectives during the course? How and why?	-Have I met my goals for this course? How and why?
	Monitoring:	
	-How useful were the reading and questioning activities?	-What use can reading activities and questions have?
	Evaluating:	
	-What have I learned from the activities? -Do I consider that I have responded adequately to the activities that were presented to me? Why?	-What did I learn from this course? Do I think I have developed the course well? Why?

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Data processing

Once the tests were completed, the participants' writing was assessed through the previously established rubric. The data obtained from the two measurements (pretest and post-test) were processed using spreadsheets in the Google Sheets platform to facilitate the exchange of information, protect the record with storage in Google Drive and process information for calculations and statistical evaluation.

It may be argued that this type of methodological design is susceptible to external factors which may affect its validity. However, to ensure the validity of the design, certain considerations were taken by the research team. First, to avoid interferences in the results, guarantee equivalence in the conditions of both groups, and protect the results of the "Subjects Mortality" (Zechmeister et al., 2001, p. 242), it was decided to use for the analysis only those results from students in both the experimental and the control group who took both measurements. Thus, ensuring that the final findings were made with participants evaluated throughout the process.

Second, to avoid the influence that the teacher researcher could have on the students of the treatment (Cook & Campbell, 1979), none of the groups was mentioned on the intended contrast so that the normal performance of the students was not altered. In addition, all the tests were of different topics to evade the familiarity of students with the nature of the test, and the test were administered at the beginning of the corresponding days reducing interference or distractions, which enhanced constant conditions for the test environments. Additionally, both tests, pre and post, were assessed by the members of the research team external to the teaching process.

III. RESULTS

The pretest was completed by a total of 72 students, 31 in the control group and 41 in the experimental group. Subsequently, 23 students in the control group and 28 in the experimental group completed the post-test, being these 51 students the ones who completed successfully both pre and post-tests. Of these, 41% were men and 58% women. The participants were junior students of the degree in Communications and Multimedia Technician, registered for the first time in the course Writing Styles. Both tests - pre- and post- contemplated three main critical thinking skills: reasoning, problem solving, and decision making, which were rated through a four-level rubric: Excellent (7.6-10), Satisfactory (5.1-7.5), In process (2.6-5) and Novice (0-2.5). From these three elements an average score was calculated after adding the scores obtained in each skill individually.

Pretest results

The pretest confirmed the equivalence of the groups despite not being randomly selected. It is true that the averages of the groups were different (see Figure 4), yet the t-student test shows that such difference was not significant. The analysis was executed in Google sheets and a significance level of $\alpha = 0.05$ was established. Table 2 details this data.

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Figure 4: Pretest Average Score for Control and Experimental Group

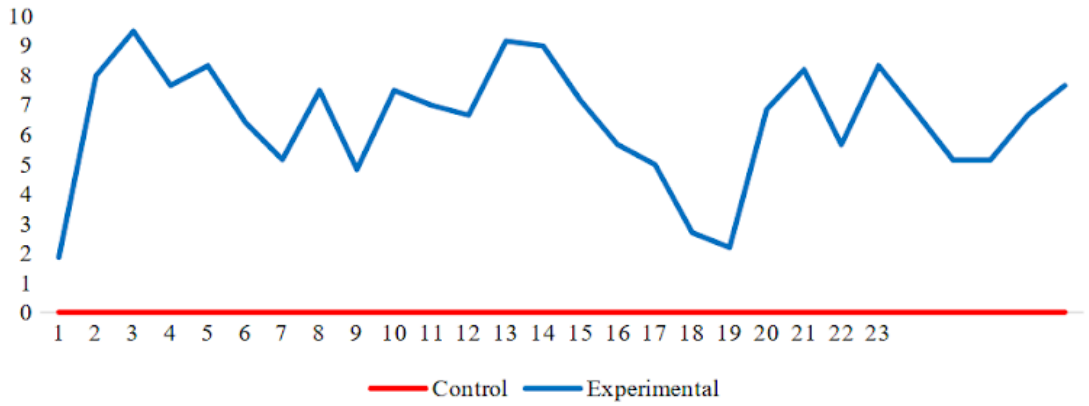

Table 2: t-student Test for the Pretest of Control and Experimental Groups

	Control	Experimental
Mean	5,75362319	6,4952381
Variance	7,38805446	3,92787772
Observations	23	28
Grouped variance	5,48142646	
Hypothetical difference of the means	0	
Degrees of freedom	49	
Statistic t	-1,12561404	
P (T <= t) one tail	0,13290604	
Critical value of t (one tail)	1,67655089	
P (T <= t) two tails	0,26581208	
Critical value of t (two tails)	2,00957524	

As observed in the Pretest data, both groups show a similar performance level within their satisfactory range; 5.75 for the control group and 6.49 for the experimental group. Despite this difference, the statistical test shows that the P value between both groups is 0.13 and 0.26, is greater than 0.05, so it can be interpreted that there are no significant differences. This implies that both groups can be considered statistically similar at the time of carrying out the pretest.

Post-test results

The post-test in both groups indicated the following results: most students of the control group scored in the Excellent (10) and Satisfactory (9) levels, leaving a minority still assessed in Process (3) and Novice (1) levels. In contrast, the experimental group scored in Excellent level (25) and only three students reached the Satisfactory level. In that sense, there are again patterns of difference in the averages of both groups (See Figure 5). This time the t-student test showed that the difference in the averages of the post-test between the two groups was significant. Table 3 presents this data.

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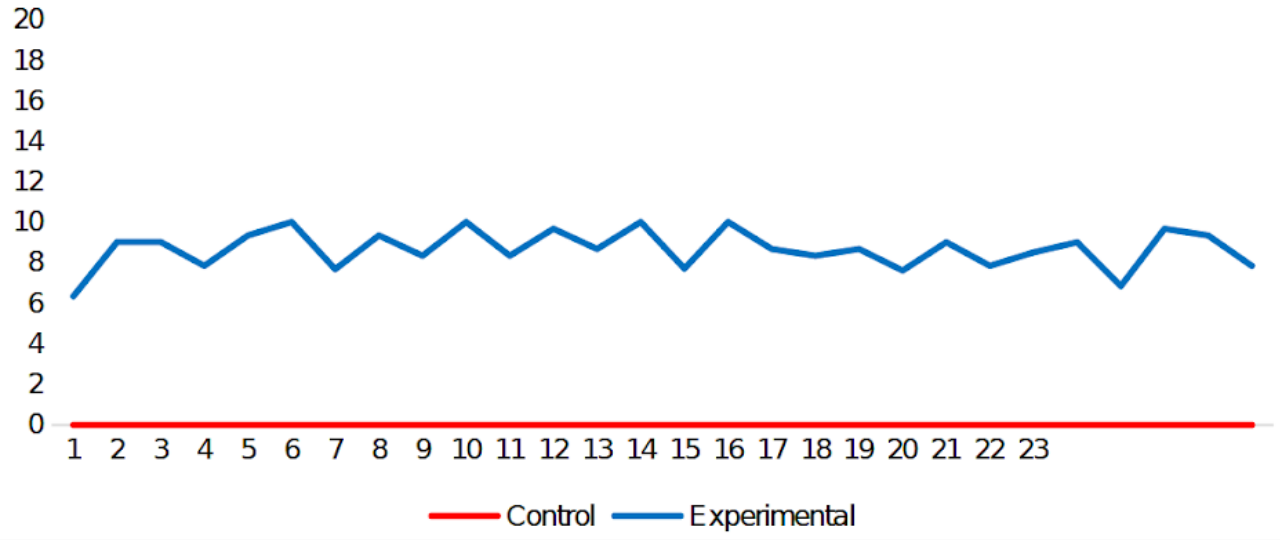
Figure 5: Posttest Average Score for Control and Experimental Group



The data suggest that the experimental group presented a very positive development of their critical thinking skills at the end of the course with an average of 8.65. In contrast to the control group which also exhibited an increase with an average of 7.24. This difference in the averages, unlike the pretest, is significant according to the details of the t-student test. The value of P for this test resulted in 0.001 and 0.002, both being less than 0.05. Therefore, the difference in these averages did have significant value.

Table 3: t-student Test for the Post test of Control and Experimental Groups

	Control	Experimental
Mean	7,24782609	8,65952381
Variance	4,17533597	0,93369195
Observations	23	28
Grouped variance	2,38912396	
Hypothetical difference of the means	0	
Degrees of freedom	49	
Statistic t	-3,24548957	
P (T <= t) one tail	0,00105822	
Critical value of t (one tail)	1,67655089	
P (T <= t) two tails	0,00211644	
Critical value of t (two tails)	2,00957524	

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IV. DISCUSSION

The data found evidenced that critical thinking had a greater development in the experimental group by integrating activities that encouraged discussion as a central aim of critical thinking in the Writing Styles course. One of the aspects that could have influenced the success of the treatment implemented is the collaborative work. In this sense, the results contribute to expand the findings of previous studies such as Gokhale (1995) and, which had shown the relationship that existed between critical thinking and collaborative work. The methodology of the central aim of the present study included in the activities work in pairs and groups, which seem to have had a positive effect on the results of the experimental group. For our research, the students of the experimental group had different opportunities to apply these skills, both individually and in group work during the phases of the project.

In addition, the present study evaluated critical thinking applying Saiz's model categories (2008). For Gokhale (1995), critical thinking is linked to the activity of analysis and evaluation that an individual can do when facing a problem. In this sense, similarly to the studies by Quintero et al. (2017) and Morales and Díaz (2021), the present study demonstrated that a teaching strategies such as case studies and problem-based learning impact positively in the development of critical thinking capacities. Thus, teachers should include as a fundamental component of their classes activities that require from their students to evaluate situations, assess information, and propose solutions to various problems.

Another aspect that should be noticed is the level of interaction promoted among the students. Tabares et al. (2019) had proven that the implementation of debates is also an effective teaching strategy to develop critical thinking. In this study, the treatment given to the experimental group required that the students share, contrast, and hypothetically test ideas with their peers through forums, discussions, teamwork, and application in concrete realities. Consequently, proposals of solutions were evidently positive with values such as solidarity, compassion to less fortunate people, and constructive criticism of situations of injustice being displayed. Likewise, the participants evidenced processes of analysis, reflection, and conscious evaluation of their real context, as suggested by Gokhale (1995).

The present study also revealed a positive level of engagement from the participants who were eager to actively contribute to propose solutions to issues analyzed during the class sessions (e.g., the decriminalization of abortion in El Salvador, the beginning of the electoral campaign for the presidential elections of 2019, the history of African roots in El Salvador, the situation of people with HIV in the workplace, new forms of masculinity, among others). Reed (1998), in his interaction with students, aimed to develop the analysis of contemporary social concepts. In this sense, he conducted interviews with the members of the groups asking about the applicability of what they learned in the course in other scenarios outside of academics. Based on the enthusiasm observed in the responses, it can be affirmed that similarly to Reed, relevant topics which represented potential conflicts within the social context of the participants may benefit the development of critical thinking skills.

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A final aspect to consider and emphasize is that the result of the present study show that critical thinking can be developed in written communication. The students of communication who participated in the research, undoubtedly, gained capacities that will serve well their professional future performance and their individual responses to the problems faced by their communities.

The results show that, to write comments and viable solutions, it is necessary that the students cultivate greater knowledge about the appropriate form in which value judgments should be made, have a wide range of information, and know different points of view about a situation (Mindiola and Castro, 2021), which is equivalent to being able to express oneself with critical thinking.

V. CONCLUSION

The purpose of this research was to determine if the implementation of a central aim in a course program promoted the development of critical thinking skills focused on reasoning, problem-solving, and decision-making in students. The data obtained from the pre- and post-tests seem to indicate that the central aim had a positive impact on the development of critical thinking skills of the students in the experimental group.

Thus, it is plausible to suggest the inclusion of teaching activities that encourage reasoning, problem-solving, and decision-making explicitly is an effective methodology to foster critical thinking in educational environments. Teachers can make an intentional selection of topics that generate interest of students to know, express, and offer solutions in an analytical and empathic way. Finally, based on the active response of the participants, it can be argued that students have interest in national issues, the need to express themselves, and to offer alternatives to solve various problems that arise in their social environments. Future studies could explore the opinions of the students receiving such explicit instruction to develop critical thinking, and how they transfer the newly acquired or enhanced capacity in other areas of their university studies and professional life.

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