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Online international collaborative learning between Brazilian and Argentine universities: implications for technological education

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Abstract: Due to the constant technological advances experienced by humanity, different ways of teaching and learning have become possible through a wide variety of combinations, whether face-to-face or virtual. A very affordable alternative for students is Online Collaborative International Learning. This article presents implications for technological teaching and teacher training based on the collaborative online learning process (COIL) carried out between students and teachers at the Federal Universities of Santa Catarina (UFSC) and Fronteira Sul (UFFS), Brazil, and the Universidad Nacional del Litoral, Argentina. The methodology consisted of the process's planning, implementation, and evaluation stages between Brazil and Argentina, carried out in May and July 2023. The results showed that a) there were a series of unexpected events that were considered a challenge to the planning and implementation of collaboration, requiring joint efforts from teachers and students, and b) the evaluation of the results achieved was considered positive about the structure, teachers, and students, despite some aspects having average evaluations, as was the case with language skills. The conclusion was that this practice allowed participants to come across different and more specific realities than those narrated in textbooks. These findings show that teacher training based on the mastery of technological tools, with collaborative work, can open new horizons for technological teaching and teacher training.

Keywords: COIL, learning, collaborative learning, technological teaching, teacher training.

Resumen: Debido a los constantes avances tecnológicos que experimenta la humanidad, se han hecho posibles diversas formas de enseñar y aprender a través de una amplia variedad de combinaciones, ya sean presenciales o virtuales. Una alternativa muy asequible para que los estudiantes participen en actividades de aprendizaje global es el aprendizaje internacional colaborativo en línea. Este artículo presenta implicaciones para la enseñanza tecnológica y la formación docente de los resultados del proceso de aprendizaje colaborativo en línea (COIL) realizado entre estudiantes y docentes de las Universidades Federales de Santa Catarina (UFSC) y Frontera Sul (UFFS) en Brasil y de la Universidad Nacional del Litoral, Argentina. La metodología consistió en las etapas de planificación, implementación y evaluación del proceso entre Brasil y Argentina, realizado en

mayo y julio de 2023. Los resultados mostraron que a) hubo una serie de eventos inesperados que fueron considerados un desafío para la planificación e implementación de la colaboración, requiriendo esfuerzos conjuntos de docentes y estudiantes, y b) la evaluación de los resultados alcanzados fue considerada positiva por parte de la estructura, docentes y estudiantes, a pesar de que algunos aspectos tienen evaluaciones promedio, como fue el caso de las habilidades lingüísticas. El estudio concluyó que esta práctica permitió a todos los participantes toparse con realidades diferentes y más específicas que las narradas en libros de texto. Estos hallazgos muestran que la formación docente basada en el dominio de herramientas tecnológicas, con trabajo colaborativo, puede abrir nuevos horizontes para la enseñanza tecnológica y la formación docente.

Palabras clave: COIL, aprendizaje, aprendizaje colaborativo, enseñanza tecnológica, formación docente.

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Aprendizaje colaborativo internacional en línea: relato de experiencia entre universidades de Brasil y Argentina

Resumen

Debido a los constantes avances tecnológicos que experimenta la humanidad, se han hecho posibles diversas formas de enseñar y aprender a través de una amplia variedad de combinaciones, ya sean presenciales o virtuales. Una alternativa muy asequible para que los estudiantes participen en actividades de aprendizaje

global es el aprendizaje internacional colaborativo en línea. Este artículo presenta implicaciones para la enseñanza tecnológica y la formación docente de los resultados del proceso de aprendizaje colaborativo en línea (COIL) realizado entre estudiantes y docentes de las Universidades Federales de Santa Catarina (UFSC) y Frontera Sul (UFFS) en Brasil y de la *Universidad Nacional del Litoral*, Argentina. La metodología consistió en las etapas de planificación, implementación y evaluación del proceso entre Brasil y Argentina, realizado en mayo y julio de 2023. Los resultados mostraron que a) hubo una serie de eventos inesperados que fueron considerados un desafío para la planificación e implementación de la colaboración, requiriendo esfuerzos conjuntos de docentes y estudiantes, y b) la evaluación de los resultados alcanzados fue considerada positiva por parte de la estructura, docentes y estudiantes, a pesar de que algunos aspectos tienen evaluaciones promedio, como fue el caso de las habilidades lingüísticas. El estudio concluyó que esta práctica permitió a todos los participantes toparse con realidades diferentes y más específicas que las narradas en libros de texto. Estos hallazgos muestran que la formación docente basada en el dominio de herramientas tecnológicas, con trabajo colaborativo, puede abrir nuevos horizontes para la enseñanza tecnológica y la formación docente.

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Introduction

Globalization and the strong development of the Internet have profoundly changed people's lifestyles worldwide. This unification of the globe has exacerbated the need for workers capable of working in a dynamic, ephemeral, and culturally mixed environment (Bauk, 2019; Appiah-Kubi; Annan, 2020). At the same time, Bauk (2019) reinforces that the ways of generating and transferring knowledge have also been modified, and different ways of teaching and learning have become possible through a wide variety of combinations, whether face-to-face or virtual.

For Hildeblando and Finardi (2018), traditional teaching-learning approaches have been gradually transformed and adjusted to the current world. According to these authors (2018, p. 22), "the internet has revolutionized human relationships, facilitating access to information, overcoming geographical and temporal barriers." Davis et al. (2023, p. 3) state that

a more accessible alternative for students to engage in global learning activities that appreciate cultural differences is through Collaborative Online International Learning (COIL).

COIL is an innovative pedagogical approach that uses digital technology to improve work content and enrich learning; it is used worldwide to provide opportunities for colleges and students from different geographic locations to participate in global engagement through shared learning (Davis et al., 2023). Still on the subject, Resta and Laferrière (2007) state that collaborative learning methods supported by technology have aroused increasing interest among organizations, teachers, and students, a complex concept that has not yet been fully defined. It is, therefore, a collaboration in a multicultural environment across different disciplines, which requires excellent attention to teaching, teamwork, research, and the provision of specific services (Bauk, 2019, our translation).

Specifically in higher education, the focus of study of this work, according to Hildeblando Júnior and Finardi (2018), is that there are many impacts and changes brought about by globalization and significant advances in information and communication. In this sense, these authors point to the COIL approach as a possibility to promote virtual collaboration between students and higher education institutions, given its potential to foster internationalization. Therefore, the COIL methodology is "considered an alternative to academic mobility and international collaboration" (Hildebrando Júnior; Finardi, 2018, p. 20). Within it, internationalization is central since it represents nations' international and intercultural integration process. It appears to be the highest stage of relations between educational institutions, significantly higher education institutions (Hildebrando Júnior; Finardi, 2018). Bauk (2017) confirms this thought when he says that the

COIL methodology allows virtual engagement in favor of the internationalization of the student's learning experience and their preparation for a competitive international market.

Appiah-Kubi and Annan (2020) reinforce this discussion by saying that it is not surprising that most colleges worldwide are investing efforts to internationalize their classrooms and the entire university community. For Hildebrando Júnior and Finardi (2018), internationalization promoted by collaborative learning actions is also an alternative for preparing the academic community to understand diversity and multiculturalism as a developer of skills, especially intercultural ones, understood as the ability to act effectively in different cultures. This development of skills is necessary, according to Hildebrando Júnior and Finardi (2018, p. 21), for the

act in a globalized society, both domestic and international; the individual must be flexible to interact with other cultures and ethical or religious groups because cultural differences manifest everywhere.

Bringing this discussion to the theme discussed in this study, an experience report of the collaborative online learning process (COIL) carried out between students and teachers at the Federal Universities of Santa Catarina (UFSC) and Fronteira Sul (UFFS) in Brazil is proposed, and the Universidad del Litoral, from Argentina. Therefore, this article aims to describe the results of the planning, implementation, and evaluation of the collaborative online learning process between Brazil and Argentina through the COIL - People Management extension project carried out between May and July 2023.

The unfolding of practice has significant consequences for technological teaching and points to new perspectives on teacher training. Technological education is not simply using technologies but developing sensible thinking, cognitive improvement, and creative capacity (Balajadia, 2015) to solve life's problems (Zhang et al., 2020). Technological teaching is carried out through technological resources and procedures, through which reality, life, and everyday life are represented with more reliability and precision. Teachers and students discover themselves as partners in the search for solutions to questions of their interests, working and jointly constructing answers to those questions (Alt et al., 2023; Rahmah et al., 2023; Mizyed; Eccles, 2023).

The following sections will present the methodology used throughout the project, from its conception to its final evaluation. Afterward, the results and their discussion and possible proposals for future work will be presented. Finally, the final considerations are presented, followed by references.

Methodology

This study took a predominantly qualitative, descriptive, applied, and case-study approach. It is also characterized as theoretical-empirical, as it adds theoretical knowledge to the field of research through empirical evidence. It is presented as descriptive, exposing a specific population's characteristics or phenomenon (Vergara, 1997). This research describes the reality of the project from conception to execution.

It is also characterized as applied research, which, according to Vergara (1997), is fundamentally motivated by the need to solve concrete problems, bibliography, and case study. The case studied is the COIL project promoted by the Federal University of Santa Catarina with the collaboration of the Federal University of Fronteira Sul and the Universidad Nacional del Litoral of Argentina. This project collected data through documentary research, observation, and questionnaires. Notably, the study's object was the project itself and not the participants; therefore, there was no identification in the database, and answering the questionnaires was optional. Regarding the experience report, based on observation and documentary analysis, it is highlighted that this was a pilot initiative in the UFSC Administration course, with the participation of the UFFS Administration course and represented an effort to contribute to initiatives related to internationalization promoted by the UFSC Secretariat of International Relations (SINTER). It was an extension activity structured in the COIL format - Collaborative Online International Learning

- which allows all participants (students and teachers) to learn about the conceptual emphases applied to People Management from the perspective of the other countries involved.

Furthermore, it was hoped to generate moments so participants could deepen their expertise through joint and collaborative information exchange. In this action, meetings were held using synchronous and asynchronous interaction tools, especially in the monitoring phase of the proposed work. The workload was 60 hours, divided into 14 meetings (in-person - at each institution and remotely) of 2 hours each, covering a programmatic structure planned in 3 distinct modules.

In the end, a questionnaire was administered without the identification of the respondent and without obligation to respond, the objective of which was to identify the participants' perception of the experience. To this end, a five-level measurement scale was established: grade 5 means excellent, grade 4 means very good, grade 3 means good, grade 2 means bad, and grade 1 means terrible. The project was analyzed in three dimensions: structure, teachers, and participants. Furthermore, they were asked about the project's main strengths and areas for improvement, and space was left for additional comments. The questionnaires were administered to the students, totaling 12 responses. The research was exempt from processing in the CEP/CONEP System as it falls within item VII of the sole paragraph of article 1 of Resolution No. 510/2016 - National Health Council.

Results and discussion

The project was carried out by the Brazilian institutions UFSC and UFFS, two public federal universities in Santa Catarina, and the Universidad Nacional del Litoral in Santa Fé, Argentina, which is also public and federal. In all three institutions, an undergraduate course in Administration is offered. It began when one of the authors of this work participated in a visitation period at a foreign institution and, to create teaching, research, and extension actions together to consolidate the partnership, planned the COIL action with the professor supervising the visit.

It is essential to highlight that internationalization has recently been considered an action valued by several Brazilian and international institutions. This project was unique and innovative because it was the third developed throughout UFSC. It aimed at developing Human Resources skills based on experience, even online, and exchanging knowledge and cultural experience with international students.

There were several planning stages, which enabled the creation of tasks and situations with positive potential for acceptance, as well as the discovery of others that meant that managers had to adapt and decide based on their experiences as teachers. Among them, the following stand out:

a) The internal structuring for offering the discipline – in this case, definitions of workload, days of offering, type of discipline, and prerequisites, among others, are complex examples that generated numerous adaptations on the part of managers.

b) Desired profile and creation of the proposal – as they are different institutional realities and with different professional profiles, they also required adaptations to make the project more palatable and appealing to the participants.

Several meetings (in-person and remotely) were held. In these meetings, a significant gain was the alignment of interests and the institutional support for such an initiative to get off the ground. This allowed managers to work more calmly, structuring and adapting their realities and desires as much as possible to develop specific skills in the participants.

Collaboration planning and implementation

The project considered the development of the participants' specific skills. Considering that a common theme to be used was the area of Human Resources, it became easier to outline what we wanted to provide to participants throughout the event. Among the competencies, the following are mentioned: collaborative work, communication, applied research, thematic knowledge, initiative, mastery of collaboration technologies, creativity, methodological mastery, planning of work routines, organization of time and work, and leadership, among others.

The project was structured according to the standard document on COIL, the result of countless research studies, and the participation of one of the authors of this work in a course promoted by the University of Santiago de Chile (USACH) on the topic. In the guiding document, situations such as the definition of the reference language, elaboration of activities to be developed by students, planning of the final work, and the participation of teachers and tutors are examples of the constituent elements that must be discussed and defined. In this sense, it is stated that the Spanish language was defined as the basis, as it was essential to be aligned with the institutional interests of the participating Universities regarding Internationalization.

It was imagined that Brazilian students would have greater ease of understanding and interaction due not mainly to their familiarity with the language. To this end, before starting the course, the project was publicized, making it clear how it would take place, in addition to requesting the completion of an introductory survey to identify the languages that candidates knew in the listening, speaking, and writing dimensions. It should be noted that the English language was also allowed to be used if necessary, which would supposedly facilitate even more communication between the Argentine and Brazilian parties involved. Other than that, there was no prohibition on using the Portuguese language despite the focus on the first language mentioned in this paragraph.

The execution time was defined to take place over three months, totaling 60 hours divided into 13-afternoon meetings of one hour and thirty minutes. It was decided that the first four would have classes on topics related to Human Resources so that participants could learn about a reality different from their own. Argentine and Brazilian teachers taught classes at these meetings, presenting their understanding of essential content, such as Recruitment and Selection, Training and Development, Performance Assessment, and Rewards.

However, what generated the most discussion for the preparation of the base project was the definition of the collaborative activities that the students would carry out. To this end, it was decided that a survey should be carried out with small companies and, preferably, in the same field of activity. By collaboratively constructing a research instrument, participants could better understand how managers (whether in the HR or general area) dealt with the main HR sub-processes already mentioned. It was later realized that this became a problem that will be better explained later.

As an evaluation of the final delivery, the qualitative aspects of depth of reporting and analysis, coherence, and triangulation between the theory and the Brazilian results obtained by the members according to their respective nationalities were worked on. In addition to the written work, students were required to make an oral presentation to a panel of the course's teachers and tutors. Another point defined in the project was the technological tools that should be used synchronously and asynchronously; after all, they would be the basis of interactions between participants and teachers/tutors. In the case of the project, Moodle was defined for Brazilian students as the leading platform, in addition to the WhatsApp application, for immediate interactions between all project members and the creators.

In the asynchronous part, Google Drive was extensively used, serving as a backup and alternative for students from other institutions to access and collaborate at any time. The planned tutoring system considered that each team would have access to an Argentinean and a Brazilian teacher. During the meetings, both would visit the virtual rooms to guide and resolve participants' doubts.

Another vital decision was the project classification, which generated greater engagement and demand from Argentine students in the Argentine case (classified as an optional subject). On the Brazilian side, it was registered as an extension project, whose mandatory participation was not required, which increased the complexity of engaging students, as it became more apparent after interpreting the results found.

Evaluation of results

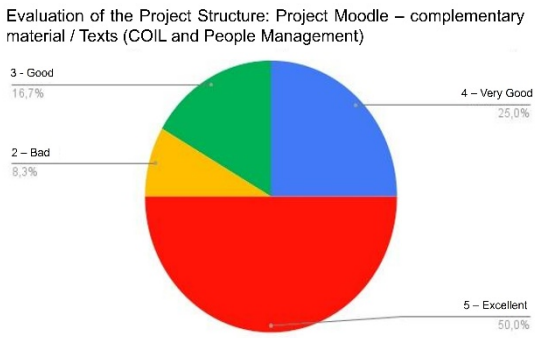
After the end of the project, an evaluation was carried out that was defined in three main aspects: Structure, Teachers, and Participants.

Structure

The responses related to the structuring of the page were mostly positive. Despite finding negative (wrong) percentages, it was not possible to identify what was not satisfactory in the qualitative responses. It is assumed that it was not due to a lack of encouragement on the part of the teachers; after all, there was a custom of encouraging Brazilian students to access the environment and read the material. Regarding the final work, a very positive evaluation was noticed. Therefore, depending on its impact, this constructive and collaborative evaluation is even considered for the following project versions. Figure 1 demonstrates what was mentioned.

Figure 1 - Evaluation of the project structure in Moodle.

FIGURE 1
Evaluation of the project structure in Moodle



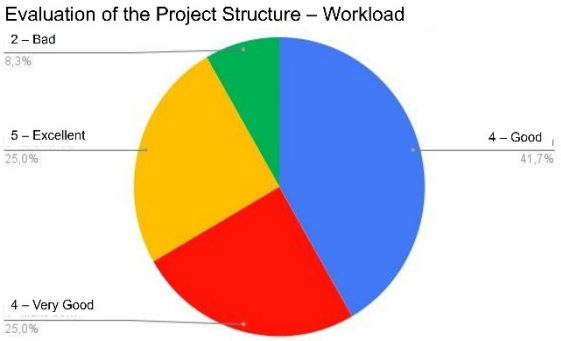
Source: Data collected by the authors (2024).

Source: Data collected by the authors (2024).

It is worth highlighting a positive manifestation of one of these points, according to the view shared by respondent 4, who stated that “contact with other people, content covered, materials and content made available were significant. " In this dimension, there was criticism regarding the workload, which the creators already expected: Of the 18 Brazilians registered, 13 were working at the time, which increased the chances of possible difficulties reconciling activities. Figure 2 even reinforces this.

Figure 2 - Assessment of the project structure – workload.

FIGURE 2
Assessment of the project structure – workload.



Source: Data collected by the authors (2024).

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The workload sizing was initially increased due to the belief that it would take time for students to build their research instruments more calmly, not forgetting the collaborative aspect between them and through the guidance of teachers/tutors. Furthermore, a larger space for carrying out the activities was considered, considering that the interaction times did not always coincide with each other, which led to initial difficulties in defining the type of company to be investigated, the negotiation inherent in the attempt to obtain permission to do the appropriate work, application, etc.

Despite this, it was found that this idea was not perceived in the desired way, resulting in criticism as explained by respondent 5, who understood that "there could be more meetings to be dedicated to the activity itself, considering that we, Brazilian students, our employees and we have little working hours during the day for such activities." It is worth clarifying that there was no impediment for students to work on their demands at post-class times other than their internships/work. This meets one of the characteristics requested and expected by those who take courses based on the application of this methodology.

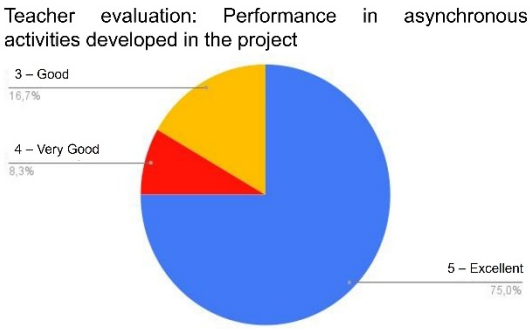
In the case of the project in question, three of the six participating teams initially structured said they did this. Two others were not, one of which was terminated because of this problem, according to reports from participants who gave up. About the content developed, a primarily positive evaluation could be seen, which showed that the project planners correctly outlined their decisions. Likewise, as a positive evaluation was obtained, the intention is to use the same scope for a future reissue of the project.

Teachers

The teaching dimension was the highest rated by students. Figure 3 demonstrates this.

Figure 3 - Assessment of the teachers involved.

FIGURE 3
Assessment of the teachers involved.



Source: Data collected by the authors (2024).

Source: Data collected by the authors (2024).

This fact can be better understood for the following reasons:

a) Teachers experienced remote teaching throughout the COVID period, which enabled the development of skills complementary to the traditional ones existing in the conventional classroom;

b) The teachers who taught the classes were the same ones who planned the project, all of whom already had many years of experience, which reduced complexity; after all, throughout the meetings, there was little content and guidance customized for teams.

c) There was a constant exchange of teachers in the virtual classrooms, which was expected to add more value to developing perceptions and understandings related to the topics covered. The qualitative considerations about this dimension strengthen the impressions narrated, given the view of respondent 8:

The professionals who guided the project were highly qualified, adding much to the experience. There was always the availability of help and assistance with any questions or problems, which was very good and gave more motivation to participate (Respondent 8).

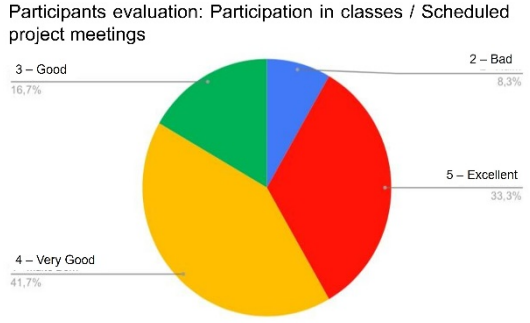
Respondent 11 mentioned that he obtained a "Broadening of the market vision, culture, and knowledge on the proposed topic" (Respondent 11). In other words, this dimension made a solid contribution to the project's success.

Participants

The participant dimension had the most significant number of questions; after all, the COIL project was developed for students. In this sense, the results were interpreted as follows.

Figure 4 - Assessment of the participant's dimensions.

FIGURE 4
Assessment of the participant's dimensions.



Source: Data collected by the authors (2024).

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At first, it was found that participation was not evaluated so positively, which caused surprise among the organizers. At various times when teachers visited the virtual rooms, it was possible to see a spirit of collaboration present. Naturally, one or more people felt more shy about doing so. It is believed that one of the problems is directly related to the mastery of the language by Brazilians and Argentines. The following comments point in this direction.

They do not know anything Portuguese. (Respondent 1).

Argentine students could also try to speak Portuguese; that would be cool! (Respondent 2).

So, a suggestion would be to create a tool to help people who do not speak Spanish and some tools in Moodle with summaries of what was covered in the call in Portuguese and Spanish (Respondent 7).

Here, at this point, some reflections must be made. The first concerns the supposed degree of language proficiency required. Even though the majority commented that they were familiar with the Spanish language, what can be concluded is that the premise was not so confirmed. In a way, it addresses one of the most frequent problems when thinking about the COIL methodology: mastering the language. Therefore, considerations must be accepted as natural and inherent to developing professional skills.

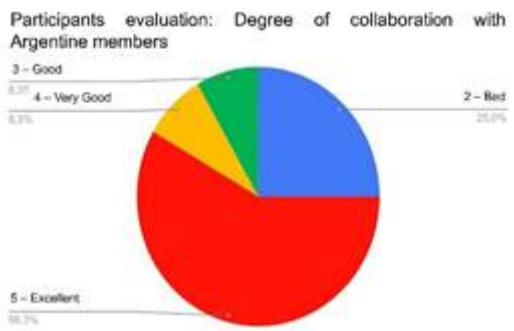
The second is the failure to remember that the project clarified that the official language would be Spanish. This situation is also understandable because, in moments of greater demands, one has the impression that the "problem" generally lies with others, which makes us adopt defensive strategies or expectations that are not in line with what was predetermined.

Regardless of the situation, what is important is to highlight the professional attitude of the participants in overcoming such linguistic barriers and practicing. This event generated positive comments as the visualization of the benefits of the COIL methodology expanded. The following comment, made by Participant 9, clarifies this for him: "It was an enriching opportunity as a whole, but I highlight as strong points the first meetings, where we were all together and talked about the reality of each country on issues in the area of HR" (Participant 9).

The majority of Brazilian students participated in synchronous classes. However, several had to be encouraged to do so. This led to the conclusion that the possible feeling in exchange experiences outside the country also occurred here: shyness due to excessive personal pressure to communicate without errors. Analyzing Figure 5, it appears that three people did not effectively collaborate with the Argentine members, and two did not feel motivated to do so.

Figure 5 - Collaboration assessment

FIGURE 5
Collaboration assessment



Source: Data collected by the authors (2024)

Source: Data collected by the authors (2024).

Based on the qualitative responses, the reasons supporting such positions were understood: The first was clarified through consideration made by Participant 9 because there was a "different reality about the project between Brazil and Argentina." Strictly speaking, in Argentina, it was an optional subject, where students had to do activities that would earn them grades aiming for approval. Not in the Brazilian case. It was an extension project where participation did not count attendance or more formal assessments like any other discipline. To this end, the same participant highlighted in her speech that "for us Brazilians, it was an extension, and there was no commitment to the activities; in the last meetings, we were idle" (Respondent 9). Participant 12, in turn, reinforced this impression when he mentioned: "One thing that left us with doubts, at least from what I noticed in our group, would be the issue of differences in assessments and deliveries for Brazilian students."

Given the above, it is understood in practice that this situation could influence participation in activities. It would require a greater motivational level when they did not realize that intrinsically, the values inherent to such situations existed. As previously stated, the project aimed to develop skills, including collaboration.

When interpreting the images of knowledge acquired and the degree of collaboration with Argentine members, it appears that the vast majority expressed themselves positively, which signals that it is possible to interact with people of other nationalities in remote school environments. Even with the difficulties described in previous paragraphs, working better on the influence of time factors, face-to-face study, and work routines is recommended to promote greater alignment of expectations about peers. Brazilians had such difficulties managing their schedules; the same occurred with Argentine students.

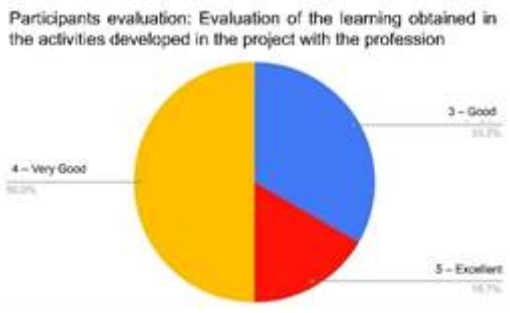
However, another critical point must be highlighted: even if a negative (bad) evaluation appeared around what was exposed in the previous paragraph, it could not be forgotten that this generated practically no negative influence. It is always good to remember that some people give up due to different difficulties, in line with the project's central objective: the development of skills. This reflection is based mainly on the statement of Participant 1, where there was a mention of valuing the gains obtained by participating and completing the project, which was the

Cultural exchange, knowledge of other practical realities, rapprochement with Argentina and other national and international universities, and online methodology, which, although not perfect, allows activities of this nature (Respondent 1).

This means that when the possibilities for personal gain are more significant and more in line with the expectations of something rarely offered in the university environment, there will possibly be an internal force capable of encouraging people to reach the end. At this point, evidence can be seen regarding the methodology's effectiveness since positive responses were found regarding the learning relationship with the profession and the personal evolution resulting from participation in the activities developed.

Figure 6 - Assessment regarding learning.

FIGURE 6
Assessment regarding learning.



Source: Data collected by the authors (2024)

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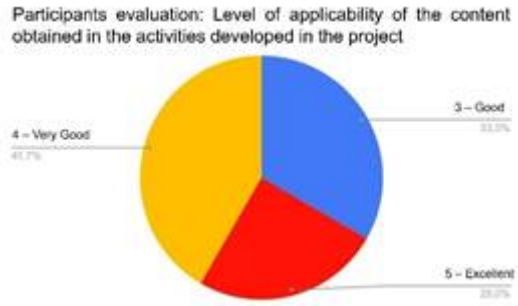
Overall, the results once again validated the planning decisions. They also validated the COIL methodology for developing critical thinking and collaboration. Figure 7 clarifies these aspects.

Figure 7 - Assessment regarding the applicability of the content.

FIGURE 7
Assessment regarding the applicability of the content.



Source: Data collected by the authors (2024).

Source: Data collected by the authors (2024).

A curious fact is the participants' observation regarding the level of applicability of what was being worked on. This is where content linked to tasks becomes essential. The students, in general, realized this as the managers of the companies researched expressed this level of applicability and, mainly, the problem they were experiencing when they did not have formalized structures and procedures derived from the content traditionally taught in the classroom. This is the point!

Criticality began to be worked on when all participants exchanged ideas and knowledge of "how to do it." At these moments, depending on the different cultures and constructions of everyone's personal and professional life, it was possible to work on several questions to reflect on what was possible or not possible to do when considering the problems narrated and the realities existing in companies. It should be noted that this practice allowed everyone to come across different and more specific realities than those narrated in textbooks that are usually considered "too distant" from the real world.

In the final aspect, about the degree of personal satisfaction with the project, the evaluation was very positive; as of the 12 responses obtained, five thought the project was "excellent," 4 as "very good," 2 as "good" and one as "bad." In the opinion of the project's creators, the result is within expectations, even more so because of the novelty of the idea and the need to create a more in-depth culture of exchange through techniques other than those traditionally known.

Discussion of results

The COIL project experience had exciting results, with severe and significant implications for technological education and teacher training. The first and most apparent is that the technological platform allowed the structuring of interactive practice between students from the two countries involved. This does not mean interaction is impossible through traditional, face-to-face, non-technological teaching. What should be pointed out is that technologically mediated teaching expands the possibilities of work and interaction, which requires teachers to master technologies and essential aspects of students and other teachers, such as linguistics, entering multicultural domains.

This was precisely one of the most tacit findings of the experience brought by the project. Teachers faced the need to use other skills that they traditionally did not use in face-to-face, non-technologically mediated classes. Speaking Spanish, on the part of Brazilians, and Portuguese, on the part of Brazilians, was one of

these needs, as well as speaking both languages, for those teachers with this ability. Furthermore, many of the planned and executed actions had to consider both audiences' cultural and evaluative aspects, a phenomenon that non-technological education hardly has to worry about.

A third implication for technological education and teacher training was the barrier of a lack of language skills. Naturally, this example attracted attention because it involved participants from two countries with different languages. However, it could also appear in communication between two groups of different professions, such as doctors and philosophers or street cleaners and astronomers. Language, both in the form of a foreign language and in terms of public vocabulary, also poses a considerable challenge for training teachers who want to work with technological education. It is necessary to overcome monoglots.

Synchronous technological teaching is still a significant challenge for students. This finding affected both Argentine and Brazilian students. It required different forms of action on the part of teachers from those they used to practice with face-to-face teaching that was not technologically mediated. This implication is significant because it brings to light an imperceptible reality throughout face-to-face teaching. Working (teaching and studying) synchronously requires similar discipline, in some cases, and is very different from face-to-face work. Procrastination tends to have a much more substantial impact on technological teaching than on non-technological teaching, which forces teachers to develop strategies that are very different from those they are usually used to. On the other hand, students also need to gain skills, attitudes, and values compatible with this new reality.

The last central observation from this experience was that practice, the operability of teaching, and the content taught are highly motivating factors for technology-mediated learning. Here, the fact that technological teaching cannot be confused with the same teaching carried out in person using technological resources comes to the foreground. Teachers developed strategies that allowed the use of technologies during synchronous meetings and the development of practical activities. Technologies allowed the understanding of the content and its operationalization in the same way that they mediated all efforts to produce the activity that would demonstrate the effective learning of the discipline's content. It is, therefore, necessary to have the ability to plan the use of teaching technologies and those that will support the execution of the desired production. There are, then, teaching technologies, academic production technologies, and technologies for evaluating the quality of this production, among countless others, that teacher training must cover.

Final considerations

This article pointed out some implications for technological teaching and teacher training arising from developing, implementing, and evaluating the collaborative learning experience between three higher education institutions, two in Brazil and one in Argentina. The approach applied was COIL (Collaborative *et al.*), which uses digital technology to improve the work's content, aiming to enrich learning. The project was called COIL - People Management and involved 60 hours, divided into 13 meetings throughout May, June, and July 2023.

Throughout the period, Brazilian and Argentine students were accompanied by teachers and guided in carrying out their tasks, which involved research and presentations on the various topics studied weekly in virtual meetings. In the end, a questionnaire was administered to the students so that the project could be evaluated. The responses obtained prove the effectiveness of the methodology applied here, given the positive feedback from most participants, both about professional learning and their evolution, both fruits of the rich exchange of experiences that took place while carrying out the proposed activities.

Finally, the validity of the pedagogical approach used here, and the ease of implementation are highlighted, especially considering the low cost and the decisive engagement of those involved, which makes it possible to replicate it for the adequate training of teachers for technological teaching. Therefore, it is suggested that it be carried out in new editions, keeping in mind the negative points raised by the participants, to improve

it. Furthermore, it is also interesting to apply it in other contexts and expand it to other management areas, in the certainty of the COIL methodology's excellent collaboration.

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