



Exploring the Implementation of CLIL in an EFL Virtual Learning Environment

Exploración de la implementación del AICLE en un entorno de aprendizaje virtual del ILE

Explorando a implementação de CLIL em um ambiente de aprendizagem virtual de ILE

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Received: 28/07/2021

Sent to peer review: 15/09/2021

Accepted by peers: 02/11/2021

Approved: 04/11/2021

DOI: 10.5294/laclil.2021.14.2.1

To reference this article (APA) / Para citar este artículo (APA) / Para citar este artigo (APA)
Yaguara, J. A., Villalobos, N. P., & Otálora, J. C. (2021). Exploring the implementation of CLIL in an EFL virtual learning environment. *Latin American Journal of Content & Language Integrated Learning*, 14(2), 187–214. <https://doi.org/10.5294/laclil.2021.14.2.1>

ABSTRACT. This paper reports an exploratory sequential mixed-methods and action research study of the Content and Language Integrated Learning (CLIL) methodology at a state institution in Florencia (Colombia). The study aimed to explore the implementation of CLIL in a virtual learning environment and its implications for English as a Foreign Language (EFL) learning during the health emergency caused by COVID-19. The data collection instruments were a single interview, observations, reflective journals, classroom artefacts, and a questionnaire. The findings reveal that the CLIL methodology contributes to English learning. Thus, the results show the significant role of keywords and content vocabulary, contextualized lessons, assignments, and virtual games in fostering the students' listening skills, oral production, motivation, critical thinking, and development of cultural awareness. Hence, the outcomes demonstrate that the integration of virtual tools benefits the CLIL methodology in the virtual learning environment. Finally, the paper contains evidence supporting the implementation of CLIL, the contributions to EFL learning, and suggestions for further studies.

Keywords (Source: Unesco Thesaurus): CLIL; EFL learning; teaching methodology; virtual tools; health emergency; critical thinking; motivation.

RESUMEN. El presente artículo reporta un estudio exploratorio-secuencial de métodos mixtos y de investigación-acción sobre la metodología Aprendizaje Integrado de Contenidos y Lenguas Extranjeras (AICLE) en una institución de carácter estatal en Florencia (Colombia). El objetivo de este estudio fue explorar la implementación de AICLE en ambientes virtuales de aprendizaje y sus implicaciones para el aprendizaje del Inglés como Lengua Extranjera (ILE) durante la emergencia sanitaria causada por el COVID-19. Los instrumentos para la recolección de datos fueron la entrevista, observaciones, diarios reflexivos, artefactos de clase y un cuestionario. Los hallazgos evidenciaron que la implementación del AICLE en ambientes virtuales contribuyó al aprendizaje del inglés. Adicionalmente, los resultados muestran el rol significativo de las palabras clave, vocabulario del contenido, lecciones contextualizadas, tareas y juegos virtuales en el fortalecimiento de las habilidades de escucha, la producción oral, la motivación, el desarrollo del pensamiento crítico, y la conciencia cultural. Además, los resultados de este estudio demuestran que la integración de las herramientas virtuales beneficia la metodología AICLE en los ambientes virtuales. Finalmente, este artículo contiene información que soporta la implementación del AICLE, sus contribuciones para el aprendizaje del ILE, y sugerencias para investigaciones futuras.

Palabras clave (Fuente: tesaurus de la Unesco): AICLE; ILE; metodología de enseñanza; herramientas virtuales; emergencia sanitaria; pensamiento crítico; motivación.

RESUMO. Este artigo relata um estudo exploratório-sequencial de métodos mistos e pesquisa-ação sobre a metodologia de Aprendizagem Integrada de Conteúdos e Línguas Estrangeiras (CLIL) em uma instituição estadual em Florença (Colômbia). O objetivo deste estudo foi explorar a implementação do CLIL em ambientes virtuais de aprendizagem e suas implicações para a aprendizagem do Inglês como Língua Estrangeira (ILE) durante a emergência sanitária por COVID-19. Os instrumentos de coleta de dados foram a entrevista, observações, diários reflexivos, artefatos de aula e um questionário. Os resultados mostraram que a implementação do CLIL em ambientes virtuais contribuiu para a aprendizagem do inglês. Além disso, os resultados mostram o papel significativo das palavras-chave, vocabulário de conteúdo, aulas contextualizadas, tarefas e jogos virtuais no fortalecimento das habilidades de escuta, produção oral, motivação, desenvolvimento do pensamento crítico e consciência cultural. Além disso, os resultados deste estudo mostram que a integração de ferramentas virtuais beneficia a metodologia CLIL em ambientes virtuais. Finalmente, este artigo contém informações que apoiam a implementação de CLIL, suas contribuições para a aprendizagem de ILE e sugestões para pesquisas futuras.

Palavras-Chave (Fonte: tesaurus da Unesco): CLIL; ILE; metodologia de ensino; ferramentas virtuais; emergência sanitária; pensamento crítico; motivação.

Introduction

The rapid spread of the Coronavirus disease (COVID-19) in the world led to a pandemic that produced a sudden change in people's lives. Subsequently, the virus impacted several fields of society, and the educational field was one of them. According to the United Nations Educational, Scientific and Cultural Organization (2020), most institutions closed to prevent the increase of Coronavirus cases. Thus, in Decree 417 of 2020 (Presidencia de la República, 2020), the Colombian government declared a state of economic, social, and ecological emergency throughout the national territory.

This situation has caused a considerable impact on education, and teachers had to adopt new alternatives to continue the teaching process. Following Carrillo and Flores' (2020) insights, educators faced a demanding task to develop their pedagogical interventions. As a result, teachers redirected their practices to assume the paradigm shift that emerged to teach outside the classrooms. Therefore, teachers incorporated Information and Communication Technologies (ICT) for developing their classes in the virtual environment. Nevertheless, teachers require certain sorts of skills to address lessons with the use of ICT (Fitri & Putro, 2021). Thus, teachers had to refine their digital skills to support virtual learning.

Despite the support of bilingual programs for EFL learning in Colombia, the proficiency levels are still low, and it becomes a challenge to implement suitable teaching methods. In this respect, Torres-Rincon and Cuesta-Medina (2019) state that one cause of low English performance is the use of conventional teaching methods in EFL classrooms. Accordingly, it is fundamental to innovate EFL learning by integrating modern teaching methods. In this line, CLIL emerged as a trend to face the actual teaching and learning needs concerning the EFL field (Bobadilla-Pérez & Cauto-Cantero, as cited in Lopes & Ruiz, 2018). According to Graddol (2006), CLIL "is a means of teaching curriculum subjects through the medium of a language still being learned, providing the necessary language support alongside the subject specialism" (p. 86). However, the implementation of CLIL in the Colombian context is limited, and the research studies in the country, specifically the Amazon

region, are not enough to have clear insights into this methodology. Also, McDougald (2009) claims that researchers have devoted interest to CLIL and its usefulness in different settings. Unfortunately, the implementation of CLIL is scarce in state institutions, and there is no sufficient evidence of its use in virtual learning environments. The author states that one cause of the low scope of CLIL into the state sector is that the methodology is consigned to private schools or universities. This situation highlights the need to implement CLIL in state schools to explore its implementation and implications. Consequently, this study rises from the preoccupation of a low English language level in the students' performance using traditional teaching methods in EFL learning.

In this mixed-methods and action research study, we seek to explore the implementation of CLIL in virtual environments and its implications for EFL learning. Accordingly, we developed this study under the pandemic's effects, integrating the foreign language with social science content in a group of eighth graders from the Instituto Técnico Industrial high school in Florencia (Colombia). Bearing in mind the limited insights regarding the use of CLIL in the region, this paper looks forward to providing significant outcomes that could be a basis for language teachers to promote the implementation of the CLIL methodology in the EFL virtual learning environment.

Literature Review

The trajectory of CLIL in Colombia aligns with the creation of the National Bilingual Program in 2004. Nevertheless, the CLIL methodology started to be implemented mainly in the private sector (Rodríguez, 2011). Thus, CLIL has been embraced in several research studies regarding its implementation to promote EFL learning. However, literature about CLIL in virtual contexts is scarce. This section contains previous studies that showed relevant findings and the scope of CLIL in virtual learning environments.

Concerning ICT tools and CLIL, Garzón-Díaz (2018) reported a research study at a state institution in Bogota. This research shows that ICT and CLIL engaged the participants with the lessons promoting

collaborative work among the students. The results showed that the digital component facilitated the design of science projects by providing several sources of information and tools. The students' used e-books to present their projects. The author concludes that CLIL and ICT worked as elements that support the learning of EFL and the acquisition of cultural awareness. Regarding the current role of technology in the educational field, Zhetpisbayeva et al. (2021) carried out a research study in Kazakhstan, Asia. Due to the pandemic, this research sought to analyze the perceptions about CLIL, comparing the skills of teachers immersed in secondary and higher education. The responses highlight the digital competencies, level of education, context, and sort of ICT tools available as determinant aspects to address in the lessons developed via a virtual environment. The findings also provide significant outcomes, showing that the use of CLIL provides a variety of challenging tools and strategies that favors the EFL virtual context. The authors claim that the adaptation of face-to-face classes to the virtual learning environment entails a rigorous process that could succeed with the appropriate use of platforms and teaching materials. Finally, the results indicated that professionals at universities demonstrate better expertise in the virtual environment than teachers in secondary schools.

Similarly, Setyaningrum et al. (2020) conducted a narrative inquiry in a primary school in Indonesia to know the implications of the CLIL methodology in the EFL virtual environment during the pandemic. The outcomes reveal that the English teacher faced challenging situations to deliver and adapt her lessons to virtual classes. The authors pointed out the need to develop both synchronous and asynchronous learning processes, since time in the virtual learning environment is not enough. Therefore, findings demonstrated that the CLIL framework: Content, Communication, Cognition, and Culture (4Cs) proposed by Coyle et al. (2010) was essential for the appropriate linking of meaningful tasks into the EFL virtual learning context. Finally, Waloyo et al. (2021) developed an investigation in primary school teachers from Indonesia to determine the perceptions of incorporating CLIL in the virtual environment. The findings showed that the implementation of CLIL in the mentioned context requires autonomy, motivation, interactions, and teamwork to create a supportive and appropriate virtual classroom.

Following the authors' insights, ICT offers a wide range of possibilities to enrich the virtual learning environment of classes based on the CLIL methodology. Thus, the results suggest a pertinent analysis of the language skills, content domain, and digital tools before integrating CLIL in virtual environments.

The previous research studies offered significant contributions regarding the implementation of CLIL in virtual learning environments. Additionally, it evidences some benefits and challenging situations presented within lessons based on CLIL. From the above research studies, CLIL is a current teaching methodology that strengthens English learning. It shows positive outcomes in the transition of traditional English classes to the virtual learning environment. By far, the present study will contribute to the progress of the CLIL trajectory, providing evidence of the pedagogical interventions carried out in the context of a global health emergency. With ICT support, this study focuses on the innovation of language teaching practices in a context where there is a lack of research studies regarding the use of CLIL in virtual environments. Subsequently, this paper will provide the findings that arose from integrating CLIL with virtual tools. Thus, the research question established for the development of the study came as follows:

What are the contributions in the implementation of Content and Language Integrated Learning (CLIL) and its implications for the EFL virtual learning environment in eighth graders at Instituto Técnico Industrial high school in Florencia, Colombia?

Method

The integration of mixed-methods and action research offer several advantages to a research study (Ivankova & Wingo, 2018). Therefore, it allows researchers to consolidate and support the data gathered through a rigorous process. According to Creswell (2014), mixed methods is a design that combines two forms of data to validate the information and obtain a deeper understanding of the phenomenon under study. On the other hand, Kumar (2011) states that action research leads researchers to address an issue through direct intervention,

implementing new alternatives in a specific context. Therefore, this is a mixed-methods and action research study that followed Burns' (2010) cycle: planning, implementing, observing, and reflecting.

Besides, Fetters et al. (2013) claim that the mixed-methods research study comprises the integration of the qualitative (QUAL) and the quantitative (QUAN) databases at the design, method, and reporting levels. Thus, this research study adopted an exploratory sequential mixed-methods approach. To this respect, Berman (2017) asserts that the exploratory design works with a QUAL phase followed by a QUAN. Firstly, we analyzed the qualitative data for building the quantitative instrument. Therefore, the initial phase aimed to explore the phenomenon under study. For selecting the sample in the QUAL phase, we used a simple random sampling method. In this type of probability sampling, every person can participate in the research study (Taherdoost, 2016).

Context and Participants

This research study was conducted at Instituto Técnico Industrial (ITI) high school. The state institution is located in Florencia, Colombia, and it offers primary and secondary education to people from the region. In total, the students attended two hours of English classes per week. Due to COVID-19, the teachers from the institution designed workshops for each subject. Accordingly, language teachers included different assignments in the workshops to develop in virtual environments. The participants of this research study involved us as English teachers, as well as eight females and ten males from the eighth grade. The learners were an average age of 14 years old. Based on a diagnostic test administered before the development of the research study, the students showed A2 English performance levels according to the Common European Framework of Reference for Languages (CEFR). Nonetheless, the Ministerio de Educación Nacional, MEN (2006) stipulates that eighth-graders should accomplish a B1 level. We labeled the respondents' names with a number considering the ethical framework.

Development of the Lessons Based on CLIL

We were responsible for designing the workshops and orienting the seventeen classes throughout eight weeks. The topics studied followed the academic contents of the institution’s curriculum, and the lessons took place twice a week through the zoom platform for one hour each. We supported the classes with virtual tools and interactive tools that encouraged team and individual work. After the topic explanation and the development of the class activities, the students developed a workshop. Therefore, during the seventeen classes, the participants delivered three workshops in total (Table 1).

Table 1. Activities based on CLIL

Workshops	Virtual tools	Nº class
<p>1. Questionnaire The topics worked on in this assignment were the Colombian Independence Day, the Spanish domain, the flower vase, the cry and the act of independence, the foolish fatherland, political systems, the Battle of Boyacá, the simple English tense, regular and irregular verbs.</p>	<ul style="list-style-type: none"> • Interactive boards in PowerPoint • Google classroom • ClassDojo • WhatsApp <p>We adapted some online games</p> <ul style="list-style-type: none"> • Bingo • Word search • Challenges • Guess the character • Hangman 	Classes first to sixth
<p>2. Video This workshop included environmental issues: air, land, noise and radioactive pollution, deforestation, biodiversity loss, overpopulation, and climate change, the present continuous, interrogative, affirmative, and negative questions.</p>	<ul style="list-style-type: none"> • Zombie dash • Jeopardy • Four pictures, one word 	Classes seventh to twelfth

Workshops	Virtual tools	N° class
<p>3. Classroom project Human and natural factors that affect the environment and future with <i>will</i> to make predictions.</p>		Classes thirteenth to seventeenth

Source: Own elaboration.

Data Collection Instruments

This section contains the instruments that we used for gathering the data. Following the research design of this study, we administered an initial interview to explore the variables and obtain themes for the development of the final Likert scale questionnaire. Additionally, to complement the QUAN data, we included observations, reflective journals, and classroom artefacts.

Semi-structured interviews. Interviews are qualitative instruments that guide researchers and participants during the conversation about the topic under study (Datko, 2015). This instrument aimed to collect the students' perceptions towards EFL and virtual learning environments (see Appendix A). Consequently, we administered this instrument in Spanish before implementing CLIL. We used the Zoom platform to develop the interview, and we received the participants' consent for recording their responses.

Observations. Mertler (2008) asserts that this instrument provides quality information to researchers, especially regarding students' reactions inside the classroom. Besides, Cowie, as cited in Heigham and Croker (2009), stipulates that, after every observation, the researcher can write field notes. Considering these advantages, we recorded the classes to examine the learners' attitudes based on the following criteria: motivation, participation, topics domain, use of the target language, and the students' skills.

Reflective journals. This instrument gives teachers significant insights into the students' experiences in the classroom (Farrah, 2012). Thereby, the participants delivered the reflective journals in Spanish,

and they uploaded their papers through the Google classroom platform weekly. This instrument allowed us to consider the participants' thoughts and recommendations to improve our pedagogical practices.

Classroom artefacts. It mainly focuses on the tools applied for educational purposes, their effectiveness, and their weaknesses for the learning process (Little et al., 2009). Along with this study, we collected workshops, lesson plans, and a rubric. Hence, classroom artefacts were determinant to establish the quality of the teaching practices during the implementation of CLIL in the virtual environment.

Questionnaire. For collecting the QUAN data, we administered a Likert scale questionnaire at the end of the interventions. Accordingly, Joshi et al. (2015) claim that a questionnaire is a psychometric tool that measures perceptions offering validated data. The questionnaire had nineteen closed-ended items derived from the results of the initial interview. Because of some limitations in the responses obtained from questionnaires (Dörnyei & Taguchi, 2009), the integration of the QUAL phase ensured the analysis of the research. This instrument played an important role in determining the level of satisfaction of the students during the use of CLIL in the virtual learning environment.

Data Analysis Procedures

This research study adopted a process of coding approach to reduce the data. According to Saldaña (2013), coding aims to organize data based on similar features and contents. Thus, we validated the initial interview employing the MAXqda software. With the program, we identified relevant segments in the responses. Therefore, it was possible to obtain the final themes that supported the building of the questionnaire for the QUAN phase. Moreover, we introduced the field notes derived from the observations, and the reflective journals to identify similar patterns, discrepancies, positive and negative aspects among the documents collected. Finally, we analyzed the classroom artefacts to monitor the students' performance. On the other hand, for the analysis of the Likert scale questionnaire, we applied descriptive statistics and validated the responses using the SPSS software version

28. Moreover, we implemented inferential statistics to calculate the generalizability of data.

For this study, we merged the results of the QUAL and QUAN databases narratively through categories. Likewise, we designed a joint display to compare both findings. According to Haynes-Brown and Fetters (2021), a mixed-methods design suggests a final process to integrate and report the data. Hence, joint displays are visual tools that show the datasets with inferences to confirm, expand or differ among findings (Younas et al., 2021). Thus, we labeled each data collection instrument as Virtual Interview (VI), Virtual Recorded Observations (VRO), Virtual Reflective Journals (VRJ), Classroom Artefacts (CA), and Virtual Questionnaire (VQ).

Findings

This section reports the findings that emerged after the analysis of the QUAL and QUAN data. Therefore, it involves the aspects that are linked with the outcomes of this research work. Thus, the categories that emerged from the integrated data were: (a) the role of keywords, content vocabulary, and assignments for promoting students' listening skills and oral production, (b) increasing participation in class and students' motivation, and (c) strengthening the students' critical thinking, and cultural awareness. Hence, these three main categories aim to answer the research question embraced in this research study. The excerpts included in this section are the authors' translations.

The role of keywords, content vocabulary, and assignments for promoting students' listening skills and oral production

This category highlights the effects of the social science content and assignments on promoting the students' listening and speaking skills. According to the results of the questionnaire presented in Table 2, the students manifested their levels of satisfaction towards the implementation of the CLIL methodology in a virtual environment.

Table 2. Frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	5.6	5.6	5.6
	Neutral	2	11.1	11.1	16.7
	Agree	14	77.8	77.8	94.4
	Strongly agree	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

Strongly Agree = 5 Agree = 4 Neutral = 3 Disagree = 2 Strongly Disagree = 1

Source: Own elaboration.

The information above stipulates that the students adopted positive and neutral perceptions towards CLIL. It is observed that 77.8% of the students agreed, 5.6% strongly agreed, and 5.6% disagreed. Additionally, the results show that 11.11% of the students were not interested in giving their opinions. However, from a statistical perspective, the majority of participants showed positive views of CLIL in the EFL virtual learning environment. On the other hand, the range of responses was (3) derived from the maximum (5) and the minimum (2). From the nineteen questions included in the questionnaire, five of them tested the effects of the social science content and assignments on the participants' language skills. Thus, the previous variables demonstrate that more than half of the eight-graders were satisfied with the mentioned aspects of the methodology.

The interpretation of these data revealed that the learners improved one receptive and productive skill; this finding is linked to the other data collection instruments, such as journals, observations, and classroom artefacts. Moreover, the participants stated that the assignments contained in the workshops were significant and benefited their learning. Similarly, they expressed that the integration of social science was a positive factor, considering the context of the participants -- the Amazon region. Students 18 and 4 indicate the positive effects of CLIL in promoting an appropriate environment for listening skills and oral production.

The classes are very interesting due to the games and activities that the teachers designed, making the students improve their knowledge.

In addition, I think that this is the fastest way to learn English.
(Student 18, VRJ)

In these classes, we learn new vocabulary, especially about events that were significant for Colombia. (Student 4, VRJ)

The students acknowledge that CLIL fostered their listening and oral production skills with the different assignments and games incorporated in the classes. Likewise, the learners showed improvement in their vocabulary, since they were permanently exposed to essential and meaningful words that supported the learning of the integrated subjects. Furthermore, the improvement of the mentioned skills is attributed to the constant input in the target language, whereas the adaptation of games provided the content vocabulary. Also, for the explanation of contents, the selected visual tools had a relevant function. The slides served as a virtual board where the learners could contribute to the class using the content vocabulary. Additionally, the students could understand keywords and the main ideas of the topics. Therefore, the Spanish language was less used for clarifications. Furthermore, the development of a classroom project at the end of the final term showed a notable performance in the learners' speaking skills during the oral presentation. We analyzed this outcome in the field notes that emerged from the observations.

The learners were able to use the language to communicate the contents. Additionally, the pronunciation of the keywords was appropriate. (Teachers' VRO)

The students showed the knowledge obtained of all the topics studied during the interventions. This way, the teachers could realize the effectiveness of the activities and the significant process of integration between both subjects. (Teachers' VRO)

These samples show the importance of the type of activities assigned to achieve the teaching and learning objectives established. The classroom project intended to cover the different structures and topics worked during the interventions. In this sense, we designed a sequence of assignments that were increasing their complexity systematically.

Overall, this category confirms that keywords, content vocabulary, and assignments were favorable and promoted the students' listening skills and oral production. Moreover, it suggests that CLIL is a

methodology that benefits the EFL virtual learning environment supported by interactive tools. Table 3 contains the questions included in the Likert scale questionnaire. We present the results according to the mean (μ) of the responses. We administered this instrument in Spanish based on the categories that emerged from the analysis of the initial interview.

Table 3. Results of the Likert scale questionnaire

Question	μ
1. Do you agree with the teaching and learning processes oriented through the use of ICT?	3.9
2. Do you consider that the lessons implemented by the ELT teachers were significant for your learning?	4.3
3. Do you think that through the virtual environment you were able to improve your English learning?	3.7
4. Do you think that you acquired the social science content successfully?	4.2
5. Do you think that the integration of English and Social science facilitated your learning?	4.0
6. Do you consider that the activities implemented during virtual sessions were adequate in contributing to your learning process?	4.2
7. Do you think that the activities implemented in the classes motivated you to learn?	4.2
8. Do you agree that the contents oriented during the integration of the subjects were relevant to your daily life?	3.9
9. Do you consider that the use of English during the classes was appropriate?	4.2
10. Do you think that the use of reflective journals was useful for your learning process?	3.7
11. Do you consider that there was motivation during the implementation of the CLIL to participate in the virtual learning environment?	4.1
12. Do you think that the use of virtual platforms contributed to the implementation of CLIL?	4.1
13. Do you consider that the feedback provided by the teachers was appropriate for your academic performance?	4.1
14. Do you consider that the attitude of the teachers was appropriate to contribute to the good development of the classes?	4.6
15. Do you think that the assigned activities were appropriate for the development of your language and cognitive skills?	4.2

Question	μ
16. Do you think that the teachers' interventions were enough to achieve meaningful learning?	4.1
17. Do you think that the lessons implemented based on the CLIL methodology were dynamic and contributed to a favorable learning environment?	4.3
18. Do you think that the topics were related to your context, contributing to the knowledge of problems that affect the environment, especially in our Amazon region?	4.1
19. Taking into account all the aspects included in the research developed, did you agree with the implementation of CLIL in virtual environments?	4.4

Strongly Agree = 5 Agree = 4 Neutral = 3 Disagree = 2 Strongly Disagree = 1

Source: Own elaboration.

Increasing participation in class and students' motivation

Motivation was a determinant factor to succeed in the implementation of CLIL with the mediation of ICT. This second category came from the descriptive analysis of the questionnaire and the students' reflective journals. Accordingly, the following values describe the distribution of the responses provided by the learners based on the aspects included in the Likert scale instrument. Although motivation was a dimension immersed in three questions in the mentioned tool, both categories are interconnected to make CLIL an integral methodology.

Table 4. Descriptive statistics

Results		
N	Valid	18
	Missing	0
Mean (μ)		3.8333
Median (Med)		4.0000
Mode (Mo)		4.00
Std. Deviation (SD)		.61835
Percentiles (Pk)	25	4.0000
	50	4.0000
	75	4.0000

Source: Own elaboration.

Table 4 informs about the distribution of responses. It evidenced the positive satisfaction with the methodology centered with $\mu=3.8$. The Med was equal to 4.0, and the Mo confirmed that the concentration of the responses relies on 4.0. Additionally, the SD points out a 0.61835 value in the dispersion of the data. These results reveal that the implementation of CLIL was more effective than weak since the majority of the participants reported an agreed level of satisfaction. Therefore, it shows that the SD had low indicators of outliers. Besides, the measure of the non-central location indicates that 75% of participants were between the level of 4 or less. The other 25% of the population responded on a 4 to 5 scale. Likewise, in the reflective journals, the students wrote their insights towards the interventions.

I like very much that the teachers implemented points the students feel motivated every day to learn the English language. (Student 1, VRF)

This excerpt focuses on the platform ClassDojo that we incorporated in the classes to assign positive points to the students for their participation. This platform was suitable to motivate our students to be active during the lessons. Furthermore, the following opinions exemplify the benefits of including challenges as dynamic strategies to motivate the participants. It enriched the classes empowering the learners to participate and be attentive to the explanation of the contents.

We developed an activity in the class that involved four challenges. We learned more about the topics that we were going to study: deforestation, global problems, overpopulation, among others. (Student 11, VRJ)

These two classes with the teachers of Universidad de la Amazonia have been very good and enjoyable because they teach us through games in which we learn a lot about independence. This week I learned more about important people of that time and other facts, and I learned how to write it in English using the past tense. (Student 7, VRJ)

Following the students' statements, the common patterns among their responses are notable. The students' views are linked, since the lessons based on CLIL encouraged them to participate. Thereby, words like *dynamic*, *meaningful*, *funny*, and *easy* appeared several times during the interpretation of the data. Altogether, the integration of ICT and

the CLIL methodology contributed to the increase of learners' motivation. Thus, the mediation of ICT in integrated learning provided the opportunity to have a dynamic virtual environment to learn while enjoying the process.

Strengthening the students' critical thinking, and cultural awareness

This last category highlights the advantage of selecting social science as the content subject. The data came from the reflective journals and the observations, and it did not show discrepancies in the participants' views towards the CLIL methodology. Conversely, the students frequently showed beneficial comments. Additionally, the last part of this section contains a joint display that presents the inferences that emerged based on the data collection instruments used. The samples from the students' journals are shown in the following excerpts:

I think it is important the topics we have studied about the environment because it shows us the responsibility that we have to take care of the planet. (Student 16, VRJ)

Teachers have given us information that we didn't even know, such as which country was the least polluted in the world. (Student 4, VRJ)

English is very important to have a better future and Social Science to know more about our country and the whole world. (Student 7, VI)

In the first place, the students emphasized the importance of the kind of topics worked on during classes. Thus, they commonly expressed that it made them aware of their realities. It is related to the global competencies where the students become more sensitive and reflective about difficulties presented in their context. Furthermore, student 7 expressed that both subjects are relevant to consolidate significant knowledge applied in real life.

Likewise, student 9 referred to the classroom project as an appropriate alternative to include in the learning process. The project received a high approval from the participants because they felt encouraged to contribute to something positive for the environment. Moreover, student 13 stated that the contextualization of content allowed them to use their knowledge and skills to improve their lives in the real world.

The last activity is good; it helps us to determine environmental issues in our context and to think about the solution. (Student 9, VRJ)

I like that the teachers take the time to explain what we do not understand. They explain it with everyday situations, and we can understand more easily. (Student 13, VRJ)

The students socialize with their classmates and develop critical thinking. Learners also used problem-solving skills giving examples for the design of the project. (Teachers' VRO)

In the second place, the outcomes of the assignments based on CLIL and the classroom artefacts served as assessment tools to analyze the students' learning progress. The tasks contained in the workshops focused on historical events in Colombia and the current environmental issues. Additionally, in the presentation of the final classroom project, the students showed confidence and satisfactory performance. Therefore, the students felt comfortable in the virtual environment, showing a predisposition to complete the activities.

The students were able to use basic grammar structures and use keywords to develop the final activity. It evidenced that learners felt comfortable during the oral presentation, and they included the target language since the participants studied it during the interventions. (Teachers' VRO)

Overall, the above samples suggest that CLIL promoted cognitive processes in students' critical thinking and led to the acquisition of cultural awareness. In this sense, the participants acquired knowledge and abilities such as argumentation, problem-solving, and research basic skills. The joint display in Table 5 contained the experiences that the learners had during the exposure to the CLIL methodology. The quantitative values summarize the data set show the level of satisfaction based on each of the themes. The inferences show the implications of the results compared between the outcomes of the initial interview and the final questionnaire. Hence, the joint display indicated that the connection of findings was between confirmation and expansion. Based on that information, it reveals that there were no inconsistencies among the QUAL and QUAN data. Conversely, new variables emerged during the QUAN phase to reinforce the global findings.

Table 5. Theme display for qualitative and quantitative strands

Themes	QUAL data	QUAN data	Inferences
Activities	<p>Time is limited, so we develop a workshop. (Student 18, VI)</p> <p>We have fun with the activities assigned, and at the same time, we learn English and social science easier. (Student 8, VRJ)</p>	<p>N=18</p> <p>55.6% agree</p> <p>33.3% strongly agree.</p>	<p>Expansion: In the interview the participants exposed their desire to work with different activities. After CLIL, the majority of the students approved the kind of activities implemented, pointing out that they were more dynamic.</p>
Virtual learning environment	<p>Due to the pandemic, it is great that teachers use technology. (Student 15, VI)</p> <p>I like the platforms and topics that the teachers used to develop the virtual classes (Student 4, VRJ)</p>	<p>N= 18</p> <p>61.1% strongly agree</p> <p>22.2% agree.</p>	<p>Confirmation: The students expressed their interest in attending the lessons in the virtual learning environment. Nevertheless, they highlighted the contributions of virtual platforms and games for their learning process with CLIL.</p>
Use of EFL	<p>The participants played the jeopardy game that involved the four English skills (Teachers' VRO)</p> <p>It is really good to learn social science in English because it helps us to know new words and their pronunciation (Student 3, VRJ)</p>	<p>N=18</p> <p>44.4% strongly agree</p> <p>33.3% agree.</p>	<p>Expansion: This finding expands our insights based on the data gathered in the initial interview since the learners did not specify the amount of English used for attending their regular English classes.</p>

Themes	QUAL data	QUAN data	Inferences
CLIL Methodology	The teaching methods are funny and dynamic (Student 1, VRJ) The students felt motivated to participate, they could gain positive points for the Class Dojo platform (VRO) ...we learn faster (Student 12, VRJ)	N= 18 50% strongly agree 38.9% agree.	Expansion: This result supports that CLIL is lined with the students' expectations and improvement of learning. Thus, half of the population was satisfied with all aspects included during CLIL in the virtual environment.

Source: Adapted from Younas et al. (2021).

Discussion

This research study aimed to explore the implementation of CLIL in an EFL virtual learning environment at a state school. This section focuses on discussing the three main categories that came from the analysis: the role of keywords, content vocabulary, and assignments for promoting students' listening skills and oral production; increasing participation in class and students' motivation; and strengthening the students' critical thinking, and cultural awareness. Hence, it determined that the implementation of CLIL into virtual environments contributed to EFL learning.

Despite the challenges generated in the virtual learning environment, Garzón-Díaz (2018) and Abaunza et al. (2020) explained that using ICT for educational purposes served as a crucial support for contributing to the students' learning process. Firstly, the enhancement of the listening skills and the oral production demonstrated that the students immersed in lessons framed by the CLIL methodology were more interested in using the target language. The students considered that the exposure to the English language was enough, since every class provided the respective language structure, keywords, and content vocabulary. Therefore, the learners' performance evinced the connection

between the input and output produced. This assertion fits with Mari and Carroll's (2020) findings, which suggest that pedagogical practices required a purposeful use of the English language. On the other hand, the integration of the CLIL principles offered an environment to promote English skills using real-life content. Similarly, Setyaningrum et al. (2020) pointed out that the 4Cs framework ensures learning of the content and language simultaneously.

Secondly, the increase of participation and motivation is attributed to the exposure to CLIL as a new teaching trend for EFL learning and the adaptation of virtual tools. We included virtual platforms to engage the students in a favorable environment for the content and language achievement in the state school. In light of this, Mede and Çinar (2018) presented motivation in CLIL as one of the most important aspects to design significant lessons in face-to-face classes. Besides, Mofareh (2019) stated that virtual tools promote a more dynamic and pleasant environment that strengthens learning. Additionally, the investigation of Zhetpisbayeva et al. (2021) and Waloyo et al. (2021) indicate that didactic materials for lessons based on CLIL and the teachers' digital skills are fundamental to collaborate between the teaching methodology and technology. Although we developed this study in a virtual environment, the learners showed an adequate level of motivation, and they participated actively in every class. Hence, it proved that the low levels of motivation and non-engagement with the lessons derived from the lack of innovative teaching methodologies in EFL virtual environments.

The last finding of this research study is related to the results of Benalcázar-Bermeo and Ortega-Auquilla (2019), since the authors linked the learners' achievement of critical thinking to the contents integrated during lessons. Hence, the social science subject boosted the thinking process in participants through real-life events. Nonetheless, cultural awareness was an additional finding that highlighted the contributions of CLIL in the EFL virtual learning environment. Accordingly, Diab's et al. (2018) study revealed that meaningful assignments provided accurate contextualization of the topics that encouraged learners to think critically. It demonstrates that CLIL promotes value to the culture of learners implicitly based on the customized tasks in the EFL teaching.

During this research study, data collected did not show a meaningful improvement in reading and writing, despite the fact that some activities included these two receptive and productive skills. Nonetheless, the CLIL methodology can also be meaningfully employed since its framework (4Cs) offers balance and outcomes that benefit the mastering of the four communicative skills.

Conclusions

This research study reported that the implementation of CLIL contributed to EFL learning and had positive implications in the virtual learning environment. The mixing of qualitative and quantitative methods provided adequate data to deal with the research question. The findings determine that CLIL is a suitable methodology that brings various contributions to EFL learners. Moreover, the results demonstrated the positive implications of CLIL, showing that the participants experienced a meaningful and dynamic virtual learning environment. Therefore, the implementation of CLIL in a state institution challenged the existing paradigm in considering CLIL as a privilege that is embraced in bilingual or private schools exclusively. Thus, it was possible to address an innovative teaching process that may promote its use among other state schools.

Additionally, we confirmed that meaningful learning raises where pedagogical interventions disassociate conventional approaches. Thereby, the findings that emerged in this study call EFL teachers to integrate the current teaching tendencies within their practices, and it demands educators' attention for the training on digital skills. Likewise, the level of satisfaction showed by the students towards the virtual tools leads us to conclude that the virtual environment emerged as a complement to the face-to-face classes, promoting autonomy in the learning process and increment of motivation in students. Nonetheless, teachers should be equipped and open-minded to adapt and support the educational process with innovative practices.

Finally, we can state that the implementation of CLIL during the health emergency facilitated the EFL learning in students from a state

school since they acquired English and social science content simultaneously. Therefore, the integrated subjects allowed us to teach contextualized topics. Thus, the students could identify, reflect, and propose alternatives to deal with difficulties from their context. On the other hand, the four communicative skills were notably promoted, especially listening and speaking. The results evidenced that one of the advantages of CLIL was flexibility, and the application of the CLIL framework was fundamental. It permitted to design lessons that supported and contributed to the success of teaching and learning in the virtual environment by making a connection between the 4Cs. Thus, findings proved that CLIL fosters interdisciplinary learning since the assignments and achievement of lessons raise awareness and global citizenship competencies in students.

Further research

After this exploratory sequential mixed-methods and action research study, we want to highlight some relevant aspects for further research studies. We suggest adjusting this research study to different educational fields focusing on other learning needs. For instance, integrating new subjects could be pertinent. Despite the extensive implementation of the CLIL methodology in private institutions, there is a lack of literature regarding the use of CLIL in virtual learning environments, specifically in the Amazon region. In this sense, we encourage further research upon the CLIL methodology, but in state institutions. Finally, with the rapid spread of ICT in education, research studies devoted to creating virtual platforms with customized materials may be considered suitable to increase the scope of CLIL in the EFL field.

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Appendix A: Semi-structured interview

1. What is your opinion about the processes of teaching and learning through the use of information and communication technologies (ICT)?
2. Do you consider that the virtual classes implemented by the English teacher have been significant for your learning?
3. What have been the most frequent problems you have faced during your virtual English classes?
4. What have you liked the most during your virtual English learning?
5. What platforms or web pages have you used for the development of your academic work in the English subject?
6. What technological devices (tablet, cell phone, computer, among others) have you used to access the virtual learning environments for the English subject?

7. What virtual tools (platforms, applications, or programs) that you have not used until now, would you like that were included in the development of virtual English classes?
8. Do you think that English as a foreign language has allowed you to learn other subjects? Which ones?
9. How often do you use English as a foreign language to communicate what you have learned?
10. What do you think about the teaching of social science content through English as a foreign language in state institutions in the department?