Evaluating the effectiveness of a CLIL-Based VLE course on English vocabulary development of Physical Education teachers at IDERF: A descriptive quantitative study

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Abstract

This study aimed to evaluate the English vocabulary proficiency of Physical Education (P.E.) teachers at Instituto Deportivo y Recreativo de Fusagasugá (IDERF) through a Virtual Learning Environment (VLE) based on Content and Language Integrated Learning (CLIL). Utilizing a descriptive and quantitative approach, the research involved 21 P.E. teachers, employing entry and exit-course vocabulary tests and participant satisfaction surveys for data collection. Results indicated significant improvements in teachers' vocabulary skills and high levels of motivation and satisfaction with the course. The findings suggest that CLIL-based VLEs are effective tools for improving English language proficiency in P.E. teachers, contributing to better teaching practices and student learning outcomes. The study underscores the potential of VLEs in providing flexible and engaging learning experiences, making them a valuable addition to educational methodologies.

Keywords: Vocabulary proficiency, physical education teachers, virtual learning environment, content and language integrated learning, vocabulary tests, teacher motivation.

Resumen

Este estudio tuvo como objetivo evaluar el dominio del vocabulario inglés de profesores de Educación Física (E.F.) del Instituto Deportivo y Recreativo de Fusagasugá (IDERF) a través de un Entorno Virtual de Aprendizaje (AVA) basado en el Aprendizaje Integrado de Contenidos y Lenguajes (AICLE). Utilizando un enfoque descriptivo y cuantitativo, la investigación involucró a 21 P.E. profesores, empleando pruebas de vocabulario de entrada y salida de cursos y encuestas de satisfacción de los participantes para la recopilación de datos. Los resultados indicaron mejoras significativas en las habilidades de vocabulario de los profesores y altos niveles de motivación y satisfacción con el curso. Los hallazgos sugieren que los VLE basados en CLIL son herramientas efectivas para mejorar el dominio del idioma inglés en educación física. docentes, contribuyendo a mejores prácticas docentes y resultados de aprendizaje de los estudiantes. El estudio subraya el potencial de los VLE para proporcionar experiencias de aprendizaje flexibles y atractivas, lo que los convierte en una valiosa adición a las metodologías educativas.

Palabras claves: Dominio del vocabulario, profesores de educación física, entorno virtual de aprendizaje, aprendizaje integrado de contenidos y lenguas, pruebas de vocabulario, motivación docente.

Table of Contents

Introduction to the Research Study 11

Context of the Research Problem 12

Research Question 13

General Objective 14

Specific Objectives 14

Rationale for the Research Problem 14

Rationale for the Methodologies to Address the Problem 16

Scope and Limitations of the Study 17

Literature Review 18

State of the Art 18

CLIL Methodology Applied in Virtual Learning Environments 19

CLIL Methodology Applied to Teaching English In P.E. 21

VLE for P.E. Teaching 24

Design of VLEs for English Vocabulary 26

Theoretical Framework 30

CLIL in P.E Classes 31

Characteristics of CLIL Methodology 32

Language Learning Mediated by Virtual Learning Environments 34

Vocabulary Learning Evaluated in VLE 38

Conceptual Framework 40

Success Indicators in Evaluating the VLE Course for English Vocabulary Development Among P.E. Teachers 41

Entry and Exit Tests for Vocabulary Assessment 43
Rationale of The Research Study on The Literature 44
Research Design 46
Methodological Design 46
Research Method 47
Research Approach 48
Context of the Research 55
Population 56
Sampling 57
Research's Impact 57
Ethical Protocol 59
Data Collection Techniques 62
Description and Rationale of the Instruments 62
Application Mode 64
Validation Procedures 65
Criterion Validity 65
Data Analysis and Findings 67
Data Management Procedures 67
Results 69
Categories 69
Discussion of Categories 70
Reliability and validity of analysis and findings 100
Objectivity of Results 100

Credibility and Reliability of Findings 102
Discussions and Conclusions 103
Discussion 103
Interpretation Of The Findings 104
Research implications 106
Research implications for the field of study 106
Research Limitations on the Present Study 107
Assessment of Specific Skills in Vocabulary 107
Absence of Control Group 108
Sample Size 109
Duration of the Course 109
Recommendations for Further Research 109
Conclusions of the Study 112
Reference 114

List of Tables

Table 1 *Emerging Categories Chart* ……..……69

Table 2 *Online Learning Answers Category*……70

Table 3 *Survey Question 1*……...…72

Table 4 *Survey Question 2*……...74

Table 5 *Survey Question 3*……..….75

Table 6 *Survey Question 4*……...…77

Table 7 *Survey Question 5*……...79

Table 8 *CLIL Methodology Answers Applied in the VLE.*……...81

Table 9 *Survey Question 6*……...83

Table 10 *Survey Question 7*…….84

Table 11 *Survey Question 8*…….86

Table 12 *Survey Question 9*…….87

Table 13 *Survey Question 10*……...…89

Table 14 *Result of exams* ……92

Table 15 *Shapiro-Wilk*……..…96

Table 16 *Wilcoxon test*……..…96

Table 17 *Wilcoxon entry and exit test indicators* ……99

List of Figures

Figure 1 *Stages of the Methodological Design 1*……..……..…55

Figure 2 *Survey Question 1*……..…72

Figure 3 *Survey Question 2*……..73

Figure 4 *Survey Question 3* ……75

Figure 5 *Survey Question 4* ……77

Figure 6 *Survey Question 5* ……...……..79

Figure 7 *Survey Question 6* ……..…82

Figure 8 *Survey Question 7*……..84

Figure 9 *Survey Question 8* ……86

Figure 10 *Survey Question 9* ……...87

Figure 11 *Survey Question 10* ……89

Figure 12 *Histogram Entry and Exit Test*…….……...95

Figure 13 *Box Plot of Entry and Exit Test* ……...…...…97

Figure 14 *Bar graph of Overall Results* ……...……..99

List of Appendix

Appendix A *Resumen Analitico Eductivo*…… 122

Appendix B *Introductional Videos*……134

Appendix C *VLE content*……..135

Appendix D *Informed consent* ……...140

Appendix E *Entry test*……...141

Appendix F *Exit test*……..143

Appendix G *Survey*……...…….146

Appendix H *Data tabulation charts*……149

Introduction to the Research Study

Physical Education (P.E.) is a discipline that has developed extensively in recent years, especially in Colombia, where its presence has been strengthened in study plans and programs. According to Gómez-López et al. (2018), in recent years, P.E. has become increasingly important in the educational environment of Colombia, being recognized as a fundamental discipline for the integral development of students. As a result, P.E. teachers have a fundamental role in the integral formation of young people, not only in sports and physical activity but also in the development of social and cognitive skills.

In this sense, P.E. and recreational activities are valuable tools for learning a second language, such as English. According to Dalton-Puffer (2011) and Lasagabaster and Doiz (2017), communication in an authentic environment is essential for the development of linguistic competencies, as it provides a natural and meaningful context for practicing the target language and fostering English communication in real-life situations. Additionally, P.E. as a recreational subject can have a significant impact on second language learning. Tümkaya and Stamou (2017) suggest that incorporating physical activities and games in the language classroom can improve students' motivation and interest in language learning, which in turn can lead to better retention of information and the development of effective communicative skills.

Likewise, studies conducted by García-Sánchez and Gómez-Martínez (2019) highlight the importance of using games and recreational activities in the learning of English as a second language, which can increase students' motivation, improve their linguistic competence, and help them feel more confident and comfortable using the language. To meet these needs, this study was implemented at Instituto Deportivo y Recreativo de Fusagasugá IDERF. This study aimed to

enhance P.E. teachers' English language proficiency in technical P.E. terminology through a virtual learning environment (VLE) based on the CLIL methodology.

Vocabulary learning is essential for the development of effective communication skills in learning a language, according to authors such as Thornbury (2002) and Nation (2001). It is important to teach vocabulary in context and in a meaningful way to ensure comprehension and retention, as highlighted by Nation (2001). To develop receptive and productive vocabulary skills, Schmitt and Zimmerman (2020) indicate that it is necessary to expose students to a wide variety of words and expressions and provide them with opportunities to practice their use in different contexts. Furthermore, vocabulary knowledge can significantly improve listening comprehension, according to Vandergrift and Goh (2012), who highlight that a lack of vocabulary knowledge can make it difficult to understand spoken language while knowing a wide variety of words and expressions can make it easier. Finally, vocabulary knowledge is also essential for the comprehension of written texts, as knowledge of keywords and common expressions significantly improves the comprehension of written texts in English, as Hu and Nation (2000) found.

Context of the Research Problem

The current study aims to assess the perceived impact of a Virtual Learning Environment (VLE) course based on the principles of Content and Language Integrated Learning (CLIL) on the English vocabulary development of Physical Education (P.E.) teachers at IDERF. Fusagasugá, a city in Cundinamarca, faces a significant challenge due to the lack of English proficiency of these teachers, which limits the implementation of bilingualism programs in the sports and recreational field. Most IDERF P.E. teachers do not receive adequate training in English during their undergraduate studies since the curriculum does not highlight English as a

fundamental skill and does not provide any training in technical English related to their area of expertise (Cortés, J. 2020).

The IDERF is a key municipal public entity in Fusagasugá, responsible for promoting and managing recreation, the use of free time, extracurricular education, and P.E. It has the main sports facilities of the municipality, such as the municipal stadium, sports coliseums, sports centers, and community halls. It offers recreation and sports programs for all ages, from early childhood to seniors, with a decentralization strategy by communes to reach all neighborhoods of the city. By addressing this issue through a CLIL-based VLE course, this study seeks to take advantage of IDERF's extensive reach in Fusagasugá and its ability to reach a diverse population through its sports and physical activity programs. Improving the English skills of P.E. teachers would not only benefit students and athletes but also adult and senior participants in IDERF recreation programs. In addition, IDERF has accords at the municipal level with public and private entities, which makes it an attractive destination for athletes in their training process.

Ultimately, it is expected that this initiative will contribute to promoting bilingualism throughout the Fusagasugueño community, taking advantage of the potential of sports and physical activity as means for language learning. By strengthening the English vocabulary of IDERF P.E. teachers through a VLE course based on CLIL, the foundations would be laid for a comprehensive bilingualism program that allows bilingual education to be provided to the city's student population through education, physical training, and sports.

Research Question

What is the effectiveness of a VLE, designed using the CLIL methodology, on English vocabulary learning among P.E. teachers at Instituto Deportivo y Recreativo de Fusagasugá?

General Objective

To quantitatively assess the perceived impact of a VLE course based on CLIL principles on the English vocabulary development of P.E. teachers at IDERF.

Specific Objectives

To identify the key course contents related to P.E. and sports that motivate the P.E. teachers to a useful process of vocabulary learning.

To design a VLE on the Moodle platform based on the CLIL methodology that enriches the vocabulary of IDERF P.E. teachers.

To measure the perceptions and attitudes of the P.E. teachers towards the VLE course and its effect on their English vocabulary learning.

Rationale for the Research Problem

To improve the level of English among students in the municipality of Fusagasugá, it is crucial to implement innovative strategies that allow the language to have a significant impact. One such strategy is to evaluate the perceived impact of a CLIL-based VLE designed to improve P.E. teachers' English vocabulary at IDERF. This is particularly crucial in an English-hostile environment like the current one in the municipality, referring to the difficulty of English learners when everything is in Spanish, where even though public educational institutions offer between 3 and 5 hours of classes per week in the area, many students do not feel comfortable with the subject, and they perceive it as an obligation and a requirement that they must comply with.

This lack of interest in learning English is reflected in the low results of the Saber 11 tests, which highlights the need to implement innovative strategies that generate a positive impact on students, and it is not a secret that P.E. is a subject of great acceptability in the student

population (Hurtado, 2010), therefore by training teachers through a VLE course based on CLIL principles in the development of English vocabulary of P.E. teachers from IDERF can have a significantly positive impact on this subject in state tests, in recent years the level of English has not improved (ICFES, 2021, p. 188). Therefore, I must think about how to achieve the level of English proposed by the Ministerio de Educacion Nacional (MEN) through its "Colombia Very Well" program, whose main objective is for 50% of 11th-grade students to obtain a level B1 (ICFES, 2021, p. 188).

The municipality of Fusagasugá, being a certified territorial entity of Cundinamarca, has not succeeded in obtaining better results in English tests. When analyzing the Saber 11 exams from 2023, it is evident that the vast majority of the educational institutions in the municipality are at the lowest levels (A- and A1) of English language proficiency. Out of the 50 institutions in Fusagasugá, 40 of them were at these basic levels, while only 10 managed to reach level A2, which is still an elementary level of English knowledge [El Instituto Colombiano para la Evaluación de la Educación ICFES, 2020]. These discouraging results reflect the deficiencies that persist in the teaching of foreign languages in the region, despite being a municipality certified in education by the Department of Cundinamarca. The educational authorities must implement effective strategies to strengthen English programs and provide students with the necessary tools to develop solid competencies in this language which is so important in today's globalized world.

Creating this CLIL-based VLE course with IDERF P.E. teachers presents a strategy to strengthen their English vocabulary in a motivating way through P.E. and sports. This allowed to evaluate the perceived impact, the formation of the P.E. teachers through the VLE course, and projects that they can apply the vocabulary learned to eventually bilingualize their classes in the

future. P.E. is an attractive and attitudinally favorable subject for students, as demonstrated by the 87% favorability among students found by Hurtado (2010), this approach does not only provide access to a possible opportunity to improve skills in a second language but does not also take advantage of sports experience to facilitate English language learning.

Rationale for the Methodologies to Address the Problem

The present study adopts a descriptive approach to evaluate the perceived effectiveness of a VLE course, based on CLIL principles, in the development of English vocabulary for P.E. teachers. Descriptive research methods are particularly valuable when the goal is to understand a phenomenon or problem from the perspective of the participants involved (Creswell and Creswell, 2018). In this case, the descriptive approach allows for capturing and describing the current conditions and vocabulary proficiency levels of P.E. teachers, as well as their perceptions of the effectiveness of the VLE course. By employing entry tests, exit tests, and surveys, the impact of the course can be quantitatively measured, providing a clear picture of its effectiveness in improving English vocabulary skills.

The methodological design of the study is carried out in seven stages, allowing for a comprehensive and systematic approach to data collection, analysis, and implementation of the VLE course. The initial stages involve the selection of participants, followed by diagnostic testing to assess their knowledge. The VLE is then designed and implemented, incorporating CLIL strategies and interactive multimedia resources. Subsequent stages focus on exit testing, collection of participant satisfaction data through surveys, and rigorous statistical analysis of the collected quantitative data to draw strong conclusions about the effectiveness of the VLE. This multi-stage approach ensures a thorough and rigorous evaluation of the effectiveness of the VLE

course while providing opportunities for continuous improvement and adaptation based on the findings.

Scope and Limitations of the Study

The scope of this study is limited to IDERF P.E. teachers in Fusagasugá, to strengthen their English vocabulary skills related to their area of specialization. While the ultimate impact is expected on the student population through the implementation of P.E. lessons instructed in English, the study focuses specifically on teacher training. This delimitation of scope is necessary to maintain a clear and manageable focus on the research while addressing a specific need identified in the target population.

Another limitation is that the VLE course focuses exclusively on the development of English vocabulary, without addressing other linguistic skills and subskills such as grammar, listening comprehension, or oral production. While vocabulary is a critical component in language learning (Nation, 2022), it is important to recognize that language skills are interconnected and that a comprehensive approach may be more effective (Schmitt, 2022). Therefore, this research focuses specifically on the technical vocabulary of the P.E. and Sport because it is a CLIL feature to work with a specific context. Furthermore, the study is executed with a specific group of teachers belonging to IDERF, which may limit the generalization of the results to other contexts or populations, However, the findings and implications derived from this research could serve as a basis for future studies in similar environments or as a starting point for the implementation of teacher training strategies in the English language in the field of P.E. and sports.

Literature Review

This chapter presents a comprehensive analysis of CLIL methodology, exploring its application in both P.E. and virtual learning environments. The first section examines four studies that analyze the effectiveness of the CLIL methodology in teaching English in P.E. classes, highlighting its potential to improve students' language skills and engagement. However, challenges related to teacher training and adapting language content to specific students' needs were also highlighted. The second section examines three studies that analyze the effects of integrating VLEs in CLIL courses, concluding that the use of VLEs can significantly improve students' language skills, academic achievement, and motivation.

The following section, provides a theoretical framework for the study, focusing on the CLIL method applied to P.E. It explains why the CLIL method is a more effective pedagogical approach for teaching a subject in a foreign language and explores how the nature of P.E. makes it an ideal subject to apply the CLIL method. The section also discusses a pedagogical theory that supports the use of CLIL in P.E., emphasizing the importance of creating an environment that promotes human interaction and mutual acceptance. The chapter concludes by presenting empirical evidence from previous studies on the effectiveness of CLIL in promoting general linguistic competence and specific achievements in different subjects, providing a comprehensive understanding of the theoretical framework that underpins the study.

State of the Art

This section examines the integration of the CLIL methodology, VLE, and P.E. to teach technical P.E. vocabulary in English. It analyzes previous research on CLIL in VLEs, particularly its impact on language learning and academic performance. Studies comparing experimental groups using CLIL in VLEs with control groups using conventional methods highlight improved listening, , and content acquisition. Additionally, research on CLIL's

application in P.E. classes reveals effective vocabulary strategies, their impact on academic and linguistic outcomes, and motivational factors, alongside inherent challenges. The review also covers the benefits and challenges of integrating VLEs in P.E., emphasizing increased motivation and engagement, teacher training issues, and social interaction limitations· Finally, literature on designing VLEs for English vocabulary learning underscores the need for interactive activities, practice exercises, and structured assessments to enhance vocabulary learning and maintain users' motivation.

CLIL Methodology Applied in Virtual Learning Environments

The study "The Effects of a VLE-supported CLIL Program on Students' Language Learning and Academic Achievement" aimed to examine the effects of a VLE-supported CLIL program on language learning and academic achievement of students. The study was conducted in a primary school in South Korea and was divided into an experimental group that received the VLE-supported CLIL program and a control group that received a conventional English program. The participants were 60 fourth-grade students (30 in the experimental group and 30 in the control group), the CLIL program was implemented through a VLE and focused on natural science content, and an entry test and exit test design was used to measure students' performance in language and natural science. The results showed that the experimental group performed better in English listening comprehension, as well as in natural science comprehension, compared to the control group. Additionally, it was observed that the use of VLE had a positive impact on students' motivation and engagement. Tsai, Y. L., & Shih, C. P. (2020)

Similarly, Dávila-Ramos and Muñoz-Merino (2020) examined the effects of integrating virtual learning environments (VLEs) in CLIL courses in their study titled "Effects of VLE Integration in CLIL Courses: A Comparative Study". The authors compared courses involving

92 university students, divided into two groups: one that received instruction in a CLIL environment with VLEs, and another that received instruction in a non-CLIL environment without VLEs. Data collection was conducted through a survey administered to the students at the end of the course, which focused on their perception of the use of learning technologies integrated into CLIL.

Performance data from students were also used to conduct a comparative analysis. Information was collected through the VLE platform used in the study to analyze the use and effectiveness of online learning activities and resources. Additionally, interviews were conducted with teachers to gather information about their experience with integrating VLEs into their CLIL courses. The results showed that students in the CLIL group with VLE significantly improved their language skills and academic achievement compared to students in the non-CLIL group without VLE. The authors concluded that the integration of VLE in CLIL courses can be an effective tool to enhance student learning in terms of language skills and academic achievement.

García-Sánchez and Redondo-Duque (2017) conducted a study called "Integrating VLEs and CLIL in Higher Education: A Case Study in Computer Science". This study explored the integration of VLE and CLIL in higher education in the field of computer science, where a teaching approach was applied that combined these two methodologies. To achieve this, they used the Moodle platform as a VLE and designed activities that involved students in learning the subject matter and developing their English language skills. In-depth interviews were conducted with participating teachers and students to obtain detailed information about their experiences and perceptions. In addition, questionnaires were administered to students to gather quantitative information about their satisfaction with the integration of VLE and CLIL in higher education and their academic performance. A documentary analysis of course materials, such as

presentations and class notes, was also carried out to better understand how the methodology was implemented. Finally, a participant observation approach was used to collect data during classes and assess the quality of teaching.

The previous studies provide valuable information on the effectiveness of integrating VLE into CLIL courses. However, a gap has been identified in the literature regarding the application of this methodology in the specific context of P.E. Unlike the research analyzed, which had control and experimental groups, the present study will not have a comparison group due to the lack of pre-existing English courses at the institute; however, the findings of these studies suggest that the methodology CLIL can have a positive influence when the topics addressed are of interest to students, either due to personal affinity or due to their relevance to the educational project. This aspect is key since P.E. is an attractive area for many students, which could enhance the effectiveness of CLIL in this context.

Additionally, these studies highlight the usefulness of surveys for collecting data on participants' experiences and perceptions and help to understand the factors that influence the success or limitations of the implementation of CLIL and VLE in the IDERF. Although the existing literature does not specifically address the context of the present study, it provides a solid basis for understanding the potential benefits of the integration of CLIL and VLE, as well as key methodological considerations. These studies attempt to contribute to filling a gap by exploring the application of this innovative methodology in a unique environment, generating knowledge that can guide future implementations in similar contexts.

CLIL Methodology Applied to Teaching English In P.E.

After analyzing the studies examining the integration of VLE into CLIL courses, it is important to explore how this methodology has been applied specifically in the context of

teaching English in P.E. While the use of VLE can improve CLIL results, it is essential to understand how this methodology is implemented in P.E. and the particular challenges and benefits it entails. The following research studies provide a deeper insight into the practical application of the CLIL in teaching English in P.E. classes. Highlighting both its effectiveness and key considerations for successful implementation.

Lo and Lee (2015) analyzed the English vocabulary learning strategies employed by P.E. teachers in a content and language-integrated learning (CLIL) environment to carry out the study, 67 P.E. teachers from a secondary school in Taiwan who were teaching in a CLIL environment were selected. A questionnaire was administered to gather information on the English vocabulary learning strategies used by the teachers, and a regression analysis was subsequently conducted to examine the relationship between the use of these strategies and the effectiveness of English vocabulary learning The results showed that P.E. teachers in a CLIL environment mainly used context-based and repetition-based learning strategies and that the effectiveness of English vocabulary learning was related to the use of these strategies.

In 2017, another study titled "Research on Application of CLIL Approach in College P.E. English Teaching" was conducted by Wang and Wen. This study examined the application of the CLIL methodology to teach English at a Chinese college through P.E. The authors used a mixed approach, which combined a survey with in-depth interviews with P.E. teachers and students. The results of the study indicate that the CLIL methodology can significantly improve students' academic performance in English through P.E. instructed in English. Additionally, students were more interested in learning English through P.E. as they found that the subject matter was more relevant to their daily lives.

Hernández (2019) conducted a study titled "Foreign Language Teaching in the Context of Sports: Analysis of a CLIL Experience in P.E.". With this case study, Hernandez concluded that the CLIL methodology can be effective in teaching foreign languages in the context of sports, as it allows students to improve their language skills while also enhancing their sports skills. However, some challenges in implementing this methodology were highlighted, such as the lack of teacher training in this methodology and the need to adapt the language content to the specific needs of the students.

The study by Ponce de León (2020) analyzed the application of the CLIL method in English teaching in P.E. The research was carried out in a private educational center in Lima, Peru, with a sample of 20 secondary education students and two P.E. teachers. The study was conducted using a single case research design with a qualitative approach. Various techniques, such as participant observation, interviews, and review of documents such as lesson plans and student evaluations, were used to collect the data. The collected data were analyzed using content analysis techniques and presented in the form of detailed narratives. The findings indicate that the CLIL method can be an effective tool for teaching English in P.E., as it provides an authentic and meaningful context for language learning. Students showed greater motivation and engagement in P.E. class when exposed to the English language in a natural and organic way. Furthermore, the study identified several effective strategies and practices for implementing the CLIL method in P.E., such as selecting relevant topics and activities, integrating the English language in instructions and feedback, and collaborating between P.E. and English teachers.

The studies analyzed provide solid evidence of the effectiveness of the CLIL methodology in teaching English in the context of physical education. However, some gaps in the literature are identified that this study could address. While the potential of CLIL is

highlighted to improve the linguistic and sports skills of students, it is necessary to delve into the specific pedagogical strategies that optimize this synergy between language learning and physical development. Some studies mention challenges such as the lack of teacher training and the need to adapt the contents, and linguistic barriers. However, practical solutions to overcome these barriers are not fully explored. This research could contribute valuable knowledge on how to effectively train P.E. teachers in CLIL methodology and how to design contextualized and relevant linguistic materials.

Finally, although the positive impact of CLIL on student motivation and engagement is highlighted, few studies analyze the specific factors that foster this favorable attitude. Better understanding these motivational dynamics could inform strategies to maintain a high level of engagement and enthusiasm in students during the implementation of CLIL in the P.E. The existing literature supports the overall effectiveness of CLIL in teaching English in the P.E. Therefore, this study has the potential to expand knowledge by addressing key gaps related to effective pedagogical strategies, teacher training, materials design and motivational factors. These contributions could significantly improve the successful implementation of CLIL in the specific context of P.E.

VLE for P.E. Teaching

Now that the application of the CLIL methodology in the teaching of English through P.E. has been analyzed, it is time to explore how VLE environments have been specifically integrated in this context. Although CLIL has demonstrated its effectiveness in improving the linguistic and sporting skills of students in the foreign language, the incorporation of VLE could further enhance these benefits by offering a flexible and enriched environment for learning. The

following research studies shed light on the impact of VLE on the teaching of P.E., highlighting both the advantages and challenges that must be addressed for successful implementation.

In Turkey, a study titled "The Effect of Virtual Learning Environments on Attitude and Achievement in P.E." was conducted by Yeniad and Argün (2020). The study investigated the effect of a VLE on students' attitudes and achievement in P.E. The study was conducted with 60 high school students divided into two groups. One group used a VLE and another group used traditional teaching methods. As a data collection method, an attitude questionnaire was applied and students' exam grades were taken to evaluate attitude and academic performance in P.E. The results showed that the group that used the VLE had a more positive attitude toward P.E. and achieved better academic results compared to the group that used traditional teaching methods. Additionally, students in the experimental group expressed that the VLE provided them with a more engaging and motivating learning experience.

The study "Virtual Learning Environments in P.E.: A Systematic Review" by González-Víllora and Pastor-Vicedo, published in the journal Retos in 2020, conducted a systematic review of the existing literature on the use of VLE in P.E. The study aimed to identify the benefits and challenges of using VLE in teaching P.E., the authors conducted a systematic search of articles in electronic databases and found 33 relevant studies that met the inclusion criteria. The results showed that the use of VLE in P.E. can have multiple benefits, including increased student engagement, greater motivation for learning, improved academic performance, and greater satisfaction with learning. However, several challenges were also identified in the use of VLE in P.E., such as the need for adequate training for teachers and students, the lack of social interaction, the difficulty in providing feedback, and the need for a good internet connection and technological devices.

Based on the authors' general conclusions, it can be highlighted that VLEs can play a crucial role as an effective tool to enhance the teaching of P.E. However, they emphasize the importance of adequately addressing the inherent challenges and fully harnessing the benefits derived from the use of technology in the classroom. This strategic approach promotes the successful integration of virtual environments in the educational context, and it also highlights the need for careful management to maximize their positive impact on the P.E. learning process.

Although these studies highlight the benefits of integrating VLEs into the teaching of P.E., such as increased student motivation and engagement, as well as improved academic outcomes, there is a key gap in this research. quantitative attempts to address. The vast majority of existing studies do not specifically focus on evaluating the effectiveness of VLEs for the development of P.E. teachers' own English vocabulary. which is the central objective of this project.

Understand the levels of improvement in English vocabulary related to P.E. content and topics. and sport, through a VLE based on the CLIL methodology, is crucial to determine its usefulness as a teacher training tool. This quantitative study measures the changes in the vocabulary knowledge of IDERF teachers before and after implementing the course on the Moodle platform.

Design of VLEs for English Vocabulary

When analyzing studies examining the use of VLEs in P.E. teaching, it is important to specifically explore the design of these environments for English vocabulary development. Although the general benefits of VLEs have been identified, such as increased motivation and student engagement, it is crucial to understand the most effective strategies and design features for vocabulary learning. The following research studies provide valuable insights into the design

of VLEs specifically focused on English vocabulary acquisition, highlighting key elements such as interactive activities, practice exercises, and evaluation tools.

In 2019, Wattanawaha and Wattanawaha conducted a study in Thailand called "The Development of Vocabulary Learning System in Virtual Learning Environment for EFL Students" to develop and evaluate a vocabulary learning system in a VLE for English as a Foreign Language (EFL) students. The study included different types of activities, such as games, vocabulary exercises, writing exercises, and comprehension tests, implemented in a VLE. To evaluate the effectiveness of the vocabulary learning system in the VLE, a questionnaire, and a vocabulary test were administered, the results showed that the vocabulary learning system in the VLE was effective in improving the vocabulary competence of EFL students. Therefore, the design of VLEs for vocabulary learning can be an effective strategy to improve English skills in EFL students.

The study " Diseño y validación de un ambiente virtual de aprendizaje para el desarrollo del vocabulario en inglés en estudiantes de educación media superior en México" was carried out in 2021 by Pacheco-González and Cruz-Mendoza. For the study, the Moodle platform was used as a VLE, and a set of activities focused on English vocabulary acquisition, such as games, vocabulary exercises, and writing exercises, were developed. The VLE was validated through a questionnaire applied to the students, which evaluated their perception of the effectiveness of the VLE and their learning experience with it. It was found that the designed and validated VLE was effective for the development of English vocabulary in high school students. Additionally, the students showed a positive perception of the effectiveness of the VLE and their learning experience in it. The authors conclude that the design of VLEs for English vocabulary learning

can be an effective strategy for improving English language skills in high school students in Mexico.

The study " Implementación de un ambiente virtual de aprendizaje para la enseñanza del vocabulario en inglés en estudiantes universitarios de Colombia" was conducted by Vargas-Sierra and Dávila-Ramos in 2018. The Moodle platform was used as the VLE, and various activities were developed, such as access to interactive exercises to practice and acquire new words in English. These exercises included identifying words, constructing sentences, and matching words with images. Other types of exercises that students participated in were word games designed to increase their motivation and interest in learning vocabulary, such as crosswords, word searches, and word association games. Reading exercises in English were also developed, in which students had access to English texts of different levels of complexity to read and practice their reading comprehension and acquire new vocabulary. Finally, vocabulary tests were administered in which students completed vocabulary tests to evaluate their progress and ability to retain and use new words in English. The results showed that the implemented VLE was effective in teaching vocabulary in English to university students in Colombia. Additionally, students expressed a good perception of the effectiveness of the VLE and their learning experience in it.

In the three previously exposed investigations, the relevance of VLE and their construction dynamically and attractively can be discerned. These investigations highlight the importance of combining various learning strategies, with the use of games being the most attractive and notable. Furthermore, they demonstrate the effectiveness of the design of VLEs for learning vocabulary in English. The integration of innovative approaches and careful attention to

the structure and dynamics of VLEs highlights the ability of these environments to improve participation and effectiveness in the learning process.

Starting from the State of the art, it provides a strategic direction for the development of the VLE. The recognized importance of VLEs in teaching P.E. underlines the need for a design that effectively adapts to the particularities of this discipline. The emphasis on the learning of English vocabulary in the design of the VLE emerges as an essential component to meet the specific objectives of the project, focusing prominently on the expansion of the vocabulary of IDERF teachers.

When examining the studies reviewed, several central themes and trends emerge that highlight the relevance of integrating CLIL methodology, VLEs, and P.E. Firstly, there is a solid consensus on the effectiveness of CLIL in improving students' linguistic skills when teaching curricular content in a foreign language, specifically in the area of P.E., CLIL demonstrates great potential to promote the simultaneous development of physical and linguistic skills in an authentic and meaningful context.

Secondly, incorporating VLE into CLIL courses has shown to further increase student motivation, engagement, and academic performance. VLEs offer unique opportunities for interactive learning, personalized practice, and continuous formative assessment. However, key challenges are also identified, such as the need to adequately train teachers and address the limitations of social interaction and feedback in virtual environments. Finally, the studies underline the importance of careful design of VLEs for effective English vocabulary learning. Elements such as interactive activities, practice exercises, and well-structured assessment tools are essential to encourage vocabulary acquisition and maintain high levels of student motivation and engagement.

From the review of the literature, it is clear that the integration of the CLIL methodology, the VLE, and the P.E. represents a promising approach to improving foreign language teaching and learning. By combining the learning of curricular content with the development of linguistic skills in an authentic and motivating context such as P.E., CLIL offers a unique opportunity to promote the comprehensive growth of students. However, existing studies reveal a significant research gap regarding the effective application of this methodology in the specific context of PE teacher training.

Understanding teacher motivating factors, effective pedagogical strategies, and optimal VLE design for English vocabulary learning is critical to ensuring successful implementation. Therefore, the present study has the potential to generate valuable insights that can fill this gap and guide future implementations in similar contexts. By addressing the identified gaps, this research can contribute significantly to the field, providing practical information on how to effectively integrate CLIL, VLEs, and P.E. in teacher training. This knowledge can improve the quality of foreign language teaching, foster the professional development of teachers, and ultimately enrich the educational experience of students.

Theoretical Framework

Next, the methodological principles of CLIL are examined in depth, highlighting its relevance for integrating language learning with the acquisition of specific disciplinary knowledge and skills. Furthermore, innovative strategies such as experiential learning, formative assessment, gamification, and data analysis are explored, in order to maximize the effectiveness of the proposed VLE. This theoretical framework lays a solid conceptual foundation to guide the research design, data collection, and subsequent interpretation of the results.

CLIL in P.E Classes

CLIL is a dual-focused educational approach where a foreign language is used as the medium of instruction for teaching subject content (Coyle et al., 2010 cited in Salvador et al., 2018). The core principle behind CLIL is the integration of both language learning and subject-specific content acquisition within the same classroom setting. CLIL emerged as an innovative methodology that challenges the traditional segregated teaching of language skills like reading, writing, listening. As stated by Ruiz et al. (2019), teaching a new language through isolated linguistic skills lacks contextualization and fails to represent authentic communication scenarios where all skills are inherently intertwined. CLIL provides a more naturalistic context for language practice by embedding it within subject matter learning.

The rationale for adopting a CLIL approach in P.E. classes stems from the inherently communicative and interactive nature of sports and physical activities. As highlighted by Salvador et al. (2018), the subject of P.E. is particularly well-suited for CLIL due to its idiosyncrasy, involving communication, human interaction, games, and movement. Numerous authors (Chiva et al., 2015; Coral, 2012; Coral & Lleixà, 2016; García et al., 2012; Hernando et al., 2018; Ramos & Ruiz, 2011) suggest that the cooperative dynamics and interpersonal exchanges that occur during P.E. classes provide an advantageous context for integrating language and content learning.

Furthermore, Wright (2019) argues that authentic communication in P.E. and sports goes beyond only learning vocabulary and grammar. It involves developing specific communicative competencies like active listening, negotiation, persuasion, and conflict resolution - all valuable real-world skills that can be honed through CLIL-based P.E. instruction in the target language. The CLIL methodology allows for a synergistic learning process where students not only

enhance their target language proficiency but also deepen their subject knowledge in P.E. through meaningful communicative interactions. The dynamic and interactive setting of P.E. classes provides an ideal platform to embed language learning within an authentic, contextualized, and cognitively engaging environment.

Characteristics of CLIL Methodology

Integration of Content and Language Learning. Coyle, Hood, and Marsh (2018) mention that the CLIL methodology involves the integration of content and language, which means that students not only learn a foreign language but also acquire knowledge in other curriculum areas in that language, indicating joint planning and teaching of content and language, which allows for greater depth in learning and greater motivation for students. In addition, the authors highlight that the CLIL methodology is based on a communicative approach to language learning, where the goal is to develop students' language competence through authentic communication in real situations.

"Authentic communication in P.E. and sport is not just about learning vocabulary and grammar structures, but about using language as a tool for problem-solving and decision-making in real-world contexts. This involves practicing specific communicative skills such as active listening, negotiation, persuasion, and conflict resolution." (Wright, 2019). The statements of Coyle, Hood, and Marsh (2018) and Wright (2019) indicate that the characteristic of integrated teaching allows for a perfect adaptation to the field of P.E., sports, and foreign languages.

Communicative Approach. Another characteristic of CLIL is its communicative approach. Fortanet-Gómez (2018) points out that the communicative approach is one of the fundamental principles in CLIL methodology. According to the author, the main objective of the communicative approach in the context of CLIL is to promote the effective use of the foreign

language as a communication tool in authentic situations. This involves the practice of specific communicative skills such as oral and written expression, listening comprehension, and interaction so that students can communicate effectively in academic and professional contexts, which again relates to what was said by (Wright, 2019) regarding the practice of communicative skills in sports.

Formative Assessment. A third feature that is considered important in this study is formative assessment in CLIL. According to Coyle, Hood, and Marsh (2010), the aim of formative assessment is to provide feedback to students on their progress in acquiring a foreign language and learning specific content. On the other hand, Dalton-Puffer (2013) emphasizes that formative assessment in CLIL should focus on evaluating the learning process rather than simply evaluating students' final products. Additionally, the author mentions the importance of using multiple forms of assessment, such as peer assessment and self-assessment, to engage students in the assessment process and promote their metacognitive development.

Dalton-Puffer and Nikula (2021) discuss the importance of feedback and self-assessment in formative assessment in the context of CLIL. They also propose effective strategies for implementing formative assessment, such as creating clear and precise rubrics for assessing language skills and specific content. Regarding P.E., formative assessment is also essential for improving the learning process and developing skills. Teachers can use feedback and self-assessment to help students identify their strengths and weaknesses in terms of physical and sports skills and adjust teaching accordingly. Additionally, clear and precise rubrics can be useful for evaluating specific skills in sports, such as throwing technique, speed, and accuracy.

Promotion of Learner Autonomy. Finally, autonomy is identified as a characteristic of the CLIL methodology, which plays a fundamental role in CLIL as it allows students to develop

independent learning skills, comprehension and processing of information in a foreign language, as well as a positive attitude towards learning and greater intrinsic motivation. According to Sancho and Vicente (2022), autonomy is promoted as a development perspective by emphasizing how students can learn to learn and become increasingly independent in their learning. They also discuss how autonomy can be fostered in the CLIL classroom by implementing specific strategies, such as the explicit teaching of critical thinking skills, effective feedback, and the promotion of self-evaluation and reflection.

Language Learning Mediated by Virtual Learning Environments

Moodle Interactivity. Schenck and Cruickshank (2021) discuss how the principles of experiential learning and elaboration theory remain relevant even when implemented through digital platforms and remote learning. They highlight the importance of leveraging technologies to create effective “crafting triggers” through interactive multimedia resources. In the context of this study on a virtual CLIL course for P.E. teachers, according to Schenck and Cruickshank's findings highlight the need to incorporate active learning and experiential tasks even amid the physical and communicative limitations of digital environments. For example, interactive case studies, serious games about conceptual terminology, and demonstration videos, among other teaching strategies that promote experimentation and facilitate the transfer of new English vocabulary to teachers' contexts can be used.

Learning Assessment. Baraña et al. (2015) noted that automated assessment has a high potential for continuous verification of learning and detection of conceptual gaps by students. Interactive questionnaires can be designed at the end of each technical vocabulary module in English, and teachers would have an immediate diagnosis of collective difficulties with certain concepts, for example, when evaluating the contextual use of terms for sports equipment. With

this early feedback, they can reinforce these areas with more examples, practical exercises, and opportunities for meaningful application.

Through learning analytics, the virtual platform can detect individual gaps and assign personalized recommendations for further review and practice. Learning assessment can also be assessed through the concept of game activities, this type of method allows students to learn under the design of serious games personalized with the target terminology, for example, word combination, memory games, crossword puzzles or drag and-. drop games to define terms, to include these elements in the learning evaluation gives the student problem-solving skills applied in their context, by Including game elements in vocabulary tests makes them more interactive and immersive, such as allowing different attempts, by implementing this last strategy teachers will be able to use autonomous learning, which further encourages their motivation in learning.

Motivation and Participation. Alqurshi et al. (2022) talked about the benefits of gamification on motivation, which shows important implications for the design and creation of the VLE for PE teachers. These authors also highlight the results on behavioral and affective commitment found by promoting the integration of serious games focused on practice, which leads to thinking that the application of these strategies to the application of physical education vocabulary as part of the virtual course for teachers will have the same effectiveness. Interactive games where they classify terms according to categories, mini-games of dragging and dropping definitions, or other dynamics focused on strengthening meanings and uses, could keep teachers highly motivated with the feeling of advancing in their knowledge,

Alqurshi et al. also propose the use of medals and points, but even without points and medals, the immersive, experimental, and enjoyable component of these recreational exercises practicing vocabulary would generate greater dedication of time within the platform, beyond

what is strictly requested. This is due to the more positive attitude aroused by the mechanics and challenges of the game, one could expect a high emotional commitment to this pedagogical approach, which facilitates active and permanent learning.

The present theoretical framework has examined in depth the CLIL Learning methodology and its potential application in the design of an innovative VLE for teaching English vocabulary to P.E. teachers. Through a review of the literature, the main constructs, variables, and key elements that underpin this pedagogical proposal have been identified and analyzed. Firstly, it has been established that CLIL constitutes a dual educational approach that promotes the synergistic integration of foreign language learning with the acquisition of knowledge and skills in a specific disciplinary area.

This methodology emerges as a promising alternative to the traditional fragmented teaching of isolated linguistic skills, by providing an authentic and motivating context for contextualized communicative practice. The four principles of CLIL: Content, Communication, Cognition, and Culture, have been analyzed in depth, highlighting their theoretical and practical relevance in the design of the VLE proposed for P.E. teachers. These principles guided the careful selection of motivating thematic content, the incorporation of authentic communicative activities, the promotion of higher cognitive processes, and the integration of elements inherent to the field of sport and physical activity.

Additionally, innovative strategies have been explored to maximize the effectiveness of the VLE, such as experiential and interactive learning through multimedia resources, automated formative assessment, gamification, and learning data analysis. These strategies, supported by the literature, have the potential to foster participants' motivation, active engagement, and meaningful English vocabulary learning. The theoretical framework presented lays a solid

conceptual foundation to guide the research design, data collection, and interpretation of the results. By grounding the study in CLIL methodological principles and best practices supported by empirical evidence, it will contribute to the advancement of theoretical knowledge in the field of language teaching and P.E., while informing innovative and effective educational practices.

The main hypothesis of this research is that a VLE designed under the fundamental methodological principles of CLIL will have a significantly positive impact on the learning of technical vocabulary in English of P.E. teachers. of IDERF. Firstly, it is hypothesized that by applying the principle of Content, presenting a new lexicon contextualized in relevant topics of P.E. and sports, teachers will demonstrate greater acquisition and retention of technical vocabulary in English. The close connection between linguistic concepts and familiar disciplinary content will facilitate more meaningful and lasting learning. Secondly, by incorporating the principle of Communication through authentic oral, written and interactive practice activities situated in real contexts of their profession, as suggested by Wright (2019) given the intrinsically communicative nature of P.E.

Thirdly, by designing the VLE under the principle of Cognition, including cognitively challenging tasks that promote active processing and creative application of acquired knowledge, greater depth and permanence in teachers' English vocabulary memory is expected. Finally, by aligning the VLE with the principle of Culture, incorporating elements of the global reach of the P.E. and sports, it is hypothesized that teachers will show greater motivation and more positive attitudes towards learning vocabulary in English, perceiving it as a valuable tool for their professional performance. By designing a VLE that rigorously integrates the four principles of CLIL, along with innovative interactive learning strategies, formative assessment, gamification

and data analysis, it is expected to comprehensively and significantly optimize the English vocabulary learning process of P.E. teachers. participants.

Vocabulary Learning Evaluated in VLE

Vocabulary in learning a second language is a crucial component to measure the student's progress, who in this case are the IDERF teachers. Several recent studies have explored effective strategies for assessing vocabulary, focusing on key indicators such as comprehension, cohesion, spelling. Zhang and Graham (2020) propose the use of contextualized tasks that require students to demonstrate their understanding of vocabulary in authentic communicative situations, making appropriate use of cohesion and consistency in the use of new words. This approach aligns with the communicative approach applied in CLIL.

Regarding spelling, Choi and Chon (2021) suggest the implementation of digital tools to provide immediate feedback on spelling errors. Their study showed that using real-time spell-check apps not only improves writing accuracy but also encourages learning autonomy. Uchihara and Clenton (2022) propose a multimodal approach that combines listening and reading comprehension tasks. Their research suggests a more complete view of student lexical knowledge, encompassing both passive recognition and active use of vocabulary.

The linguistic skills of listening, reading, and writing are deeply interrelated with vocabulary assessment in second language learning Listening, for its part, implies the ability to understand and process the vocabulary heard in different contexts, evaluated through listening comprehension activities (Parker & Riley, 2010). Reading assesses how students understand and use vocabulary in written texts, which can be measured through reading comprehension tests and text analysis (McNamara & Kintsch, 1996). Finally, writing requires correct spelling and cohesion, evaluated through the production of written texts that demonstrate the appropriate and

varied use of the learned vocabulary (Parker & Riley, 2010). These skills are not only fundamental for a comprehensive vocabulary assessment, but are also mutually reinforcing, thereby improving the student's overall competence in the target language (Li et al., 2015).

The importance of evaluating the following linguistic skills leads to generating 3 indicators to evaluate the success of the vocabulary and make an equivalence between them:

1. Comprehension (Listening and reading)
2. Spelling (Writing)
3. Coherence and cohesion (Reading and writing).

Regarding understanding, Schmitt et al. (2020) argue that "Comprehension, both listening and reading, is fundamental to learning vocabulary in a foreign language. These receptive skills not only allow learners to find new words in context but also facilitate the inference of meanings and the consolidation of newly acquired vocabulary. Repeated exposure through listening and reading is crucial for lexical development and, therefore, for general communicative competence" (p. 105). Çelik and Keser (2021) argue that correctly spelling words is a fundamental indicator of linguistic mastery, especially in academic and professional campuses. These authors maintain that accurate spelling not only improves written communication but also strengthens retention. of vocabulary and deepens the understanding of language structures. For their part, Al-Sobhi and Preece (2022) emphasize the relevance of Spelling in specialized contexts, such as Physical Education. These researchers point out that correctly writing technical terms is essential to developing effective written communicative competence in specific professional fields. Furthermore, they highlight how this skill becomes particularly important in educational approaches such as CLIL.

Crossley et al. (2020) emphasize the importance of these elements in written production, "Coherence and cohesion in technical texts not only demonstrate mastery of specialized vocabulary, but also reflect the learner's ability to organize and connect ideas logically. These skills are particularly crucial in academic and professional contexts where precision and clarity in communication are essential" (p. 103). Coherence and cohesion in the use of technical vocabulary go beyond simple memorization of terms. They involve the ability to integrate this vocabulary into broader discursive structures, which is essential in approaches such as CLIL, where content and language are closely intertwined.

Also, the incorporation of the satisfaction survey as a measurement instrument allows for obtaining valuable data from the participants' perspective complementing the measurements obtained through standardized tests. The results of the survey provided relevant information to explore teachers' perceptions and attitudes towards the VLE course and its effect on the learning of technical vocabulary in English. Furthermore, the data collected through the survey contributed to a comprehensive understanding of the effectiveness of the CLIL approach in this particular context.

Conceptual Framework

The present conceptual framework provides a solid theoretical basis for the study of the effectiveness of a VLE based on the CLIL approach for learning technical vocabulary in English in the context of Physical Education teachers. In this chapter segment, key success indicators, foundational language skills, and their relevance for P.E. as a central discipline are drawn from the theoretical framework and defined. Additionally, the alignment between the assessment instruments is detailed, laying the foundation for the research design, data collection, and subsequent analysis strategies.

Success Indicators in Evaluating the VLE Course for English Vocabulary Development Among P.E. Teachers

Identifying success indicators is crucial for analyzing the effectiveness of the Virtual Learning Environment (VLE) designed with Content and Language Integrated Learning (CLIL) principles. These indicators provide measurable data to assess the impact of the VLE on English vocabulary learning among P.E. teachers at Instituto Deportivo y Recreativo de Fusagasugá. The indicators are teacher satisfaction, ease of use, completion of activities, and test scores. Each of these indicators connects directly to the research objective of quantitatively assessing the perceived impact of the VLE course on English vocabulary development.

Teacher Satisfaction. Rodríguez and Smith (2020) emphasize the importance of evaluating "satisfaction and ease perceived by the participating teachers through feedback surveys." This can be achieved by designing a relevant survey to collect data on participants' perceptions of their experiences with the VLE content. The survey should cover preferences, motivations, and activities that participants find most beneficial to their learning process. This data provides insights into the subjective experience of the teachers and their overall sense of progress in mastering technical vocabulary in English. Satisfaction is a key indicator as it reflects the participants' enjoyment, motivation, and fulfillment of expectations regarding the VLE course. It aligns with the objective of exploring teachers' perceptions and attitudes towards the VLE and its impact on vocabulary learning.

Ease of Use. Ease of use refers to teachers' perceptions of the accessibility and convenience of navigating and interacting with the VLE. This indicator is also evaluated through the satisfaction survey, focusing on specific questions about the ease of access and usability of the platform. Ease of use is essential as it influences teachers' participation and commitment to

the course, which in turn impacts their vocabulary learning. Ensuring the VLE is user-friendly supports sustained engagement and effective learning outcomes.

Activity Completion. Zou and Thomas (2021) highlight the significance of task completion in evaluating engagement and predicting course use. The VLE's design includes a system of prerequisites within the Moodle platform, ensuring that teachers progress through activities sequentially until they reach the final evaluation. Activity completion is measured objectively through this prerequisite system, recording each teacher's progress. This indicator demonstrates the level of commitment and active participation of the teachers, which is crucial for effective learning. High completion rates indicate strong engagement with the course content.

Test Scores. Sánchez-Torres (2021) recommends the implementation of tests to measure mastery of technical vocabulary before and after the course. An entry test identifies the pre-existing vocabulary knowledge of the teachers, providing a baseline. After completing the course, an exit test quantifies and compares progress in learning specific vocabulary, covering receptive and productive skills. These standardized tests offer a solid, comparable, and objective metric of the course's impact on expanding communicative skills in English related to Physical Education. Test scores are a direct indicator of progress and align closely with the research question regarding the effectiveness of the CLIL-based VLE course.

these success indicators are integral to evaluating the VLE course's effectiveness. They align with the research objective by providing comprehensive data on the perceived impact of the VLE on English vocabulary development among P.E. teachers. To ensure robust and reliable evaluation, appropriate instruments, such as feedback surveys and standardized tests, must be utilized to measure these indicators accurately. The test score indicator, in particular, warrants a detailed explanation and justification for the construction of both an entry and exit test. The entry

test establishes a baseline of the teachers' existing vocabulary knowledge, while the exit test quantifies their progress post-course.

Entry and Exit Tests for Vocabulary Assessment

For González and López (2022), a comprehensive process of developing and validating an objective instrument must be carried out to accurately measure the level of technical vocabulary in a specific disciplinary field through standardized tests. This suggests that, to guarantee reliability, the four standard linguistic skills must be adapted to the exclusive use of technical English vocabulary for P.E. teachers. These skills should be measured in both the entry test and the exit test. They also recommend demonstrating evidence of validity and reliability. For this research, it is crucial to show that the four linguistic skills of the English language are effectively assessed. In the VLE, the diagnostic exams evaluate these four skills, thereby strengthening the validity and reliability of the diagnostic results.

Crawford et al. (2020) emphasize the importance of directly aligning the evaluation instruments with the objectives and competencies defined for the course. For this reason, the different activities of the VLE are focused on achieving improvement in linguistic skills, taking into account the level at which the teachers are once the diagnostic tests are completed. This allows for the objectives and competencies of the VLE-based course to be correctly aligned. In this way, it reinforces content validity and generates more useful data on the learning achieved.

Assessment instruments play a fundamental role in this study, as they allow for the valid and reliable measurement of the level of mastery of technical vocabulary in English related to P.E. acquired by teachers through the VLE in CLIL. To this end, a technical vocabulary test was selected. These tests were administered before (entry test) and after (exit test) the VLE course to measure changes in the mastery of technical vocabulary among the participating teachers. Each

test evaluates the four linguistic skills through various types of activities aligned with the disciplinary vocabulary of P.E. The scores obtained in the diagnostic and exit tests allowed to quantitatively evaluate the impact of the CLIL-based VLE course on the improvement of the participants' disciplinary vocabulary in English. By measuring the mastery of technical vocabulary, they contribute to determining the effectiveness of the selected content to motivate learning and allow validating the impact of the VLE designed under the CLIL approach. On the other hand, the results obtained from these tests provide key information to answer the research question and objective effectiveness of the CLIL-based VLE course for learning technical vocabulary in English in the context of P.E. teachers.

Also, the incorporation of the satisfaction survey as a measurement instrument allows for obtaining valuable data from the participants' perspective complementing the measurements obtained through standardized tests. The results of the survey provided relevant information to explore teachers' perceptions and attitudes towards the VLE course and its effect on the learning of technical vocabulary in English.Furthermore, the data collected through the survey contributed to a comprehensive understanding of the effectiveness of the CLIL approach in this particular context.

Rationale of The Research Study on The Literature

The present literature review arises from the need to delve into the application of the Content and Language Integrated Learning (CLIL) methodology in two different environments: P.E. and virtual learning environments. The comprehensive analysis of four studies presented in the first section demonstrates the effectiveness of the CLIL methodology in teaching English in P.E. classes, highlighting its potential to improve students' language skills and engagement. However, challenges related to teacher training and adapting language content to specific

students' needs were also identified. In the second section, three studies analyzing the effects of integrating virtual learning environments (VLEs) in CLIL courses are explored, concluding that the use of VLEs can significantly improve students' language skills, academic achievement, and motivation.

Additionally, a theoretical framework for the study is presented, focusing on the CLIL method applied to P.E. It explains why the CLIL method is a more effective pedagogical approach for teaching a subject in a foreign language and explores how the nature of P.E. makes it an ideal subject to apply the CLIL method. The section also discusses a pedagogical theory that supports the use of CLIL in P.E., emphasizing the importance of creating an environment that promotes human interaction and mutual acceptance.

To carry out this project, it is essential to have a clear understanding of the concepts related to P.E., CLIL teaching, and how they must be adapted to be meaningful in a virtual learning environment. This literature review provides a solid foundation for future research in the field of P.E. and foreign language teaching, highlighting the importance of the CLIL methodology in promoting general linguistic competence and specific achievements in different subjects.

Research Design

This chapter presents a detailed description of the methodological design used in the research. The theoretical foundations that support the methodological decisions made are presented, as well as a solid justification for the choice of each approach and technique used. It begins with a section dedicated to methodological design, in which the key stages of the research process are detailed. Then, the descriptive research method used is addressed, clearly explaining its choice and its alignment with the objectives of the study. The quantitative approach adopted is detailed, justifying its relevance and the techniques of statistical analysis used. The context of the research, the IDERF and its importance in the training of P.E. teachers, as well as the target population and sampling procedures, are described. In addition, the ethical implications, and privacy measures are analyzed. and confidentiality adopted. Finally, the data collection techniques are presented, describing and justifying the instruments used, such as diagnostic tests, surveys and validation procedures.

Methodological Design

The methodological design of this study was developed in 7 systematic stages that guided the research process. This staged approach enabled an evaluation of the effectiveness of the CLIL-based VLE for technical English vocabulary learning for P.E. teachers. The first stages covered the selection of participants and the application of diagnostic tests. The VLE course was then implemented, followed by exit testing and a satisfaction survey to gather participants' perceptions. The final stages focused on the collection, classification, tabulation, and exhaustive analysis of quantitative data obtained through standardized tests and the survey. This methodological design through well-defined stages ensured a systematic process of evaluation,

data collection and analysis, allowing solid conclusions to be drawn about the effectiveness of the CLIL approach in the VLE.

Research Method

This study adopted a quantitative research approach that involves the collection and analysis of numerical data to investigate relationships, test hypotheses, or evaluate the effectiveness of interventions or programs (Creswell and Guetterman, 2019). According to Muijs (2016), quantitative research approaches are characterized by the use of standardized measures, objective data collection techniques, and statistical analysis to examine patterns, relationships, or differences between variables. In the context of this study, a quantitative approach was chosen. For the purpose of objectively assessing the influence of the VLE course on the learning of English vocabulary while examining teachers' attitudes using close-ended survey queries.

The decision to adopt a quantitative approach was based on the research question, which seeks to evaluate the effectiveness of the VLE course designed using the CLIL methodology. As Leavy (2017) notes, quantitative approaches are suitable for evaluating the outcomes or effects of interventions or programs, making them appropriate for evaluating the impact of the VLE course. Additionally, the use of quantitative data collection methods, such as entry and exit tests and surveys with closed-ended questions, aligns with the objectives of obtaining numerical data for statistical analysis. As Creswell and Creswell (2018) highlight, quantitative research methods allow for the collection of data that can be quantified, allowing the use of descriptive and inferential statistical techniques to analyze and interpret the findings. By adopting a quantitative research approach, this study aims to provide objective and measurable evidence of the effectiveness of the VLE course in improving English vocabulary learning among P.E. teachers.

from IDERF, as well as quantifying and analyzing the perceptions and attitudes of teachers towards the course and its impact on their learning.

Research Approach

This study uses a non-experimental descriptive approach framed in the principles of Action Research to evaluate the perceived effectiveness of a VLE course, grounded on CLIL principles, on the development of English vocabulary among P.E teachers. Descriptive research in educational Action Research allows for the capturing of the current conditions and the summarizing of existing phenomena using quantitative measures without attempting to alter the natural setting (Efrat & Ravid, 2013). This is particularly important in documenting the initial and subsequent vocabulary proficiency levels of P.E. teachers participating in the VLE course. By employing entry and exit tests, the course's impact can be quantitatively measured, providing a clear picture of its effectiveness.

Furthermore, action research offers a systematic framework for gathering information and implementing changes based on the findings, which is crucial for improving educational practices and student learning outcomes. As Creswell (2018) emphasizes, action research enables educators to reflect on challenges, collect and analyze data, and enact meaningful changes to their teaching methods. This approach not only addresses local, practical issues within educational settings but also seeks to empower individuals and transform educational practices to better serve the needs of learners. Therefore, by employing a non-experimental descriptive study framed within the principles of Action Research, this study aims to provide valuable insights into the effectiveness of the VLE course on English vocabulary development among P.E. teachers at IDERF.

Descriptive research methods aim to provide a complete portrait of a phenomenon, situation or event by describing its characteristics, behaviors or functions (Nassaji, 2015). According to Creswell and Creswell (2018), descriptive research is useful when the researcher seeks to understand a phenomenon or problem from the perspective of the participants involved. As Hernández-Sampieri and Mendoza (2018) explain, descriptive studies are especially valuable when the research aims to specify the properties, characteristics and profiles of individuals, groups, communities, processes, objects or any other phenomenon that is subjected to analysis.

Data collection in descriptive studies usually involves quantitative techniques, such as surveys, and standardized tests, (Gall et al., 2007) · In this case, entry and exit tests, as well as multiple choice surveys were used to evaluate the level of teachers' vocabulary and their perceptions of the course. It is important to highlight that, although descriptive studies cannot establish causal relationships, they are essential to understanding educational phenomena and lay the foundation for subsequent more explanatory research (Creswell, 2014).

This study has been developed in 7 stages that show the methodological design process. Stage 1 and stage 2 refer to the initial moment of selection of the teachers who participated in the research and the application of an entry test. Then, an intermediate moment was presented that began with the execution of the VLE. In stage 3, an exit-VLE test was applied to evaluate progress. Stage 4 consisted of the implementation of a satisfaction survey to collect participants' perceptions of the experience at the VLE.

Finally, a final moment was carried out that processed the collection, classification, tabulation, and analysis of the data. Stage 6 focused on the organization and processing of the data obtained from the diagnostic and subsequent tests, as well as the satisfaction survey. In stage 7, an

exhaustive analysis of the processed data was carried out to draw relevant conclusions and answer the research questions posed.

Stage 1. The group of 50 participating teachers was selected through an invitation sent to the director of the institute, who in turn conveyed the opportunity to participate voluntarily to the teachers. This methodology was used due to the different schedules of IDERF teachers, which made it difficult to bring them all together in the same place. For this reason, all communications were carried out in this way. The 21 teachers who decided to collaborate with the project were selected according to the following criteria: having at least 3 years of teaching experience, having a basic or zero level of English, and expressing their willingness and willingness to participate. The invitation and confirmation of participation process was carried out in a transparent manner. Initially, an open invitation was sent to all the teachers of the institute through the director. Subsequently, interested parties completed an acceptance form where they expressed their interest, acceptance, and compliance with the aforementioned criteria.

Finally, the 21 selected teachers were provided with detailed instructional videos (see Appendix C) that explained step-by-step how to enter and work in the VLE. These videos aimed to facilitate the understanding and proper use of the virtual platform, ensuring that all participants had the necessary tools to make the most of the activities and resources available in the VLE. In this way, we sought to provide additional support to teachers and guarantee a fluid and effective learning experience during the project.

Stage 2. An initial diagnostic examination called the "entry test" was administered, which consisted of 15 questions in English related to P.E. The assessment focused on three key diagnostic areas of vocabulary: comprehension, spelling, and coherence/cohesion. The selection of these specific areas responds to their close connection with the research objective, aimed at

the design and implementation of an effective VLE to strengthen the technical vocabulary in the English language skills of P.E. teachers. The evaluation of comprehension was evaluated in order to identify areas in which teachers may require additional reinforcement, which will allow specific resources and activities to be designed in the VLE to address these needs. Spelling is also important since correct writing is necessary for the preparation of written materials and assessments. Finally, coherence and cohesion are core aspects of linguistic competence, particularly in written expression, a fundamental skill for teachers in the development of lesson plans, instructions and teaching materials. The results of the entry test provided valuable information about the strengths and areas of opportunity of the participants in these diagnostic areas, which will make it possible to adapt the content and activities of the VLE to address their specific needs effectively. The entry test was administered on the Moodle platform in order to ensure consistency in the application of the tests and data collection.

Stage 3. The implementation of the VLE was based on previous research carried out in 2020 at the institute, which identified the specific needs of teachers in terms of learning English vocabulary in the context of physical education and sports. The findings obtained in that project provided crucial information for the planning and construction of the current VLE (see Appendix C). Furthermore, the theoretical knowledge obtained in this research, related to the CLIL methodology applied in VLE, specifically focused on the P.E. and sports were essential. The VLE was carefully designed for IDERF, incorporating instructional strategies based on the CLIL methodology, such as the integration of P.E. content. With the learning of technical vocabulary in English, attractive and contextualized multimedia resources, such as demonstration videos, interactive animations, and podcasts, were included to present the vocabulary and key concepts in a dynamic and meaningful way.

In addition, various interactive activities adapted to the needs of P.E. teachers were developed, such as thematic vocabulary games, and listening comprehension exercises based on practical situations. These interactive activities allowed teachers to practice and apply English vocabulary in authentic contexts relevant to their professional field. The VLE also included personalized assessment and feedback tools, allowing teachers to monitor their progress and receive specific guidance to improve their English language skills. With this comprehensive approach, the VLE sought to provide effective, contextualized training that would enable physical education teachers to improve their command of English vocabulary and ultimately optimize their ability to deliver instruction.

Stage 4. The implementation of the exit test evaluated the same aspects as the entry test, but with completely different questions. This exam consisted of 15 questions in English related to P.E. and focused on specific diagnostic areas of vocabulary: comprehension, spelling, and coherence/cohesion. The purpose of the exit test is to evaluate progress and changes in mastery of these areas after the implementation and use of the VLE by the participating teachers. By comparing the results of the exit test with those of the entry test, it was possible to determine the effectiveness of the VLE in terms of strengthening the English vocabulary skills of physical education teachers. Better exit test performance in areas such as comprehension, spelling, and coherence/cohesion indicated that the VLE was effective in providing appropriate resources, activities, and strategies to improve these key language competencies.

This comparison allowed us to objectively evaluate the impact of the VLE on teachers' English vocabulary learning, as well as identify areas in which the greatest progress was made and those that might require additional focus or different strategies in future iterations of the VLE. The exit test was conducted using the Moodle platform, ensuring standardized

administration of the exam and consistent data collection. This ensured that the exit test results were comparable and reliable relative to those of the entry test, providing an accurate assessment of the progress and effectiveness of the VLE.

Stage 5. A satisfaction survey was conducted to collect teachers' perceptions of the VLE and its effectiveness in improving English vocabulary in the context of physical education. The survey consisted of 10 questions that addressed key aspects related to acceptability, feasibility, flexibility, motivation, and general perception of effectiveness. The goal of the survey was to obtain direct feedback from participants about their experience with the VLE. The acceptability of the program was evaluated, analyzing how teachers perceived its usefulness and relevance in their professional development. In addition, the feasibility of the program was investigated in terms of accessibility, ease of use, and availability of resources.

The flexibility of the VLE was evaluated considering its adaptability to the individual needs of teachers and its ability to accommodate different schedules and learning styles. Likewise, the motivation of the participants was explored, including their level of interest, commitment and participation during the learning process. Finally, the general perception of the effectiveness of the VLE in improving English vocabulary among physical education teachers was assessed, with the aim of understanding whether teachers considered that the program achieved its objectives and had a positive impact on their language skills.

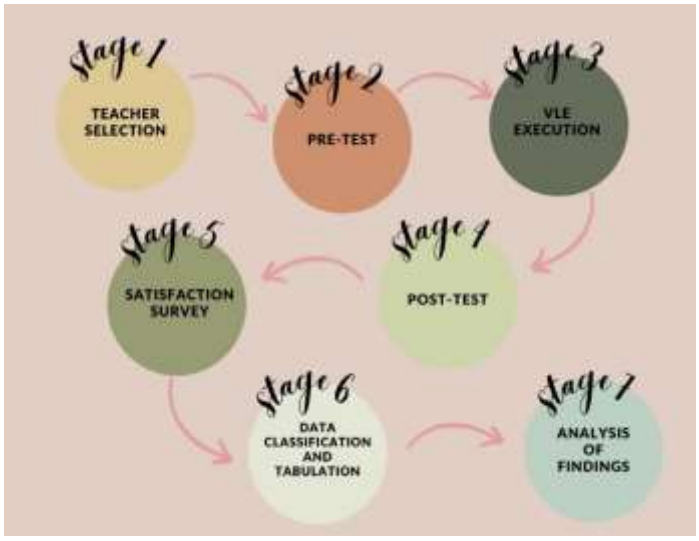
Stage 6. Classification and tabulation: In this stage, the data obtained from the entry test and exit test were classified and coded numerically, with a focus on the diagnostic areas of vocabulary: comprehension, spelling and coherence/cohesion. Additionally, the results were tabulated. quantitative results of the satisfaction survey, which evaluates the acceptability, feasibility, flexibility, motivation and general perception of the effectiveness of the VLE.

To classify the examination data, numerical scores were assigned to participants' responses in each diagnostic area, using a predefined scale. These scores were organized and coded in a database to facilitate comparative statistical analysis between the entry test and exit test. Regarding the satisfaction survey, the quantitative responses to the questions with rating scales were coded numerically and tabulated in the same database. Once classified and coded, the data were entered into statistical software for analysis and visual representation through tables, graphs and figures. Parametric or non-parametric statistical tests were performed, as appropriate, to determine the significance of the differences between the data. entry test and exit test results· In addition, descriptive statistics, such as averages and standard deviations, were calculated to analyze the participants' perceptions reflected in the satisfaction survey.

Stage 7. Analysis of the findings: a descriptive analysis was conducted on the collected quantitative data, focusing on statistical measures such as means, standard deviations, and frequencies. This provided an overview of the English vocabulary levels of P.E. teachers before and after the implementation of the VLE, as well as their perception of satisfaction. subsequently, a comparative analysis of the entry test and exit test results will be performed. The changes in the diagnostic areas of vocabulary (comprehension, spelling, and coherence/cohesion) were evaluated to determine the effectiveness of the VLE in improving the linguistic competencies of the teachers. The responses from the satisfaction survey were also analyzed to identify patterns and trends in the teachers' perceptions of the program.

Figure 1

Stages of the Methodological Design



Note. Own authorship.

Context of the Research

IDERF is a key municipal public entity in Fusagasugá, responsible for promoting and managing recreation, the use of free time, sports and physical education. It has the main sports facilities in the municipality, such as the municipal stadium and sports coliseums. It offers recreation and sports programs for all ages, from early childhood to older adults, with a decentralization strategy by communes to reach all neighborhoods. from the city. One of the challenges that IDERF faces is the lack of continuous training opportunities for its teachers, due to the varied schedules that the institution manages. This has limited the professional development of educators, including the strengthening of their linguistic skills in English. For this reason, they were given the opportunity to participate in this research, offering them the

possibility of improving their level of English, focusing on the technical vocabulary of physical education.

A previous investigation carried out in 2020 determined that the level of the majority of IDERF physical education teachers was at level A1, according to the Common European Framework of Reference for Languages (CEFR). This shows that Fusagasugá faces a significant challenge due to the lack of English proficiency of physical education teachers, which limits the implementation of bilingualism programs in the sports and recreational field. It is important to highlight that IDERF has a population of 70 professionals, of which 42 are physical education teachers. This considerable number of educators in the area highlights the importance of addressing the English training needs of this group, in order to strengthen their linguistic skills and facilitate the implementation of bilingual programs in the sports and recreational context. Recognizing this need, the present study proposed the implementation of a course (VLE) based on CLIL principles, with the objective of improving the English vocabulary of P.E. teachers. of IDERF. This initiative sought to take advantage of the institute's extensive coverage in Fusagasugá and its ability to reach a diverse population through its sports and physical activity programs.

Population

To accomplish research aimed at strengthening the English skills of sports science and P.E. teachers. of the IDERF Institute, the total teaching staff in these areas was taken as the study universe. According to the institution's records, this population was made up of 70 educational officials, who specifically serve as instructors of subjects related to physical activity, sports, and recreation. This group of professionals constituted the key target audience for the development of

strategies that would improve their level of English language proficiency, in order to provide quality bilingual education to students and participants in the programs offered by IDERF.

Sampling

From the universe mentioned above, a segmented sample of 21 teachers qualified in the area of sports sciences and physical education was selected. This sample represents a significant proportion of the teaching staff in these disciplines, which allows for obtaining a high degree of reliability in the research results. As they are professionals with specific training in the field of sports and physical activity, their participation guarantees the relevance and applicability of the strategies developed to strengthen their linguistic skills in English. Furthermore, as it is a representative sample, the findings and conclusions derived from this study can be extrapolated with greater precision to the entire universe of teachers in these areas within the IDERF.

Research's Impact

The present study sought to generate a significant and lasting impact on the education and training of P.E. teachers. of IDERF, as well as in the promotion of bilingualism in the community of Fusagasugá. The results and findings derived from this research are expected to contribute positively in several key aspects:

1. Strengthening the English language skills of physical education teachers: The VLE based on the CLIL methodology aims to significantly improve the English vocabulary and communication skills of educators in the field of sports and physical activity. This will allow them to provide quality teaching in a bilingual environment, directly benefiting students and participants in IDERF programs.

2. Promotion of bilingualism in the sports and recreational field: By strengthening the English skills of physical education teachers, the foundations were laid to implement bilingual

programs in the sports and recreational field of Fusagasugá. This will contribute to promoting bilingualism in the community, taking advantage of the potential of sport and physical activity as a means of language learning.

3. Professional development and career opportunities: Improving the English level of IDERF teachers will provide them with greater opportunities for professional and career development. They will be able to access specialized training programs, participate in international events and, in general, expand their professional horizons in an increasingly globalized world.

4. Pedagogical innovation and adoption of educational technologies: The design and implementation of the CLIL-based VLE encouraged the adoption of innovative approaches and the use of educational technologies in the context of language teaching. This can serve as a model for other teacher training institutions and programs, driving the transformation of pedagogical practices.

5. Contribution to scientific knowledge: The results of this research contributed valuable knowledge to the field of language teaching through integrated approaches such as CLIL. In addition, insights will be generated on the design and development of effective VLEs for teacher training in specific contexts.

Importantly, to maximize the impact and ensure the integrity of the study, steps were taken to mitigate potential biases, power dynamics, and ethical considerations that may influence the results. This includes maintaining the confidentiality and anonymity of participants, establishing informed consent processes, training staff in ethical aspects and scientific integrity, and implementing feedback mechanisms.

Ethical Protocol

Risk. The risk of this is categorized "without risk" because the study was applied to teachers of a study institution interested in obtaining benefits from the research and being able to apply a step-by-step method that would improve the uses of English in their learning processes. teaching, the survey was applied anonymously, which allows transparency and greater participation of teachers in the information that determines the diagnosis, of the inconveniences that could present in the process of collecting information could be the impact that some teacher has on others trying to influence the answers of the others, a situation that is mitigated by applying the survey in isolation and in different time and place scenarios for each of them. The first collection step prior to the collection process is expected to disclose the meaning of the research, its importance, and the benefits of the data obtained, taking advantage of this moment to sign the informed consent that allows clarifying these aspects.

Benefits. The fundamental purpose of this research is to optimize the use and level of English language proficiency in physical education and sports teachers. Through a comprehensive approach, we seek to provide these professionals with the linguistic and methodological tools necessary to fluidly and effectively incorporate English as a second language into their usual teaching practices. This initiative takes on special relevance by recognizing the growing emphasis on bilingual education and the importance of promoting language learning from an early age. By improving teachers' skills in English, it is expected that they will be able to transmit with greater confidence and precision the concepts and knowledge of their disciplines, thus enriching the educational experience of students. As a direct consequence, it is anticipated that the student population will benefit from receiving quality

instruction in a bilingual environment, which will allow them to develop communication skills in the second language naturally.

Participation- Privacy and Confidentiality. The teaching staff is free to participate in the study project, to guarantee the aforementioned, the teachers receive an informed consent (See Appendix C) detailing the aspects of participation and withdrawal if they wish to do so at any time. To guarantee the privacy of the information received, a questionnaire-type survey was designed with multiple-choice closed-type questions that were executed through Google Forms, sharing with the participants a link that directs them to the pre-established survey, which was open for a period of time. Period of 8 days in search of greater participation that grants reliability in the information collected, the questionnaire did not request Names and Surnames, nor any type of Identification, in addition to doing it asynchronously, it allows the teacher to carry out the activity from the privacy of your home if they so wish, for these two aforementioned points each participant was guaranteed total privacy in conducting the surveys and total anonymity.

Describing Dissemination and Information Guarantee. The study aims to develop a virtual learning environment for the teaching of degrees in English for P.E. teachers, disseminating the work in stages where, in the first place, Identifying the thematic keys related to P.E. and sport that be useful for the process of acquiring the second language, developed through a survey where the participants act independently, avoiding possible deviations in the information collected, giving way to a second stage that consists of preparing a course study program in the English language that allows teaching for specific purposes in the sports field. science program and ending with the development of a virtual learning environment in which the English language teaching degree curriculum is developed for teaching with specific purposes in the sports science program. Given that a reliable tool (Google Forms) was used, a reasonable

amount of time, and a wide disclosure of the study to the participants, this combination allows us to guarantee results that can be trusted for an accurate diagnosis of the subject to be treated.

Data Management and Analysis. Once the information was obtained, it was stored in a Drive to which only the researcher has access and will not be shared with any IDERF personnel, again guaranteeing privacy. If the results were shared in a general way once the analysis was done, the data was tabulated, then graphs were generated to be able to analyze the information in a more effective way, and the data wasn't manipulated in any way for the benefit of the investigation. To analyze the information received from the surveys, a previous analysis was carried out question by question, in which a count of the number of responses was made for each of the responses, and obtaining a result that showed an analysis in the first instance, a Once this process is completed, the answers will be sub-grouped, to determine the relationship between the four linguistic skills and conclude the general level of English of the population sample, and it culminated with a descriptive analysis that allows giving recommendations of the results. found during the analysis of the surveys.

Procedures.

- Request permission from the director of IDERF to carry out the investigation.
- Meeting with the study population and explanation of its scope.
- Signing of informed consent to participate in the project.
- Application of the pre- and exit tests.
- Application of the survey.
- Tabulation of the results obtained.
- Analysis of the results.

Data Collection Techniques

To obtain reliable and valid data to comprehensively evaluate the effectiveness of CLIL-based VLE for learning technical vocabulary in English, a combination of quantitative data collection techniques was used. This section details the instruments used, including vocabulary tests. before (entry test) and after (exit test) of the course, as well as a satisfaction survey applied to the participants. The joint use of these instruments made it possible to triangulate the information collected, obtaining objective measures of the mastery of technical vocabulary, at the same time that the perceptions and attitudes of P.E teachers towards the learning experience in the VLE with a CLIL approach were explored.

Description and Rationale of the Instruments

Entry Test. The entry test (see Appendix E) was an initial diagnostic examination consisting of 25 questions in English related to P.E. The evaluation was focused on specific diagnostic areas of vocabulary: comprehension, spelling, and coherence/cohesion. The questions were designed to assess the knowledge and competence of teachers' technical vocabulary in this area before the implementation of the VLE. The entry test is to establish an initial measurement of the teachers' level of proficiency in English vocabulary within the context of P.E. By assessing their competence in comprehension, spelling, and coherence/cohesion, Brown, H. D. (2004) argues that entry tests are essential for gathering information about students' level of competence before implementing teaching and learning programs. This allows for the identification of specific areas that need improvement and adapting the VLE accordingly for the IDERF teachers. Furthermore, according to Bachman, L. F., & Palmer, A. S. (2010), they emphasize the importance of entry tests in establishing a reference point and evaluating students' progress in

language learning. Therefore, the entry test also enables a comparison with the results of the exit test to assess the effectiveness of the VLE in enhancing teachers' language skills.

Exit Test. The exit test (see Appendix F) was conducted after the implementation of the VLE and served as a follow-up evaluation to the entry test. It consists of 15 English questions that are different from those in the entry test but still related to P.E. Similar to the entry test, the exit test assesses the teachers' vocabulary skills in comprehension, spelling, and coherence/cohesion. The purpose of the exit test is to measure the impact of the VLE on the improvement of teachers' English vocabulary. By comparing the results of the entry test and exit test, we can determine the effectiveness of the VLE in enhancing the linguistic competence of teachers in the specific area being evaluated. The exit test also provides valuable data for assessing the overall success of the VLE implementation and identifying any areas that may require further attention or adjustments.

Bachman, L. F., & Palmer, A. S. (2010) emphasize the need to evaluate students' progress through post-instruction tests to gain a more comprehensive understanding of skill development. Therefore, by comparing the results of the entry test and exit test, we can determine the effectiveness of the VLE in improving teachers' vocabulary competence in the specific area being evaluated. Fulcher, G. (2015) highlights that exit tests are essential for evaluating the development of language skills and providing information to improve teaching and learning programs. Based on the author's assertion, it can be deduced that the exit test also provides valuable data for assessing the overall success of the VLE implementation and identifying any areas that may require further attention or adjustments.

Survey. The survey (see Appendix G) was a questionnaire designed to gather feedback from participating teachers regarding their perception of the VLE and its effectiveness in

improving their English vocabulary in the context of P.E. The survey consisted of 10 questions addressing key aspects such as acceptability, feasibility, flexibility, motivation, and overall perception of effectiveness.

The survey aims to obtain direct feedback from teachers about their experience with the VLE. By assessing their perceptions of the program's acceptability, feasibility, flexibility, and motivation, the aforementioned relates to Borg, S. (2013) as the author mentions that surveys are useful for collecting data on the acceptability and effectiveness of language teaching programs from teachers' perspectives. Furthermore, Farrell, T. S. C. (2015) states that surveys are a valuable tool for teachers to express their opinions on the effectiveness of a language teaching program and its impact on their professional development. Therefore, the survey also provides an opportunity for teachers to express their opinions on the overall effectiveness of the VLE and its impact on their technical vocabulary and language skills. For the collection of primary data in a research project, we proceed by 3 methods: observation, surveys, and finally experimentation. Torres, M., Paz, K., and Salazar, F. G. (n.d.), to carry out the research, we proceeded to work with the questionnaire type survey, closed question, multiple-choice type, the survey that was proposed to obtain the required information has 10 questions that are the following (along with their respective response options).

Application Mode

Both the entry test and exit tests were administered within the Moodle platform, where the VLE is located (see Appendix C). Teachers logged in to the Moodle platform using their credentials and accessed the designated sections for the entry test and exit test. The tests were presented in an online format, allowing teachers to answer the questions directly on the platform. Moodle ensures standardized administration and consistent data collection for both the entry test

and exit test. The survey was conducted using Google Forms. A link to the survey was shared with the participating teachers, who can access and complete it online. Google Forms provides a user-friendly interface for respondents to answer the survey questions.

Validation Procedures

Criterion Validity. A comparison of the results of the entry test and the exit test was carried out to evaluate the effectiveness of the VLE in improving teachers' linguistic competence in the specific area evaluated. Significant correlations were sought between the scores obtained at both assessment points to determine if the VLE had a positive impact on teachers' English vocabulary. To establish criterion validity, the following steps were followed:

1. An entry test was administered to participating teachers before the implementation of the VLE to assess their initial level of language proficiency in the specific area.
2. After completing the VLE training program, a exit test was administered to the same teachers.
3. Statistical analysis was performed to compare entry test and exit test scores, using comparative statistical significance testing.
4. Comparation between the entry test and exit test scores were calculated to determine the strength of the relationship.
5. Significant and positive comparations were found between the entry test and exit test scores, and the exit test scores were significantly higher than those of the entry test, therefore it was concluded that the VLE had a positive impact on the improvement of teachers' linguistic competence in the specific area evaluated.

6. In addition, a perception survey was applied to teachers to evaluate their experience and satisfaction with the VLE. This survey included questions about ease of use, quality of resources, effectiveness for learning, and other relevant aspects.

Tabulation and validation of the sample. The tabulation and validation of the sample in the project were carried out using the Excel program, focusing on the data collected through the entry test, exit test and survey. Once the data from the participants was collected, the tabulation was carried out in Excel. It involves organizing the data in a clear and structured format, assigning each variable to a column and each response to a corresponding row. After tabulation, the data were validated to ensure its quality and reliability. through a thorough review to identify possible errors, missing data or inconsistencies in the records. Using Excel tools and functions, data cleaning procedures were applied to correct any identified issues and ensure the integrity of the data collected.

Once the data has been validated, statistical analysis can be performed in Excel to examine the results of the entry test, exit test, and survey. Descriptive statistics can be calculated to summarize the participants' responses in each instrument. Additionally, comparisons can be made between the entry test and exit test results to evaluate the impact of the program on the development of English vocabulary skills among the teachers. The survey responses can also be explored to gather information about the participants' perception and satisfaction regarding the implemented virtual learning environment.

Data Analysis and Findings

This chapter examines the effectiveness of VLE designed with CLIL methodology to improve the English vocabulary of P.E. teachers. from the IDERF of Fusagasugá, implementing a 4-6-week online course. Four key indicators were assessed: coherence and cohesion, spelling, and comprehension using entry and exit tests. In addition, a satisfaction survey was applied to analyze the participants' perception of online learning and the content of the VLE based on the CLIL.

Data Management Procedures

According to Krzywinski, M., & Altman, N. (2023). Descriptive statistics help identify patterns, trends, and anomalies in data using various methods, such as measures of central tendency, Therefore, to perform a descriptive analysis of the entry and exit test results and evaluate the impact of the Environment program. Virtual Learning (VLE) in improving the vocabulary skills of physical education teachers, several methods and detailed analyses were followed that provided a comprehensive and objective view of the collected data as follows:

1. Histograms were created for the scores obtained in the entry test and the exit test. These histograms allowed us to observe the distribution of the scores and visualize that, in general, the scores in the exit test were higher than in the entry test.
2. A hypothesis test (Shapiro-Wilk test) was conducted to check whether the scores obtained on the entry test and exit test followed a type of distribution called the "normal distribution." According to Derrick et al· (2021), the Shapiro-Wilk test is widely recommended to evaluate the normality of data, especially for small and medium-sized samples.

3. A hypothesis test (Wilcoxon test) was carried out to check if the difference between the average score obtained in the entry test and the exit test was significant. The Wilcoxon test is a non-parametric test suitable for comparing two related samples when they do not meet the assumption of normality (Krzywinski & Altman, 2023).
4. A box plot was created for the entry test and one for the exit test, which allowed us to observe that the scores on the exit test were closer to each other than on the entry test (the project had a leveling effect among the participants).
5. The mean increase in the result of the exit tests was compared to the entry tests using the Wilcoxon test to see which questions the mean difference in results was significant and which were not.

To analyze the results of the survey in the context of this research, a descriptive approach was used, which is based on the collection of data through a questionnaire with closed questions. According to researchers such as Smith and Johnson (2023), descriptive analysis is an effective technique for summarizing and describing the characteristics of a data set, in this case, the responses of participating teachers. This method allowed to examine the patterns and trends present in the teachers' responses, as suggested by Jones and Brown (2023). In addition, the descriptive analysis provided valuable information about teachers' perception of the Virtual Learning Environment (VLE) and its effectiveness in improving English vocabulary in the field of P.E. By using descriptive analysis, it was possible to present the data in a clear and understandable way, as emphasized by Davis and Wilson (2023). This facilitated the interpretation of the results and the effective communication of the findings obtained through the survey. Additionally, the descriptive analysis offered relevant information to support informed

decision-making and continuous improvement of the VLE, this process included the creation of graphs and tables, which helped visualize and better understand the data collected.

Results

Categories

Based on the results obtained, the following three categories have been identified: Online Learning, VLE content, and Vocabulary learning. The first two categories were identified based on a satisfaction survey administered to the teachers, while the third category was identified based on the results of the entry and exit test administered to the participants. This study aims to assess the effectiveness of the VLE English course for P.E. teachers in improving the English language skills of the participants, specifically in the area of vocabulary acquisition, through the implementation of a VLE.

Table 1

Emerging Categories Chart

	Categories	Indicator
What is the effectiveness of a VLE, designed using the CLIL methodology, on English vocabulary learning among P.E. teachers at Instituto Deportivo y Recreativo de Fusagasugá?	Online learning	Acceptability
		Flexibility
		Viability
	VLE Content based on CLIL.	Motivation
		Effectivity
	Vocabulary learning	Comprehension
		Spelling
		Coherence and cohesion.

Note. This table shows the emerging categories.

Discussion of Categories

Online Learning. the first category emerges from the acceptability of online learning for the teachers of IDERF, according to George Siemens' (2004) theory of connectivism, online learning is essential for the future of education due to the transformation of the way we learn thanks to technology.

Online learning presents multiple benefits over traditional classroom instruction. On the one hand, it allows for more interactive and engaging learning thanks to the use of multimedia tools such as videos, audio, or interactive simulations. On the other hand, it facilitates access to education at any time and place, breaking down geographical and temporal barriers. In addition, online learning adapts to individual students' needs, offering more personalized learning, at their own pace, and in the way they prefer.

While it is true that there are criticisms and concerns about the quality of online learning and the possible lack of social interaction, Siemens believes that good planning and design can overcome these obstacles and maximize the advantages of online learning.

Table 2

Online Learning Answers Category.

Questions related to online learning	Teacher percentage
Do you agree, based on your experience, that online learning has allowed for greater flexibility in terms of study schedules and locations?	76% of the students either totally agreed or agreed, while 24% remained neutral.
Do you consider, based on your experience, that online learning can be a good option for people with busy work schedules and limited time to devote to education?	81% of students completely agreed or agreed, while 19% were neutral.

Do you think that online learning can be a viable alternative for people living in remote geographic areas or facing difficulties in commuting to a traditional physical campus?	76% of students totally agreed or agreed and 19%, considered neutral, and 5% were disagree.
Based on your experience, do you believe that online learning can be as effective as traditional classroom instruction?	81% of the students totally agreed or agreed and 19% considered neutral.
Based on your participation in the online course, do you believe that autonomy and self-discipline are essential aspects to be successful in this type of educational modality?	95% of the students totally agreed or agreed and 5% considered neutral.

Note. This table shows the results of the questions related to online learning.

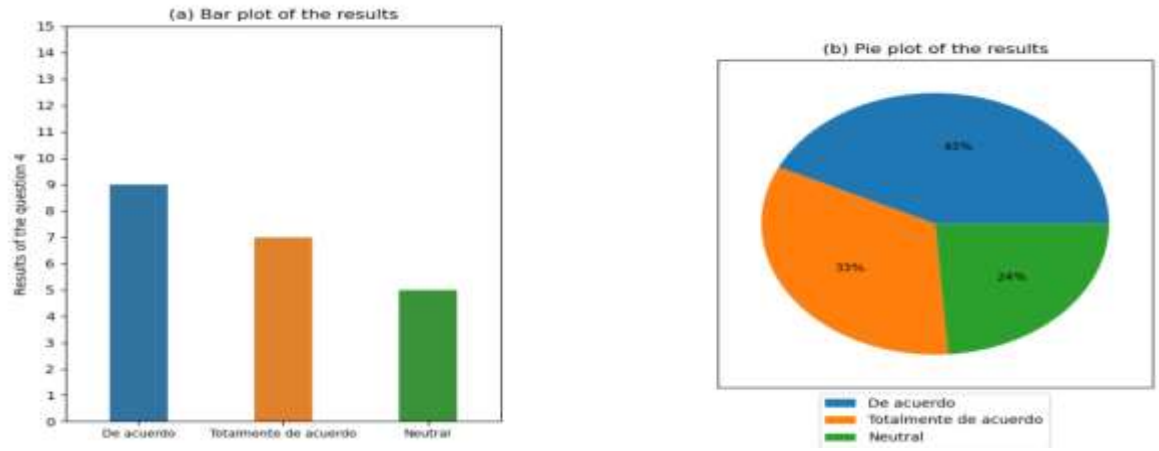
It is interesting to note how the satisfaction survey conducted in the study showed that teachers found benefits in the use of the VLE in terms of flexibility and convenience for their learning. This coincides with the findings of the 2018 Columbia University study, which suggests that online learning can be an excellent option for those with busy schedules and limited time to devote to education.

It is important to highlight that the accessibility to high-quality education programs from anywhere with an internet connection can be a great advantage for those living in remote areas or without access to on-site educational programs. Additionally, the elimination of the need to travel to a physical campus can be an effective way to save time and money. The results suggest that the use of the VLE can provide a series of benefits for P.E. teachers, including flexibility and convenience in learning, accessibility to high-quality educational programs, and elimination of

the need for physical travel. Below can see the results of the satisfaction survey in the questions focused on the online learning category:

Figure 2

Survey Question 1



Note. Do you agree, based on your experience, that online learning has allowed for greater flexibility in terms of study schedules and locations?

Table 3

Survey Question 1

Answers	Amount of answers	Percentage
Completely agree	9	33%
Agree	7	43%
Neutral	5	24%
Disagree	0	0%
Completely disagree	0	0%

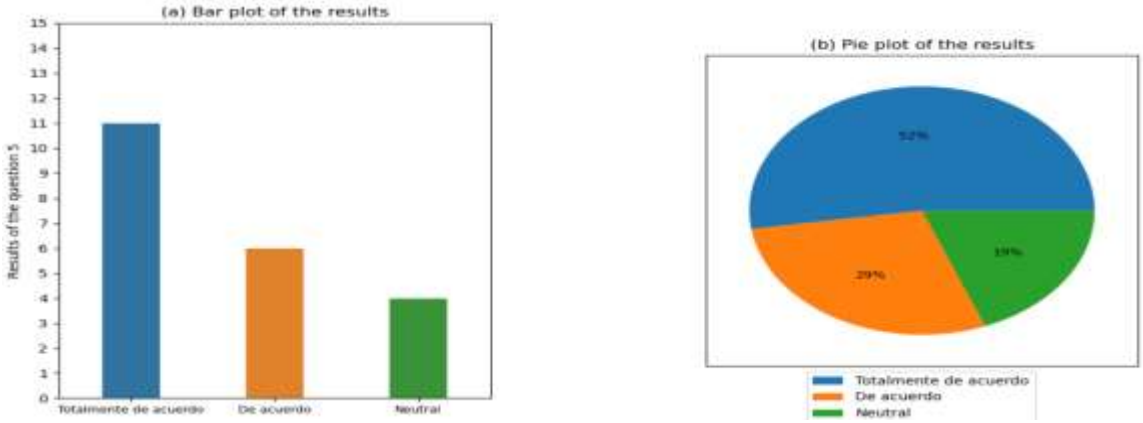
Note. *This table shows the results of the experiences of online learning with respect to flexibility. Question 1: Do you agree, based on your experience, that online learning has allowed for greater flexibility in terms of study schedules and locations?*

Table 3 and Figure 2 analysis. The data obtained reveals that 33% of the surveyed teachers responded "COMPLETELY AGREE" when asked if they agree that online learning has allowed for greater flexibility in terms of study schedules and locations. Additionally, 43% of the participants expressed their agreement with the statement by selecting "AGREE," while 24% opted for the "NEUTRAL" option in this assessment. It's worth noting that no responses were recorded in the "DISAGREE" or "COMPLETELY DISAGREE" categories.

The results indicate that the vast majority of respondents perceive that online learning has allowed for greater flexibility in terms of study schedules and locations. This suggests that students (teachers) find benefits in being able to study online, which allows them to adapt to their personal and professional schedules and circumstances, It is important to note that the respondents' opinions may be based on their personal experience with online learning, as they may have discovered that they can study at times that suit their work and other commitments. In addition, the opinion may be influenced by the characteristics of the online course, such as the ability to access course material anytime and anywhere, which gives teachers the opportunity to study at their own pace.

Figure 3

Survey Question 2



Note. Do you consider, based on your experience, that online learning can be a good option for people with busy work schedules and limited time to devote to education?

Table 4

Survey Question 2

Answers	Amount of answers	Percentage
Completely agree	11	52%
Agree	6	29%
Neutral	4	19%
Disagree	0	0%
Completely disagree	0	0%

Note. This table shows the results of the advantages of online learning with respect to busy work schedules and limited time to devote to education. Question 3: Do you consider, based on your experience, that online learning can be a good option for people with busy work schedules and limited time to devote to education?

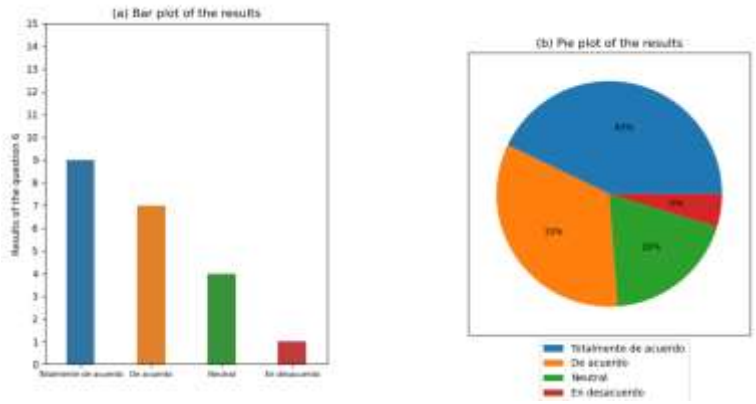
Table 4 and Figure 3 Analysis. The data indicates that 52% of the respondents answered "COMPLETELY AGREE" when asked if they consider, based on their experience, that online learning can be a good option for individuals with busy work schedules and limited time for education. Additionally, 29% of the participants expressed their agreement with the statement by selecting "AGREE," while 19% opted for the "NEUTRAL" option in this assessment. It is important to note that there were no responses in the "DISAGREE" or "COMPLETELY DISAGREE" categories.

These results suggest that the majority of respondents consider online learning to be a good option for people with busy work schedules and time constraints. The opinion may be

influenced by each individual's personal experience with online learning, as well as the specific characteristics of the online course in question. Furthermore, the neutrality of some respondents may be due to a lack of sufficient experience with online learning to take a clear stance. Overall, the results indicate a positive perception of online learning as a viable alternative for people with busy schedules and time constraints.

Figure 4

Survey Question 3



Note. Do you think that online learning can be a viable alternative for people living in remote geographic areas or facing difficulties in commuting to a traditional physical campus?

Table 5

Survey Question 3

Answers	Amount of answers	Percentage
Completely agree	9	43%
Agree	7	33%
Neutral	4	19%
Disagree	1	5%
Completely disagree	0	0%

Note. This table shows the viable alternative perspective with respect to people who live in difficult places of presential access. Question 3: Do you think that online learning can be a viable

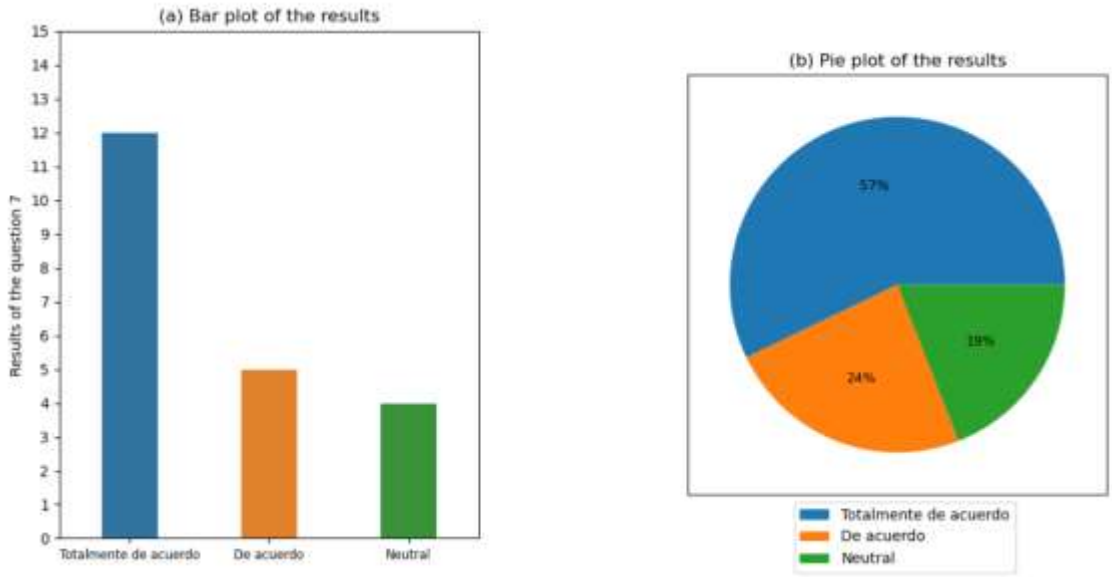
alternative for people living in remote geographic areas or facing difficulties in commuting to a traditional physical campus?

Table 5 and Figure 4 Analysis. The data shows that 43% of the surveyed teachers responded "COMPLETELY AGREE" when asked if they believe that online learning can be a viable alternative for people living in remote geographic areas or facing difficulties in commuting to a traditional physical campus. Additionally, 33% of the participants expressed their agreement by selecting "AGREE," while 19% chose the "NEUTRAL" option in this assessment. It's important to note that 5% of the participants disagreed by selecting "DISAGREE," but there were no responses in the "COMPLETELY DISAGREE" category. It can be observed that a significant portion of the participants, a total of 76% (43% completely agree and 33% agree), consider online learning to be a viable alternative for individuals in remote geographic areas or facing commuting difficulties. 19% of the participants fell into the neutral category, and only 5% disagreed. No responses indicated complete disagreement. These results reflect a generally positive perception of online learning as a suitable option for those with geographical or commuting challenges.

Online education offers a flexible and accessible learning experience, allowing students to study from anywhere with an Internet connection. This option is particularly important for people living in remote areas or facing difficulties commuting to a traditional physical campus. The survey results suggest that respondents view online education as an effective way to overcome these challenges, enabling them to access quality education from anywhere and at any time.

Figure 5

Survey Question 4



Note. Based on your experience, do you believe that online learning can be as effective as traditional classroom instruction?

Table 6

Survey Qustion 4

Answers	Amount of answers	Percentage
Completely agree	12	57%
Agree	5	24%
Neutral	4	19%
Disagree	0	0%
Completely disagree	0	0%

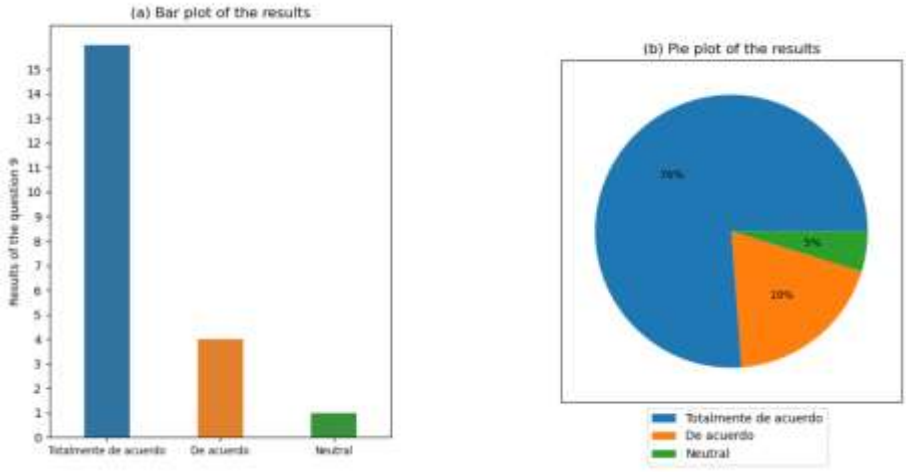
Note. This table displays participants' perceptions of the effectiveness of online learning in comparison to traditional classroom instruction.

Table 6 and Figure 5 analysis. According to the survey results, it reveals that 57% of the surveyed teachers responded "COMPLETELY AGREE" when asked if they believe that, based on their experience, online learning can be as effective as traditional classroom instruction. Additionally, 24% of the participants expressed their agreement by selecting "AGREE," while 19% opted for the "NEUTRAL" option in this assessment. It's important to note that there were no responses in the "DISAGREE" or "COMPLETELY DISAGREE" categories. In summary, a majority of the participants, totaling 81% (57% completely agree and 24% agree), believe that online learning can be as effective as traditional classroom instruction based on their experience. 19% of the participants fall into the neutral category. There were no responses indicating disagreement. These results reflect a strong positive perception of the effectiveness of online learning compared to traditional classroom instruction.

These results suggest that, overall, respondents have a positive perception of the effectiveness of online learning. However, it is also possible that respondents have had positive previous experiences with online education, which influenced their responses. Additionally, the effectiveness of online learning may depend on specific course and student factors, such as content, technology, and learning style. Overall, the survey results indicate a positive and optimistic view of the effectiveness of online learning as a viable alternative to traditional classroom instruction.

Figure 6

Survey Question 5



Note. Based on your participation in the online course, do you believe that autonomy and self-discipline are essential aspects to be successful in this type of educational modality?

Table 7

Survey Question 5

Answers	Amount of answers	Percentage
Completely agree	16	76%
Agree	4	19%
Neutral	1	5%
Disagree	0	0%
Completely disagree	0	0%

Note. This table shows the perception of autonomy and discipline with respect to online learning.

Table 7 and Figure 6 Analysis. The results of this survey suggest that the vast majority of participants, a total of 95% (76% completely agree and 19% agree), believe that autonomy and self-discipline are essential aspects to be successful in this online educational modality. Only a small percentage, 5%, falls into the neutral category, and there were no responses in the

"DISAGREE" or "COMPLETELY DISAGREE" categories. This indicates that most participants recognize the importance of autonomy and self-discipline in the context of online learning, suggesting that they perceive personal responsibility as fundamental for success in this educational environment.

This could indicate the trending perception among educators that autonomy and self-discipline are crucial factors for success in online education and support the notion that students possessing these skills have greater chances of achieving their educational goals in this environment.

VLE Content. The second category emerges from the data analysis, based on the teachers' perspectives and how they felt during the course development, whether they considered their learning to be significant from their point of view, whether the course development allowed them to improve their vocabulary in a fun and engaging way, and if they consider the topics covered to be significant for the professional development of their career, obtaining results very similar to those found in the research "Designing a virtual learning environment for Content and Language Integrated Learning (CLIL) in higher education: the authors' experiences" by authors J. García, R Ruiz, and C. Álvarez (2015), which determined that the designed VLE was effective in promoting integrated content and foreign language learning, as well as improving student motivation and commitment. They also emphasized the importance of the active involvement of both teachers and students in the VLE design process to ensure its success and usefulness.

Table 8

CLIL Methodology Answers Applied in the VLE.

Questions related to CLIL methodology in the VLE.	Teacher percentage
Do you consider that the topics covered in the course are meaningful for the professional development of your career?	52% of the students considered the topics meaningful and 48% to some extent meaningful.
Do you feel motivated and committed to learning the content and foreign language in this course?	52% of the students were completely motivated and committed, and 48% were to some extent.
Do you think that the course allowed you to improve your vocabulary in a fun and enjoyable way?	52% of students complete agreed that the course allowed them to improve their vocabulary in a fun and enjoyable way and 48% to some extent.
In your opinion, did access to multimedia resources, such as videos and interactive exercises, contribute positively to your understanding and retention of the concepts taught?	100% of the students totally agreed or agreed.
Which of the following resources do you consider were most significant in your learning?	29% of the students considered all the content of the course was significant, 24% considered that interactive games and activities were significant, 29% and listening exercises were significant and 19% considered videos and presentations were significant.

Note. This table shows the result of the questions related to the CLIL methodology applied.

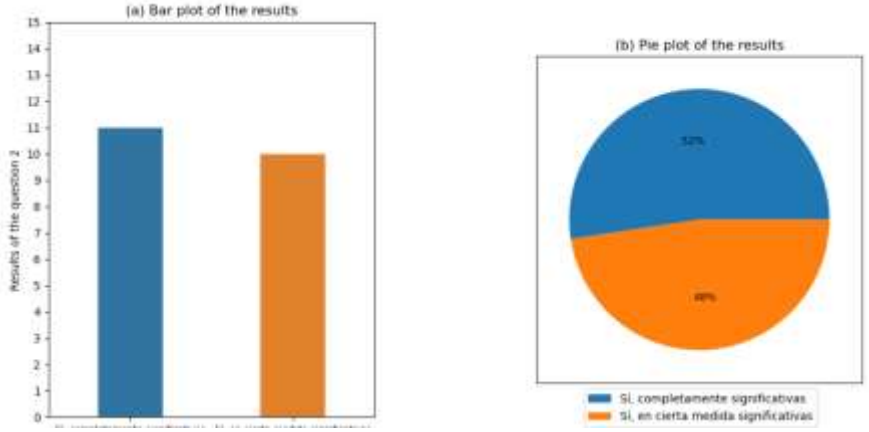
According to the survey results, it can be stated that teachers consider the topics covered in the course to be significant for the professional development of their careers as P.E. educators. This suggests that the CLIL approach used in the course design has been effective in integrating curriculum content and foreign language teaching in a meaningful and relevant way to their field of study.

Furthermore, the fact that most of teachers felt completely motivated and committed to learning the content and foreign language suggests that the CLIL approach used in course design has also been effective in fostering teacher motivation and commitment to their continuing education. The fact that there were not answers which tent to negative show that the course allowed them to improve their vocabulary in a fun and enjoyable way suggests that the CLIL approach used in course design has also been effective in making foreign language learning more attractive and accessible for P.E. teachers.

Finally, the survey results suggest that the CLIL approach used in course design has been effective in fostering teacher motivation and commitment, as well as improving their vocabulary in a significant and relevant way to their career in P.E. This demonstrates the importance of using innovative and effective approaches in teachers continuing education to improve their educational practice and their students' learning. Below you can see the results of the satisfaction survey in the questions focused on the CLIL category:

Figure 7

Survey Question 6



Note. Do you consider that the topics covered in the course are meaningful for the professional development of your career?

Table 9

Survey Question 6

Answers	Amount of answers	Percentage
Yes, completely significant	11	52%
Yes, somewhat significant	10	48%
No, not significant	0	0%

Note. Results of questions related to professional development.

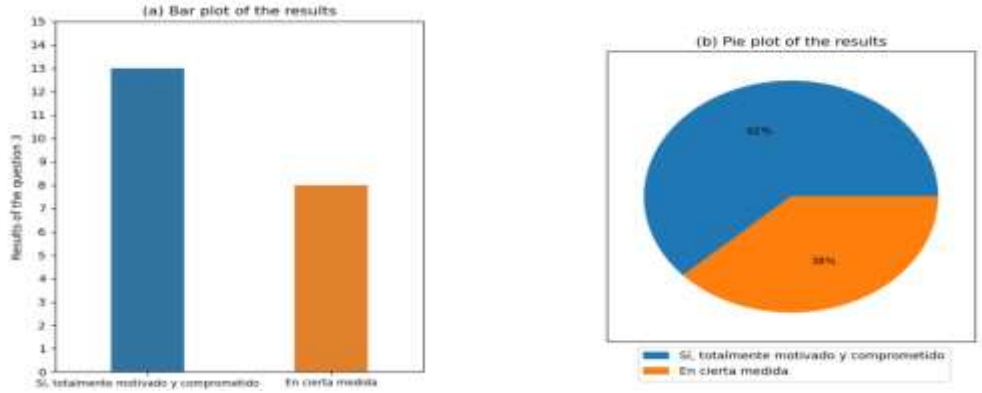
Table 9 and Figure 7 Analysis. The data analysis reveals that 52% of the participants responded "YES, COMPLETELY SIGNIFICANT" when asked if the topics covered in the course are meaningful for the professional development of their careers. This high rate of agreement suggests that a significant portion of the participants found the course topics to be highly relevant and beneficial for their professional development. Additionally, 48% of the participants indicated "YES, SOMEWHAT SIGNIFICANT." Although this figure is moderately lower than those who responded "completely significant," it still reflects an overall positive perception regarding the relevance of the course topics to their professional development. Importantly, none of the respondents selected the "NO, NOT SIGNIFICANT" option, indicating that none of the participants found the course topics to be lacking in importance for their professional development. These results suggest that the course has a positive impact on participants' perceptions of their professional development.

The results indicate that the vast majority of respondents perceive the topics covered in the course to be important for their career development. This perception may be due to the fact that the topics addressed are related to specific skills or knowledge necessary for work in the corresponding field. It is possible that the respondents saw a clear connection between the topics covered and their work practice, which led them to consider them significant.

found the course to be completely ineffective or unpleasant for vocabulary improvement.

Figure 8

Survey Question 7



Note. Do you feel motivated and committed to learning the content and foreign language in this course?

Table 10

Survey Question 7

Answers	Amount of answers	Percentage
Yes, fully motivated and committed	13	62%
To some extent	8	38%
No, not motivated and committed at all	0	0%

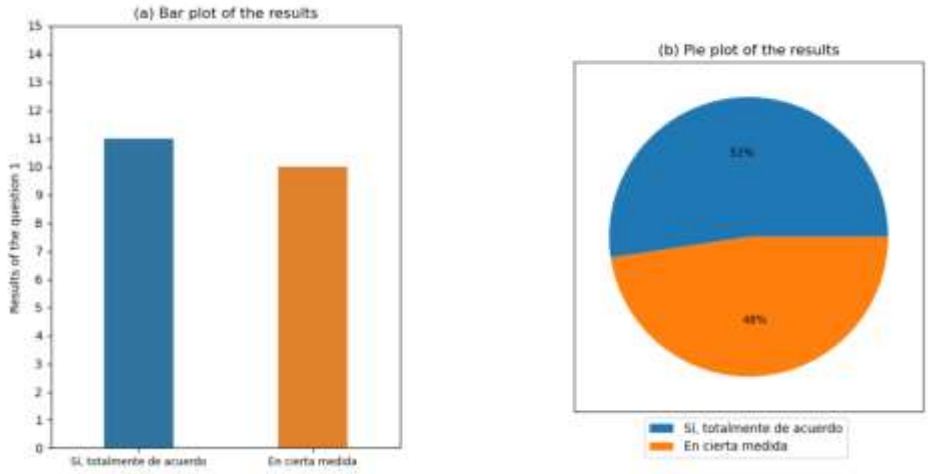
Note. In this table, it can observe the result of the motivation and commitment due to the course content.

Table 10 and Figure 8 Analysis. The data analysis reveals that 62% of the participants responded "YES, FULLY MOTIVATED AND COMMITTED" when asked if they feel motivated and committed to learning the content and foreign language in the course. This high rate of agreement suggests that a significant majority of the participants are highly motivated and committed to learning the course content and the foreign language. Additionally, 38% of the participants indicated "TO SOME EXTENT." Although this percentage is lower than those who responded "fully motivated and committed," it still reflects an overall positive perception regarding motivation and commitment to learning the course content and the foreign language. It is important to note that none of the respondents selected the option "NO, NOT MOTIVATED AND COMMITTED AT ALL," indicating that none of the participants expressed a complete lack of motivation and commitment to learning in the course.

These results indicate that the vast majority of the respondents were highly motivated and committed to the course, suggesting that they found the course valuable and interesting. The lack of responses in the "not motivated and committed at all" category also suggests that students did not find any aspect of the course particularly problematic or demotivating. However, it is important to note that some participants were only motivated and committed to some extent. This could be because they found some aspects of the course less interesting or relevant to their specific needs in the sports field.

Figure 9

Survey Question 8



Note. Do you think that the course allowed you to improve your vocabulary in a fun and enjoyable way?

Table 11

Survey Question 8

Answers	Amount of answers	Percentage
Completely agree	11	52%
To some extent	10	48%
Totally disagree	0	0%

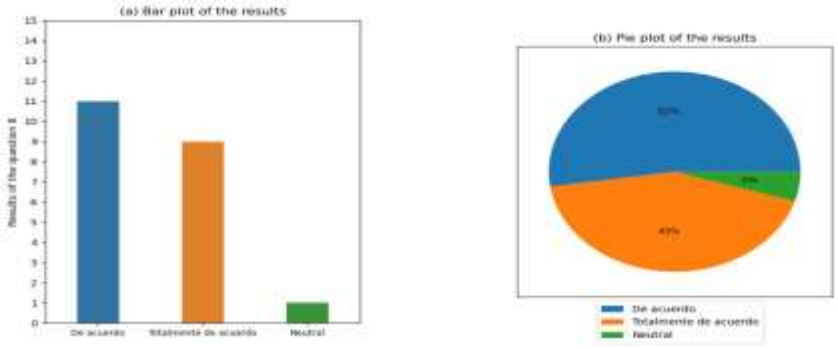
Note. Results of improving the technical vocabulary. Question 8: Do you think that the course allowed you to improve your vocabulary in a fun and enjoyable way?

Table 11 and Figure 9 Analysis. The data analysis reveals that 52% of the teachers completely agreed that the course allowed them to improve their vocabulary in a fun and enjoyable way, suggesting that a significant portion of the participating teachers experienced vocabulary improvement and found the course satisfactory in this regard. Furthermore, 48% of

the participants indicated that they agreed 'to some extent' that the course helped them improve their vocabulary in an enjoyable manner. Although this figure is slightly lower than those who completely agreed, it still reflects an overall positive perception. It is interesting to note that none of the respondents selected the 'Totally Disagree' option, suggesting that none of the participants

Figure 10

Survey Question 9



Note. In your opinion, did access to multimedia resources, such as videos and interactive exercises, contribute positively to your understanding and retention of the concepts taught?

Table 10

Survey Question 9

Answers	Amount of answers	Percentage
Completely agree	11	52%
Agree	9	43%
Neutral	1	5%
Disagree	0	0%
Completely disagree	0	0%

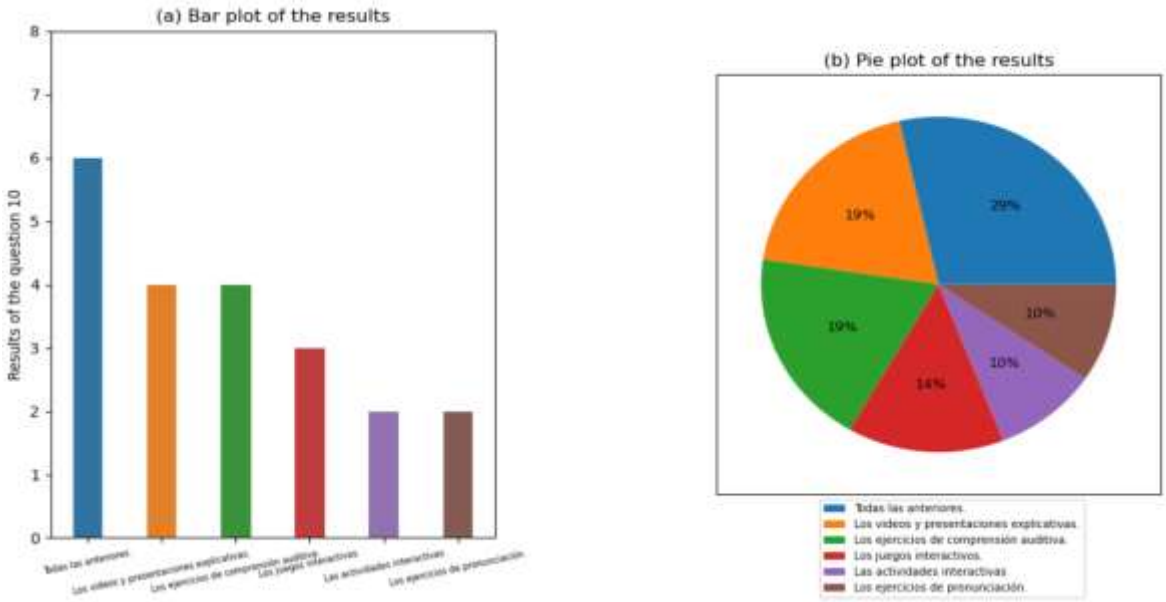
Note. This table shows the participants' opinions with respect to multimedia resources. Question 9: In your opinion, did access to multimedia resources, such as videos and interactive exercises, contribute positively to your understanding and retention of the concepts taught?

Table 12 and Figure 10 Analysis. It shows that 52% of the respondents answered "COMPLETELY AGREE" when asked if they consider that access to multimedia resources, such as videos and interactive exercises, positively contributed to their understanding and retention of the taught concepts. Additionally, 43% of the participants expressed their agreement with the statement by selecting "AGREE," while 5% opted for the "NEUTRAL" option in this assessment. There were no responses in the "DISAGREE" or "COMPLETELY DISAGREE" categories. In summary, a high percentage of the participants, a total of 95% (52% completely agree and 43% agree), perceive that access to multimedia resources had a positive impact on their understanding and retention of the taught concepts. Only 5% of the participants fall into the neutral category. There were no responses indicating disagreement. These results reflect a very positive perception of the effectiveness of multimedia resources in the learning process.

The results suggest that participants have a very positive perception of multimedia resources in the learning process. The lack of negative responses indicates that significant disadvantages are not perceived in the use of these resources. Instead, the majority of participants believe that multimedia resources have a positive impact on their understanding and retention of concepts. This suggests that participants value the inclusion of multimedia in their learning process and believe it enhances their educational experience. the results may support the idea that the effective integration of multimedia resources can be a valuable strategy to enhance the quality and effectiveness of teaching and learning.

Figure 11

Survey Question 10



Note. Which of the following resources do you consider were most significant in your learning?

Table 11

Survey Question 10

Answers	Amount of Answers	Percentage
Videos and explanatory presentations.	4	19%
Listening comprehension exercises.	4	19%
Interactive games.	3	14%
Interactive activities.	2	10%
None of the above.	0	0%
All of the above.	6	29%

Note. In this table, it can observe the significance of the resources. Which of the following resources do you consider were most significant in your learning?

Table 13 and Figure 11 Analysis. This question reveals several interesting trends regarding the resources considered most significant for learning by the participants. 19% of the respondents considered videos and explanatory presentations to be the most significant resources, suggesting that these visual aids played a crucial role in understanding concepts. Similarly, another 19% mentioned that listening comprehension exercises were significant, indicating that practicing listening and comprehending spoken material was beneficial for their learning. 14% found interactive games to be significant, suggesting that gamification and active participation through games were effective in the learning process. 10% emphasized the importance of interactive activities, reinforcing the idea that active and practical engagement is fundamental in learning. Additionally, Surprisingly, a significant percentage, 29%, selected "All of the above," which could suggest that for a substantial group of participants, a combination of various resource types was crucial for their learning. It's worth noting that none of the participants selected the option "None of the above," indicating that all participants found at least one resource significant in their learning process.

The analysis of participants' preferences regarding significant resources for learning reveals several interesting trends. These trends suggest that a diverse set of resources is valued in the learning process. Video presentations and explanatory materials appear to be highly effective in conveying information and aiding in understanding. Listening comprehension exercises are also valued, emphasizing the importance of developing listening skills. Interactive games and activities, along with pronunciation exercises, contribute to engaging and effective learning experiences. Furthermore, the fact that a significant number of participants selected "All of the above" indicates that a multifaceted approach, combining various resources, is preferred by a substantial portion of students. It is noteworthy that no participants chose "None of the above,"

underscoring, as mentioned earlier, that all participants identified at least one resource as significant, indicating the diverse nature of effective learning.

Vocabulary Learning. Ultimately, a crucial category is addressed in the research: the effectiveness of the VLE in improving the English vocabulary of P.E. teachers in relation to the field of sports. To analyze this category, entry and exit exams were implemented, and the study "Developing and exploring the behavior of two new versions of the vocabulary levels test" by Schmitt, N., Schmitt, D., & Clapham, C. (2001) was used as a useful tool. The analysis was done using tabulation tables (see Appendix H). A question-by-question comparison was made for both exams to calculate the differences in the results for each teacher. In addition, a general average of the two exams was calculated to assess overall improvement. The results clearly show individual differences and average progress, providing a detailed view of the impact of VLE on vocabulary learning. This study showed a comparative analysis methodology, which evaluates the relationship between two variables: a student's vocabulary level at the beginning of a course (entry test) and their level at the end of the course (exit test), determining if there has been a significant improvement. Likewise, specific areas of vocabulary that require greater attention to improve the student's competence in the foreign language can be identified.

To correctly evaluate vocabulary learning, an entrance test was carried out with the purpose of identifying the prior knowledge that IDERF teachers had before the implementation of VLE. The entrance test evaluated the indicators of spelling, comprehension, and coherence/cohesion. According to Schmitt (2019), it is crucial that vocabulary assessments measure both word recognition and their use in real-world contexts. This can be accomplished through tests that include fill-in-the-blank tasks and other interactive methods.

Subsequently, the development of the VLE was carried out, in which different types of interactive activities designed to improve vocabulary learning were implemented. These activities include multiple-choice exercises, word games, and text analysis. In addition, various tools from the H5P Moodle plugin were used to create interactive content, such as interactive quizzes, drag-and-drop activities, videos, and interactive presentations (see Appendix B). The main objective was to provide a dynamic and engaging learning environment that promoted the effective use of vocabulary in diverse and authentic contexts in the P.E.

At the end of the VLE implementation period, a final test (exit test) was carried out to evaluate the teachers' progress in terms of the previously mentioned indicators. The results showed a significant improvement in vocabulary recognition and use, as well as coherence and cohesion. This comprehensive, practice-based approach proved to be effective for the development of vocabulary and communicative competence in the English language.

Therefore, this tool was applied to analyze the results of the entry and exit exams in the context of the research on the effectiveness of the VLE in improving English vocabulary related to the field of sports for P.E. teachers.

Table 12

Result of exams.

Skill	Mean Difference of the Overall Results
Coherence and cohesion	0,6985715032
Spelling	0,3614285858
Comprenhension	0,5814285945

Note. This table shows the results for each indicator.

The results obtained in the research on the effectiveness of a VLE in improving the English vocabulary of P.E. teachers, in relation to the area of sports, are addressed. As mentioned

earlier, the study "Developing and exploring the behavior of two new versions of the vocabulary levels test" by Schmitt, N., Schmitt, D., & Clapham, C. (2001) was used as a tool to evaluate the relationship between the teachers' vocabulary level at the beginning of the course (entry test) and their level at the end of the course (exit test), determining if there has been a significant improvement. In addition, specific areas of vocabulary that require more attention to improve foreign language competence were identified.

Furthermore, it is important to note that the entry test and exit test used in evaluating the effectiveness of the VLE in improving the English vocabulary of P.E. teachers were evaluated with a maximum score of 5 points. This allows for a more precise and objective measurement of the English vocabulary level of each teacher, both at the beginning and at the end of the course. With this evaluation system, the improvement in the teachers' vocabulary level after using the VLE can be compared and determined with greater certainty.

The results obtained indicate that the VLE has positive effects in improving the English vocabulary of P.E. teachers in relation to the area of sports. The percentage of improvement ranges from 36.14% to 164.42%. This suggests that the use of VLE is a useful tool for improving the English vocabulary of P.E. teachers and can be applied in the educational field to improve foreign language competence in other specific areas.

Both the entry test and exit test showed evolution in technical vocabulary in different areas such as, comprehension, spelling, and coherence and cohesion, which can indicate more precisely the progress of teachers in learning vocabulary, generating a key aspect to be able to express themselves clearly and accurately.

Regarding the comprehension indicator, the average difference in results between the entry test and exit test is approximately 0.5814 points, which translates to a 58.14%

improvement in percentage terms. This suggests that there was also a substantial improvement in participants' comprehension after completing the course.

In terms of the spelling indicator, the average difference in results between the entry test and exit test for spelling is approximately 0.3614. This indicates that there was a moderate improvement in participants' spelling after completing the course. This result, when expressed as a percentage, shows a 36.14% improvement. Finally, in the coherence and cohesion indicator, the greatest improvement was observed. The average difference in results between the entry test and exit test for this category is approximately 0.6986, which is equivalent to a 69.86% improvement. This suggests that participants were able to improve their ability to use words and phrases more effectively to communicate ideas clearly and coherently.

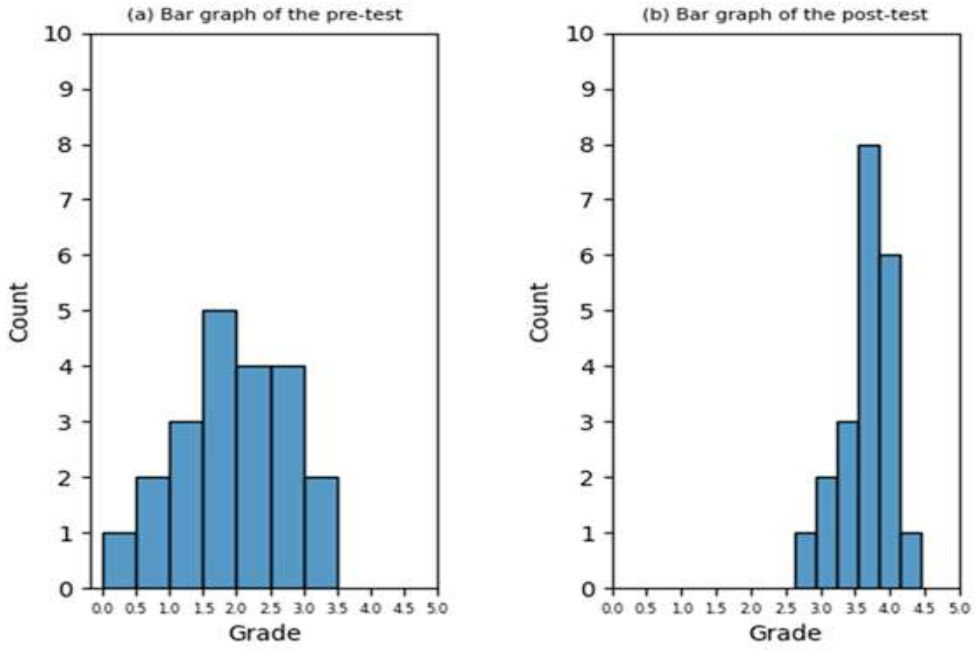
It is important to note that these results should be interpreted with caution, as they represent a limited sample and the factors that can influence the improvement of English vocabulary are multiple and complex. Future research is recommended to delve into the topic and consider a broader and more diverse sample, as well as the incorporation of other tools and methodologies that allow for a more comprehensive and accurate evaluation of the effectiveness of the VLE in improving English vocabulary.

Entry test and Exit test Analysis. In Figure 12 two histograms are observed: (a) and (b), which correspond to the histograms of the final results obtained in the entry test and the exit test, respectively. It is observed that in histogram (a), the distribution of the results is more shifted to the left than in histogram (b), indicating that there was better performance at the group level in the exit test than in the entry test. In line with the previous observation, it can be seen that the most common scores in the entry test were in the range of (1.5) and (2.0), while in the exit test the most common scores were in the range of (3.5) and (4.0), in addition, the distribution in

graph (b) is presented in a narrower range of scores and concentrated in the center of said distribution, which means that there was less dispersion in the exit test results than in the entry test.

Figure 12

Histogram entry and exit test.



Note. This figure shows the bar graphs of entry and exit test.

A normality test (Shapiro-Wilk) was conducted to determine if the results obtained in the entry test and exit test follow a normal distribution. A significance level of 5% was used. The hypotheses were as follows:

H0: The variable "Grade" follows a normal distribution.

H1: The variable "Grade" does not follow a normal distribution.

The results obtained from the Shapiro-Wilk test were:

Table 13

Shapiro-Wilk

	P-value
Entry test	0,67181
Exit test	0,5663

Note. Shapiro-Wilk test result.

Because the "p-value" is greater than 0.05 in the Shapiro-Wilk test applied to the entry test and exit test, it is not possible to reject the null hypothesis "H0", so the Wilcoxon test is applied. on the tests in order to determine if the difference between the average of the results obtained in the entry test and the exit test is significant, again assuming a level of significance equal to 5%:

Hypothesis.

H0: The difference in the mean between the "Grade" variable of the entry test and the exit test is not significant

H1: The difference in the mean between the "Grade" variable of the entry test and the exit test is significant

The results obtained by the test were:

Table 14

Wilcoxon test.

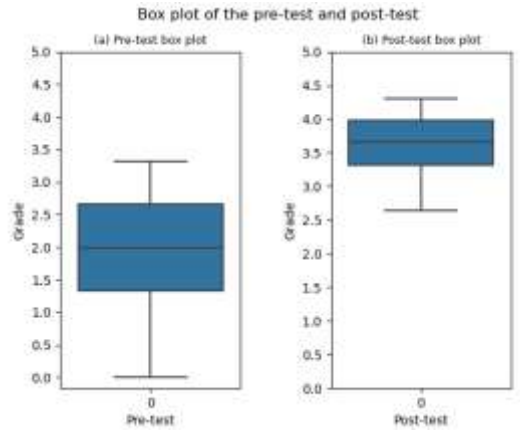
	Wilcoxon test
W	0
P-value	9,54E-07

Note. Wilcoxon test Result.

On the one hand, the value (W=0) indicates that the exit test results were systematically higher than the final entry test results; in addition, the "p-value" obtained is less than 0.05, which allows us to reject the hypothesis. null (H0) and accept (H1), that is, the difference in the mean between the "Grade" variable of the entry test and exit test is significant, this can be seen in the following figure:

Figure 13

Box plot of entry and -exit test.



Note. Box plot of the results.

In Figure 13 two box plots are observed: (a) and (b), which correspond to the box plots of the final results obtained in the entry test and the exit test, respectively. The black line that passes through half of the boxes represent the median. Graph (a) indicates that approximately between 25% and 75% of the entry test scores were between grades (1.5) and (2.5), while graph (b) shows that approximately between 25% and 75% of the exit test scores were between the grades (3.5) and (4.0), in addition, that box (b) is narrower than box (a), this can be explained

by the fact that the general performance of the sample in the exit test was closer to each other than in the entry test, implying a homogenization effect in the scores.

To compare the average increase in the results of these questions in the exit test with respect to the entry test, the Wilcoxon test is applied with a significance level of (5%), to determine in which variables (refer to the questions) the average difference in the results was significant.

Hypothesis.

H0: The difference in the mean of the variables ("Question 1", "Question 2", "Question 3", "Question 4", "Question 5", "Question 6", "Question 7", "Question 8" , "Question 9", "Question 10", "Question 11", "Question 12", "Question 13", "Question 14", "Question 15"),between the entry test and the exit test is not significant.

H1: The difference in the mean of the variables ("Question 1", "Question 2", "Question 3", "Question 4", "Question 5", "Question 6", "Question 7", "Question 8" , "Question 9", "Question 10", "Question 11", "Question 12", "Question 13", "Question 14", "Question 15"), between the entry test and the exit test is significant.

Overall Entry test and Exit test Analysis in Vocabulary indicators. The Wilcoxon test was applied to the general competencies to determine if the average difference between their results in the entry test and exit test is significant:

Hypothesis.

H0: The difference between the percentage of the variables ("Cohesion and coherence", "Spelling", "Comprehension",), in the entry test and the exit test, were not significant.

H1: The difference in the percentage of the variables (“Cohesion and coherence”, “Spelling”, “Comprehension”,), in the entry test and the exit test, were significant.

Table 15

Wilcoxon entry and exit test indicators.

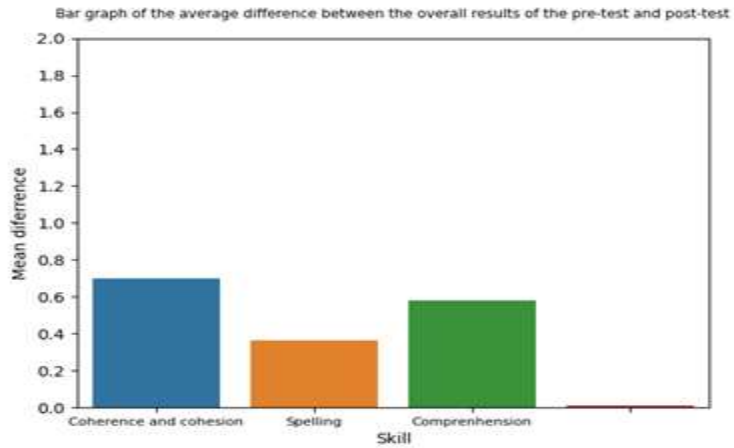
Variable	Cohesion and Coherence	Spelling	Comprehension
P-value	0,002790313	0,002405011	0,00025687

Note. Wilcoxon entry and exit test indicators results.

Since none of the “p-values” is greater than (0.05), the null hypothesis (H0) is rejected and, therefore, it is accepted that the difference between the mean of the results of each entry test and exit test competition test is significant. The following diagram allows you to visualize the average increase that occurred in each indicator:

Figure 14

Bar graph of overall results.



Note. Graphic of overall results.

Figure 18 shows the average increase that occurred in each competence. It is observed that the growth occurred in “Coherence and cohesion”, “Spelling” and “Comprehension”. increased on average (0.7), (0.36) and (0.58) units, respectively.

the results of exams taken by teachers before and after their participation in a 4-6 week training program in a VLE with CLIL methodology. It can be seen that all teachers improved their scores in the exit test compared to the entry test, indicating that the program had a positive impact on their learning.

It is interesting to note that the program lasted only a maximum of 6 weeks, suggesting that a well-designed and structured online course can have a significant impact on the development of language skills in a limited time. This may be particularly relevant for teachers who have time constraints due to their work and personal responsibilities. Overall, the results indicate that the online training program with CLIL methodology can be an effective tool for enhancing the language proficiency of P.E. teachers.

As can be seen, in all areas of evaluated skills, there was an improvement in scores after completing the VLE English course, Overall, the results indicate that the VLE English course was effective in improving vocabulary skills in these areas, with a significant increase in all evaluated areas. These results suggest that the CLIL methodology used in the course, as well as the inclusion of technology in the teaching and learning process, positively contributed to the development of the participants' vocabulary.

Reliability and validity of analysis and findings

Objectivity of Results

To analyze the results of the survey, the descriptive method was used, as it is a survey with closed questions. According to authors such as Hernández-Sampieri, Fernández-Collado,

and Baptista-Lucio (2014), descriptive analysis is useful for summarizing and describing the characteristics of a set of data, in this case, the responses to the survey. In addition, it allows identifying patterns and trends in the responses and provides relevant information for decision-making. Likewise, authors such as Hair et al. (2019) emphasize that descriptive analysis is an important step in social research, as it allows summarizing and organizing data in a clear and understandable way for the reader. In this sense, descriptive analysis proved to be a useful tool to analyze the results of the survey in the present study.

To analyze the results of the entry test and exit test, a comparative analysis method was used. According to recent authors such as Kumar and Kumar (2021), comparative analysis is a powerful tool that allows the identification of differences and similarities between two or more variables or groups. This method enables the researcher to assess the effectiveness of an intervention, such as an educational program or training, by comparing the results before and after its implementation. Similarly, authors like Petri and Govern (2022) highlight the importance of comparative analysis in educational research, as it allows for a more nuanced understanding of the impact of different teaching strategies and methods. In this study, the comparative analysis method was essential to evaluate the progress and effectiveness of the educational program based on the entry test and exit test results.

The data analysis was performed in the Excel program, using tools such as pivot tables and charts. According to authors such as Kothari (2013) and Stiglic et al. (2017), Excel is a useful tool for data analysis, especially for descriptive and comparative analysis. Pivot tables allowed summarizing and grouping data based on different variables, which facilitated the identification of patterns and trends in the results. Similarly, charts allowed visualizing data in a

clear and understandable way, which facilitated the interpretation and communication of the results.

Credibility and Reliability of Findings

The credibility and reliability of the findings in this study were ensured through several methods. Firstly, descriptive analysis was used to summarize and describe the characteristics of the data collected in the survey. This method is useful for identifying patterns and trends in the responses and providing relevant information for decision-making. Secondly, comparative analysis was used to evaluate the effectiveness of an educational program based on the results of the entry- and exit test. This method allowed for the identification of differences and similarities between the results before and after the implementation of the program.

In addition, Excel was used for data analysis, which allowed for the summarization and grouping of data according to different variables using pivot tables and graphs, as well as the visualization of results in a clear and understandable way.

Discussions and Conclusions

This chapter presents the discussion and conclusions of a study on the effectiveness of a VLE based on the CLIL methodology to improve the English vocabulary of P.E. teachers. The results show significant improvements in the participants' language skills, highlighting the effectiveness of the CLIL approach. The relevance and significance of the results, as well as the contributions of the study, are analyzed. Pedagogical and research implications for the field of study are discussed, along with research limitations and recommendations for further research. The chapter concludes by emphasizing the positive impact of the VLE and the CLIL methodology on the learning of English for P.E. teachers.

Discussion

According to Coyle, Hood, and Marsh's (2010) research, the CLIL (Content and Language Integrated Learning) methodology is an effective teaching approach for improving students' language competence in a second language. Additionally, Dalton-Puffer (2007) asserts that the CLIL methodology is particularly effective for teaching foreign languages in specific contexts, such as P.E. and sports. Based on the analyzed data, it can be stated that there is an interest and a need for P.E. teachers to learn English language skills, which suggests an opportunity for the development of an online course that focuses on teaching vocabulary in English in the context of P.E. and sports.

Furthermore, according to Allen and Seaman's studies (2017), online education is experiencing steady growth and increasing acceptance among students and education professionals, indicating that an online course for P.E. teachers could be an effective solution to reach a wider audience. The data indicates that online education is a feasible option for teachers

dealing with geographic and transportation obstacles. This suggests that an online course could effectively cater to a larger audience.

Finally, this study contributes to the improvement of English language teaching in the context of P.E. and sports through the implementation of a CLIL-based VLE. The results show that after completing the 4-6-week program, P.E. teachers significantly improved their English language skills, suggesting that the course is effective in achieving its objective. The study also highlights the importance of motivation, as Richard Deci (2002) posits in his self-determination theory, which states that human motivation is a continuum ranging from intrinsic motivation (arising from the satisfaction of the activity itself) to extrinsic motivation (arising from external factors such as rewards). The study demonstrates that people are more likely to engage in and feel committed to an activity if they feel they have some degree of control and autonomy over it, and if they feel the activity has some value and meaning to them. As observed, the results also indicate that participants found the course motivating and that the topics covered are relevant to their professional development. This demonstrates that a program of this kind can be useful and relevant for P.E. teachers seeking to improve their English language skills.

Interpretation Of the Findings

The VLE design had a significant correlation with the enjoyment and effectiveness of learning. This means that the way of the VLE was designed had an impact on how much the teachers enjoyed and learned from it. This is a positive finding that suggests that the resource was well-designed and engaging, the study highlights the importance of the course design and its impact on the enjoyment and effectiveness of learning.

The topics covered in the VLE were perceived as important for professional development by the majority of respondents. This is another positive finding that suggests that the VLE was relevant and useful for the teachers' professional growth.

The majority of respondents were highly motivated and committed to the VLE. This is a positive indication that the teachers found the VLE valuable and interesting, which may have contributed to their engagement and success in the course.

The majority of respondents perceived online learning to have greater flexibility in terms of study schedules and locations. This finding suggests that the teachers appreciated the convenience of online learning and valued the flexibility it provided.

Respondents had a positive perception of online learning as a viable alternative for people with busy work schedules, limited time for education, and living in remote geographic areas. This is a positive finding that suggests that the teachers saw online learning as a valuable and accessible option for professional development.

There was a positive and optimistic view of the effectiveness of online learning as a viable alternative to traditional classroom instruction. This is another positive finding that suggests that the teachers were open to the idea of online learning and believed that it could be just as effective as traditional classroom instruction.

There was an increase in the average scores of the teachers after their participation in a 6-week training program in a VLE. This is a positive finding that suggests that the training was effective in improving the teachers' knowledge and vocabulary skills. This may have a positive impact on their teaching practices and student learning outcomes.

Research implications

Expand knowledge about the effectiveness of integrating VLEs and CLIL in language teaching. This study shows that this methodology can be effective in improving teachers' linguistic competence in specific areas, but broader studies could be conducted to generalize these results to other contexts and educational levels.

Identify best practices for integrating VLEs and CLIL in language teaching. This study does not specifically address this aspect, but it could be interesting to conduct studies that identify the characteristics of courses that work best to improve teachers' linguistic competence.

Explore the impact of improving teachers' linguistic competence on student learning. This study focuses on improving teachers' linguistic competence, but it could be interesting to explore whether this improvement has any impact on student learning, and in which specific aspects.

Evaluate the effectiveness of other methodologies to improve teachers' linguistic competence. This study focuses on the integration of VLEs and CLIL, but it could be interesting to conduct comparative studies that evaluate the effectiveness of other methodologies, such as language immersion courses or traditional language teaching courses.

Research implications for the field of study

This study contributes to designing and evaluating a VLE for improving the English vocabulary of P.E. teachers in the workplace context. Firstly, the research demonstrates that the CLIL methodology is an effective strategy for improving linguistic competence in a second language, specifically in the context of P.E. and sports. This is important because this methodology has been little explored in this field, and this research provides new perspectives.

The findings of this study align with recent research on the effectiveness of CLIL methodology in teaching English. For example, a study by Marsh (2018) found that CLIL

methodology is effective in improving linguistic competence in a second language, and is particularly effective in specific contexts, such as P.E. and sports. Additionally, a study by Coyle et al. (2018) demonstrated that CLIL methodology can improve linguistic competence and content learning and can be an effective approach to teaching English in non-linguistic contexts.

Secondly, the study highlights the feasibility of a VLE for teaching vocabulary in English in this context. Online education is becoming an increasingly accepted and effective option for language teaching, especially for those facing geographical and transportation barriers (Hockly & Clandfield, 2019). Furthermore, online education can increase flexibility and access to learning resources for students (Cavanaugh, Barbour, & Clark, 2009).

Finally, this study contributes to the improvement of English language teaching in the context of P.E. and sports through the implementation of VLE based on the CLIL methodology. The results indicate that after completing the program, P.E. teachers significantly improved their Vocabulary. Additionally, the study highlights the importance of motivation and how a student-centered approach can increase motivation and commitment to learning.

Regarding the importance of motivation, Ryan and Deci's (2017) self-determination theory emphasizes the importance of meeting students' basic psychological needs (autonomy, competence, and relatedness) to increase their intrinsic motivation and commitment to learning. Additionally, Dörnyei's (2014) achievement motivation theory points out that motivation and commitment can be increased by creating clear and relevant goals for students and designing activities that are challenging and meaningful to them.

Research Limitations on the Present Study

Assessment of Specific Skills in Vocabulary

In the context of P.E. and sports, technical vocabulary is a fundamental aspect that students must learn in order to properly understand and apply the concepts and techniques

involved in this area. Therefore, the assessment of specific language skills in this vocabulary is essential to measure the level of mastery that students have in the area.

The study focused on the evaluation of specific language skills, such as, comprehension, spelling, and coherence and cohesion in the technical vocabulary of P.E. and sports. Additional studies may be needed to evaluate other important language skills, such as fluency or vocabulary variety. According to Nation (2001), fluency in vocabulary production refers to a speaker's ability to use words quickly and effortlessly in conversation. In a study on the evaluation of language skills in learning English as a second language, Nesselhauf and Tschirner (2002) suggest that lexical variety in writing can be evaluated through the use of high-frequency word lists and thematic vocabulary.

Regarding fluency, the VLE was executed asynchronously, so the fluency skill was affected as it would require synchronous conversation to evaluate the process. Regarding variety, the execution time of the research was 6 weeks, which prevented further expansion of vocabulary in the use of synonyms, antonyms, hypernyms, hyponyms, and idioms, in the field or area of knowledge. These are fundamental aspects highlighted by Halliday (1978), Nation (2001), Waring and Takaki (2003), among others, who emphasize that lexical variety is an important aspect for understanding and producing texts, as it allows the speaker or writer to express a wider range of meanings and nuances in their discourse.

Absence of Control Group

The study did not include a control group, which limits the ability to attribute the observed changes exclusively to the VLE designed in CLIL. The study was unique to the municipality of Fusagasugá and the P.E. teachers of IDERF, who taught their classes in their native language, making it impossible to use a control group. The lack of a control group is a

common limitation in intervention studies, as without it, it is difficult to attribute the observed changes exclusively to the intervention. However, a process control was executed using pre and exit test results, but including a control group would have been useful to evaluate the effects of the VLE with greater precision.

Sample Size

The study was conducted with a limited number of teachers. Therefore, it is possible that the results may not be generalizable to a larger population. Despite the positive results obtained in this study, it is important to note that the sample of participants was limited and came from a sample of 10 P.E. teachers from IDERF, since the rest of the population did not get involved due to other previously acquired obligations, even though the VLE allowed them to work under the schedule that was most convenient for them. Therefore, caution should be exercised when generalizing the results to a larger population.

Duration of the Course

The VLE course designed in CLIL in this study had a relatively short duration. It is possible that the results would have been different if the course had lasted longer and more thematic units had been included. However, it is important to consider that many of the participating teachers have work and personal obligations that make it difficult to implement a longer course. Despite the limited duration of the course, significant improvements were observed in the specific skills of the evaluated technical English vocabulary.

Recommendations for Further Research

Below are some recommendations for future studies related to CLIL and VLE methodology, some of which arise from the limitations encountered in the study, and others that would seek to achieve a greater impact:

It would be interesting to conduct the same study in a different context, such as a primary or secondary school, or with language teachers who teach languages other than English. This could help determine if the results are generalizable to other contexts, which would provide a more complete understanding of the effectiveness of the CLIL approach in learning technical vocabulary in different educational contexts.

According to Coyle (2005), the CLIL approach can be applied in different contexts and educational levels, and the successful implementation of the approach depends on various factors, such as teacher training and curriculum adaptation. However, Lasagabaster and Sierra (2010) indicate that the implementation of the CLIL approach can vary depending on the educational context and the profile of the students, so it is necessary to conduct research in different contexts to determine the effectiveness and adaptation of CLIL, suggesting that it is possible to apply it in a wide variety of educational settings and levels.

Explore the impact of different types of teacher training courses on learning technical vocabulary in P.E. Although a CLIL-designed VLE was used in this study, there are other types of virtual learning environments that could be equally or even more effective in developing specific vocabulary skills. For example, virtual simulation environments (VSEs) and virtual and augmented reality environments (VARs) offer more immersive experiences that could improve the learning of technical vocabulary through interaction with virtual objects and situations.

In addition, personalized learning environments (PLEs) allow the content and learning activities to be adapted to the individual needs and preferences of each student, which could increase motivation and learning effectiveness. Therefore, exploring the impact of these different types of virtual learning environments on learning technical vocabulary in P.E. could provide a

more complete understanding of the options available to teachers and students, and which would be the most effective.

To improve the validity of the results of this study, it is suggested to conduct a long-term follow-up of the participating teachers to evaluate the long-term impact of the training course on teaching technical vocabulary in P.E. Although the results of the current study showed a significant improvement in technical vocabulary knowledge immediately after the training course, it is necessary to consider the possible decrease of the effect over time and to evaluate if the training course provides a lasting benefit in teaching technical vocabulary in the future.

This research would allow for a more complete understanding of the impact of the training course on the teaching practice of teachers and would help inform future training and professional development decisions. It is important to note that previous research, such as that of Collet and Hine (2017), has shown the importance of conducting long-term evaluations in teacher training to better understand the impact of training courses on teaching and teacher performance in the long term.

To improve the validity and generalizability of the results obtained in this study, it would be important to consider the use of a larger sample of teachers in future research. Although the current results suggest that the CLIL-designed teacher training course was effective in improving technical vocabulary knowledge in P.E., a larger sample would allow for the evaluation of the generalization of the results and determine if they apply to a wider population of teachers, as it reduces the risk of random errors and improves the accuracy of the results.

According to Neumann and Hood (2009), sample size is one of the key factors influencing the accuracy of results, so a larger sample can reduce the risk of random errors and improve the reliability of findings. In addition, a larger sample could allow for the evaluation of

subgroups of teachers according to their experience and level of previous knowledge, which could provide valuable information for designing

Conclusions of the Study

The results of this study suggest that the incorporation of VLEs (Virtual Learning Environments) and CLIL (Content and Language Integrated Learning) in language teaching showed a positive impact on the English language learning of the teachers at IDERF. The findings indicate that the CLIL-designed VLE course was effective in improving the comprehension, spelling, coherence, and cohesion of the teachers in English. The results of the pre- and post-course evaluation demonstrated a significant improvement in the percentage of correct responses and average scores in each of the vocabulary skills.

The design of an English VLE course based on CLIL methodology showed an effective strategy to enrich the communicative vocabulary of the P.E. teachers at IDERF. By analyzing the needs and learning styles of the teachers, the course can be tailored to their requirements and learning preferences. In addition, the use of interactive activities relevant to the context of P.E. and sports can maintain the interest and motivation of the course participants.

A thorough review of literature related to P.E. and sports is a useful tool to identify key topics, concepts, and relevant terminology for second language learning by P.E. teachers. Additionally, conducting surveys or interviews with P.E. teachers allows exploration of their interests and motivations for learning a second language, which is useful for designing appropriate and tailored training programs to their needs and preferences. Overall, research in this area helps improve the quality of P.E. and sports by promoting second language learning among P.E. teachers.

Furthermore, the results suggest that the teaching methodology used in the VLE course

was effective as the teachers improved in all evaluated areas. The positive feedback from the teachers and their satisfaction with the course also support the effectiveness of the VLE approach in language teaching.

Virtual education has become a valuable tool for learning and teaching today, and VLEs are one of the most popular forms of virtual education. The implementation of an English VLE course based on CLIL methodology was an effective strategy to improve the communicative vocabulary of P.E. teachers at IDERF. Evaluating the VLE course through pre- and post-course assessments, as well as surveys and interviews, provided valuable information on its effectiveness and helps identify areas for improvement in future implementations. Overall, VLE can be a useful tool to improve the quality of education and learning in a variety of fields, including P.E. and sports.

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Appendices

Appendix A Resumen Analítico en Educación

Resumen Analítico en Educación (RAE)	
Información General	
Tipo de Documento	Proyecto de Investigación
Acceso al Documento	Proyecto de investigación para optar al título de Magister en Mediación Pedagógica del Aprendizaje del Inglés
Título del Documento	Evaluating the effectiveness of a CLIL-Based VLE course on English vocabulary development of physical education teachers at IDERF: A descriptive quantitative study
Autor	John Freddy Cortes Cortes
Publicación	2023
Palabras Clave	English, foreign language, virtual learning environment, Moodle, CLIL, sport.
Description	
This project aims to establish the theoretical foundations for implementing a Virtual Language Environment (VLE) for language learning in Moodle. It is specifically designed for Physical Education (P.E.) teachers to learn, expand, promote, and implement the English language in their expertise. A pilot study was conducted following the Content and Language Integrated Learning (CLIL) methodology to assess the effectiveness of the course in the VLE, measuring the progress of P.E. teachers in their acquisition of English vocabulary related to their field of	

study. To do so, an entry exam was administered at the beginning of the course and an exit exam at its conclusion, allowing for the measurement of participants' progress in their knowledge of the English language.

The comparison and analysis of results from both exams using statistical analysis demonstrated the effectiveness of the VLE in teaching the English language in the field of P.E. following the CLIL methodology. Moreover, the evaluation of each participant's individual progress throughout the course allowed for identifying strengths and weaknesses in the design of the VLE and proposed specific improvements to optimize its effectiveness.

The results obtained can help design more effective online language courses for P.E. teachers and other areas of specialization in the future.

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Content

The document compiles and provides the following structure: cover page, RAE (analytical summary of the document), abstract, table of contents, list of tables, list of appendices, introduction, statement of the problem, rationale, objectives, literature review (state of art, theoretical and conceptual framework), methodological design, analysis and interpretation of the information, results, conclusions and recommendations, references and appendices.

Methodology

The project methodology consists of seven stages, The Stage 1 was The selection of participating teachers from IDERF through an invitation sent to the institute's director, the stage 2 was the conducting the entry test, an initial diagnostic exam with 30 questions in English related to P.E., the stage 3 was the execution of the VLE (Virtual Learning Environment), The CLIL (Content and Language Integrated Learning) methodology will be used in virtual learning environments, with customized content to meet the needs of P.E. teachers, the stage 4 was implementation of the exit test, it consisted of 30 questions in English related to P.E. and was conducted on the Moodle platform to ensure standardized exam administration and consistent data collection, the stage 5 was conducting a satisfaction survey to gather teachers' perception of the VLE and its effectiveness in improving English vocabulary in the context of P.E.. The survey was address key aspects such as acceptability, feasibility, flexibility, motivation, and overall perception of effectiveness.

The stage 6 was the classification and tabulation of data obtained from the entry test, exit test, and satisfaction survey. The vocabulary diagnostic areas and survey results were analyzed to provide an overview of vocabulary levels and teachers' perceptions and finally, the stage 7 was analysis of findings through descriptive analysis of the collected quantitative data. Changes in vocabulary diagnostic areas were evaluated, and a comparative analysis of entry test and exit test results were conducted. The survey responses were also analyzed to identify patterns and trends in teachers' perception of the program.

Results

This project provides a summary of the results obtained from the implementation of the Virtual Learning Environment (VLE) in the context of P.E. and sports. The significance of these results, as well as their pedagogical and research implications, limitations, and recommendations for further studies, are discussed, the research question addressed in this project focused on evaluating the effectiveness of the VLE in improving English vocabulary among P.E. teachers at IDERF. The project was divided into several stages, including the selection of participating teachers, administration of a entry test and exit test, execution of the VLE, and collection of feedback through a satisfaction survey, the results showed a positive impact of the VLE on the participants' English vocabulary. Comparisons between the entry test and exit test scores revealed significant improvements in the areas of vocabulary diagnosis, including pronunciation, comprehension, spelling, and coherence/cohesion, these findings indicate that the VLE successfully enhanced the participants' language skills in the context of P.E., the satisfaction survey provided additional insights into the effectiveness of the VLE. Participants reported high levels of acceptability, feasibility, flexibility, motivation, and overall effectiveness of the program, this feedback indicates that the VLE was well-received

by the teachers and considered beneficial for their professional development, However, it is important to acknowledge certain limitations of the project.

Conclusions

The study demonstrated that the incorporation of Virtual Learning Environments (VLE) and Content and Language Integrated Learning (CLIL) in language teaching had a positive impact on the English language learning of the teachers at IDERF. The CLIL-designed VLE course was effective in improving the teachers' comprehension, spelling, coherence, and cohesion in English (see Appendix C). Additionally, the course was tailored to the teachers' needs and preferences, utilizing interactive activities relevant to P.E. and sports. The thorough literature review and positive feedback from the teachers support the effectiveness of this approach. In summary, VLEs based on CLIL are valuable tools for enhancing language education and learning in various fields, including P.E. and sports.

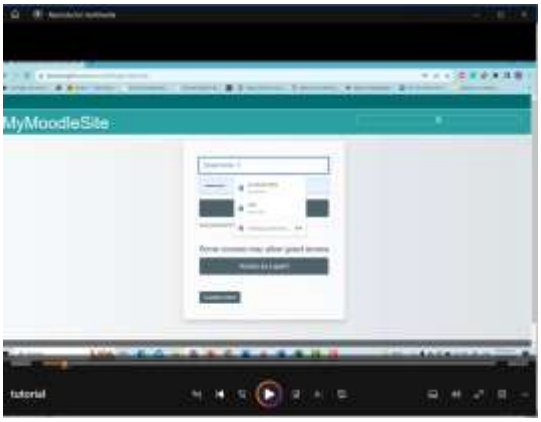
Appendix B Introductional Videos

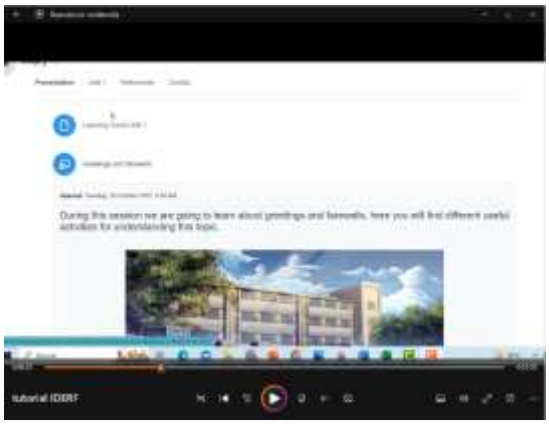
It can be seen in the tutorial videos that were used to facilitate the navigation of IDERF teachers in the VLE.

Video tutorial Access 1– Link:
https://drive.google.com/file/d/1jqykFQ7ldDoISVfsL5X5vY86WEy2p7Kl/view?usp=drive_link

Video tutorial Access 2 - Link :
https://drive.google.com/file/d/1v_OAWRQdBjVBiOnYH0eM_ja0fwDlynEG/view?usp=drive_link

Video tutorial VLE presentation- link:
https://drive.google.com/file/d/1xtxptxzk1hhBazUEP0rGegDAGBxUvKBN/view?usp=drive_link





Appendix C VLE content

Images of the VLE.

Below can be observed the screenshots of the VLE that was designed for IDERF teachers, which consists of 3 units, as well as links to the different resources created and used in the VLE.

Unit 1

Unit 2

UNAD_3: Human Body: Human
stmaryenglish.com.co/moodle/mod/lesson/vie
Level 1 - 1500 Adva...
B2 level Eng
BULLS
23

VIRTUAL ENVIRONMENTS

On
In
AT

VIRTUAL ENVIRONMENTS

Unit 3

Dumbbells
Kettlebells
Resistance bands
Jumping Box

VIRTUAL ENVIRONMENTS ...

VIRTUAL ENVIRONMENTS ...

More resources:

Basketball Vocabulary:

https://www.canva.com/design/DAFnOasaQPU/ncV8MUsN8YhSGHzslbMz9Q/watch?utm_content=DAFnOasaQPU&utm_campaign=designshare&utm_medium=link&utm_source=editor

Volleyball Vocabulary:

https://www.canva.com/design/DAFnmB6f23Q/LJ8MLsbdYmN3Xiges6zF0A/watch?utm_content=DAFnmB6f23Q&utm_campaign=designshare&utm_medium=link&utm_source=editor

Soccer Vocabulary:

https://www.canva.com/design/DAFnVyfs7I4/oX9h8ieRucuFJk5nlFGXNA/watch?utm_content=DAFnVyfs7I4&utm_campaign=designshare&utm_medium=link&utm_source=editor

Verb to be Explanation:

https://www.canva.com/design/DAFON7Jqt58/4-5Ym4hCoKxyT1jxy_-0DA/watch?utm_content=DAFON7Jqt58&utm_campaign=designshare&utm_medium=link&utm_source=editor

Imperatives:

https://www.canva.com/design/DAFPKoxUSVc/DhBi_EmGGJxUZYOSGKm_Eg/view?utm_content=DAFPKoxUSVc&utm_campaign=designshare&utm_medium=link&utm_source=editor

Class elements

https://www.canva.com/design/DAFPBzvWUzg/r7jGkJ1Lg-3RC0hMSqNYRQ/watch?utm_content=DAFPBzvWUzg&utm_campaign=designshare&utm_medium=link&utm_source=editor

Prepositions of place:

https://www.canva.com/design/DAFOqG43QpQ/P1_yR15q3RRWHDHRr6i_tg/view?utm_content=DAFOqG43QpQ&utm_campaign=designshare&utm_medium=link&utm_source=editor

Appendix D Informed consent

Consentimiento Informado

Yo _____ identificado con CC _____ declaro que he sido informado e invitado a participar en la investigación denominada "Evaluate a VLE course designed in CLIL to improve physical education teachers' English vocabulary at IDERF", éste es un proyecto de investigación educativa como opción de grado para la maestría de mediación pedagógica del aprendizaje del inglés de la universidad Nacional abierta y a distancia UNAD. Entiendo que este estudio busca evaluar un Entorno Virtual de Aprendizaje EVA, en su eficacia en el fortalecimiento de vocabulario básico en ingles enfocado en el área de la educación física, por lo tanto debo realizar el curso propuesto, el cual se ejecutará de manera virtual en la plataforma Moodle de manera asincrónica, entiendo que es un trabajo autónomo y que puedo tener acceso 24/7 teniendo total manejo de mi tiempo para desarrollar el curso, comprendo que le curso será habilitado durante 6 semanas que es el plazo máximo para realizar las unidades propuestas, soy consciente de que realizaré un examen de entrada y un examen al terminar el curso, con el cual se llevara una comparación de los resultados para conocer los avances obtenidos, también realizaré una encuesta al finalizar el curso, en la cual se expresaran las percepciones obtenidas en la realización del curso y que también será usadas para investigación, Me han explicado que la información registrada será confidencial, y que la encuesta y no registrara los nombres de los participantes, y que los resultados de los exámenes de entrada y de salida serán manejados de forma privada manteniendo mi anonimato en todo momento , esto significa que las respuestas no podrán ser conocidas por otras personas ni tampoco ser identificadas en la fase de publicación de resultados esto con el propósito de que se realice a conciencia sin ningún tipo de presión laboral o social. Estoy en conocimiento que los datos no me serán entregados y que no habrá retribución por la participación en este estudio, sé que esta información podrá beneficiar de manera indirecta a los docentes de educación física en general y por lo tanto tiene un beneficio para la sociedad y grupos poblacionales con los que el IDERF trabajara en el fututo dada la investigación que se está llevando a cabo. Asimismo, sé que puedo negarme a la participación de la investigación y también puedo retirarme de la investigación en cualquier momento y solo debo decir que no quiero continuar, sin expresión de causa ni consecuencias negativas para mí o mi trabajo,.

Acepto voluntariamente participar en este estudio y he recibido una copia del presente documento.

_____ _____

Firma Fecha

Si tiene alguna pregunta durante cualquier etapa del estudio puede comunicarse con John Freddy Cortés Cortés, Cel: 3005676143, aspirante a Magister en mediación pedagógica del aprendizaje del inglés universidad Nacional Abierta y a Distancia Unad.

Appendix E Entry test

The content of the exam is presented below. It is essential to highlight that this exam has been developed using the tools available on the Moodle platform such as (drag and drop, interactive listening, H5P plug-in for pronunciation recordings, and then its immediate correction, among others).

Page 1: Read the text and fill in the gaps using the vocabulary below related to P.E.

Every morning, the students arrive at the field with their soccer 1____ and soccer cleats. The coach gathers them and reminds them to wear their shin guards. First, they practice passing and shooting at the goals. Juan 2_____ the ball to Ana, who 3____ it straight into the net and scores a 4_____. Everyone celebrates while the 5_____ applauds. Then, they form teams and play a match.

Shoes-Coach-Net-Shoots-Shin Guards-Passes-Goal-Team-Referee.

Page 2: Listening to the following Text and Completing it.

Every afternoon, the students go to the 6_____ with their basketball. First, they practice shooting at the basket. Juan throws the ball and scores in the 7____. Then, Ana takes the ball and dribbles down the court. The coach says "pass the ball," and Ana passes the ball to Carlos. Carlos shoots, and the ball bounces off the 8_____ before going into the net. Everyone celebrates the 9_____. Afterward, they play a 10 _____. Juan's team defends while Ana's team tries to score. At the end, the coach says "Good job!" and the students go home happy.

Audio script:

Every afternoon, the students go to the gym with their basketball. First, they practice shooting at the basket. Juan throws the ball and scores in the hoop. Then, Ana takes the ball and dribbles down the court. The coach says "Pass the ball," and Ana passes the ball to Carlos. Carlos shoots, and the ball bounces off the backboard before going into the net. Everyone celebrates the point.

Afterward, they play a game. Juan's team defends while Ana's team tries to score. At the end, the coach says "Good job!" and the students go home happy.

Page 3: Write correctly the following words in English.

Every morning, the students get ready for their 11_____. Pedro always brings his 12_____ and towel. Ana adjusts her 13_____ and puts in her mouthguard before starting. The coach uses a 14_____ to time the exercises. After an intense session, everyone dries off with their towels. The 15_____ smiles and tells them they did a great job.

11 Entrenamiento

12 Termo

13 Banda para la cabeza

14 Cronometro

15 Entrenador

Page 4: Record the pronunciation of the following words, please pronounce them when they appear on your screen, it is going to appear 10 different words, and the H5P plug-in will give you the answer immediately for each word you pronounce.

16 Stadium

17 Jersey

18 Court

19 Swimsuit

20 Goggles

21 Bat

22 Kick

23 Rim

24 Dumbbell

25 Goalkeeper

Appendix F Exit test

The content of the exam is presented below. It is essential to highlight that this exam has been developed using the tools available on the Moodle platform such as (drag and drop, interactive listening, H5P plug-in for pronunciation recordings, and then its immediate correction, among others).

Page 1: Read the text and fill in the gaps using the vocabulary below related to P.E.

Every afternoon, students arrive at the 1_____ wearing their shoes and uniforms. The coach uses his 2_____ to start practice. First, they practice dribbling and passing the ball. Then, Ana makes a layup and Juan tries a 3_____, but the ball bounces off the rim. Carlos takes the 4_____ and passes the ball to Sara, who shoots a jump shot that goes into the basket. The coach applauds and tells them "Good job!" while preparing a 5_____ play.

Pick and roll- whistle- gym-dribble-time out-rebound- three-point shot

Page 2: Listening to the following Text and Completing it.

For every training session, students arrive at the 6_____ to practice. Pedro receives the ball and crosses it towards Ana, who tries to head but fails. The ball goes over the baseline and the opposing team has a 7_____. The _____, Juan, makes a great save after the shot. Then Carlos commits a foul and the referee awards a 8_____. Ana takes the free kick and Pedro makes a perfect assist to Juan, who scores a goal. The coach is happy, but the game doesn't end there. After a strong tackle, the ball goes out of bounds and Ana's team has a 9_____. In the end, the referee signals a 10_____ for the opposing team, but Juan, the goalkeeper, makes another incredible save. Everyone celebrates his performance.

Audio script:

For every training session, students arrive at the soccer field to practice. Pedro receives the ball and crosses it towards Ana, who tries to head but fails. The ball goes over the baseline and the opposing team has a corner kick. The goalkeeper, Juan, makes a great save after the shot. Then Carlos commits a foul and the referee awards a free kick. Ana takes the free kick and Pedro makes a perfect assist to Juan, who scores a goal. The coach is happy, but the game doesn't end there. After a strong tackle, the ball goes out of bounds and Ana's team has a throw-in. In the end, the referee signals a penalty kick for the opposing team, but Juan, the goalkeeper, makes another incredible save. Everyone celebrates his performance.

Page 3: Write correctly the following words in English.

Every morning, the students gather in the gym for their physical education class. They start with 11_____ and 12_____ exercises to prepare their muscles. The coach uses a stopwatch to time their activities. First, they do push-ups to build strength. Then, they move on to 13_____ drills, practicing quick movements and coordination. After that, they work on 14_____ exercises, standing on one leg and using balance boards. To finish, they perform 15_____ activities like running laps around the gym. Throughout the class, they focus on improving their flexibility and overall fitness. The coach encourages them, saying, "Good job! Keep building your strength and endurance."

11 calentamineto

12 estiramiento

13 agilidad

14 equilibrio

15 resistencia

Page 4: Record the pronunciation of the following words, please pronounce them when they appear on your screen, it is going to appear 10 different words, and the H5P plug-in will give you the answer immediately for each word you pronounce.

16 Strength

17 Stopwatch

18 Rim

19 corner kick

20 header

21 Jump shot

22 Cones

23 Whistle

24 Tackle

25 Balance

Appendix G Survey

Survey applied to P.E. teachers

Link: https://forms.gle/ShQGpPy1qsWkJbTF6

Survey Physical Education teachers

A partir de las experiencias vividas en el desarrollo del "VLE para el mejoramiento del vocabulario en ingles en los docentes de educación física", favor desarrollar la encuesta con total honestidad.

¿Crees que el curso te permitió mejorar tu vocabulario de manera lúdica y divertida?

Sí, totalmente de acuerdo
En cierta medida
No, para nada de acuerdo

¿Consideras que las temáticas vistas en el curso son significativas para el desarrollo profesional de tu carrera?

Sí, completamente significativas
Sí, en cierta medida significativas
No, no son significativas

¿Consideras que las temáticas vistas en el curso son significativas para el desarrollo profesional de tu carrera?

Sí, completamente significativas
Sí, en cierta medida significativas
No, no son significativas

¿Te sientes motivado y comprometido con el aprendizaje de contenidos y lengua extranjera en este curso?

Sí, totalmente motivado y comprometido
En cierta medida
No, para nada motivado y comprometido

¿Según su experiencia está de acuerdo con que el aprendizaje en línea le permitió una mayor flexibilidad en cuanto a horarios y lugares de estudio?

Totalmente de acuerdo
De acuerdo
Neutral
En desacuerdo

Totalmente en desacuerdo

¿Considera usted desde la experiencia vivida que el aprendizaje en línea puede ser una buena opción para personas con horarios laborales ocupados y limitado tiempo para dedicar a la educación?

Totalmente de acuerdo
De acuerdo
Neutral
En desacuerdo
Totalmente en desacuerdo

¿Crees que el aprendizaje en línea puede ser una alternativa viable para las personas que viven en áreas geográficas remotas o tienen dificultades para desplazarse a un campus físico?

Totalmente de acuerdo
De acuerdo
Neutral
En desacuerdo
Totalmente en desacuerdo

¿A partir de la experiencia vivida cree usted que el aprendizaje en línea puede ser tan efectivo como la instrucción tradicional en el aula?

Totalmente de acuerdo
De acuerdo
Neutral
En desacuerdo
Totalmente en desacuerdo

En tu opinión, ¿el acceso a recursos multimedia, como videos y ejercicios interactivos, contribuyó positivamente a tu comprensión y retención de los conceptos enseñados?

Totalmente de acuerdo
De acuerdo
Neutral
En desacuerdo
Totalmente en desacuerdo

Basándote en tu participación en el curso en línea, ¿crees que el autonomía y la autodisciplina son aspectos esenciales para tener éxito en este tipo de modalidad educativa?

Totalmente de acuerdo

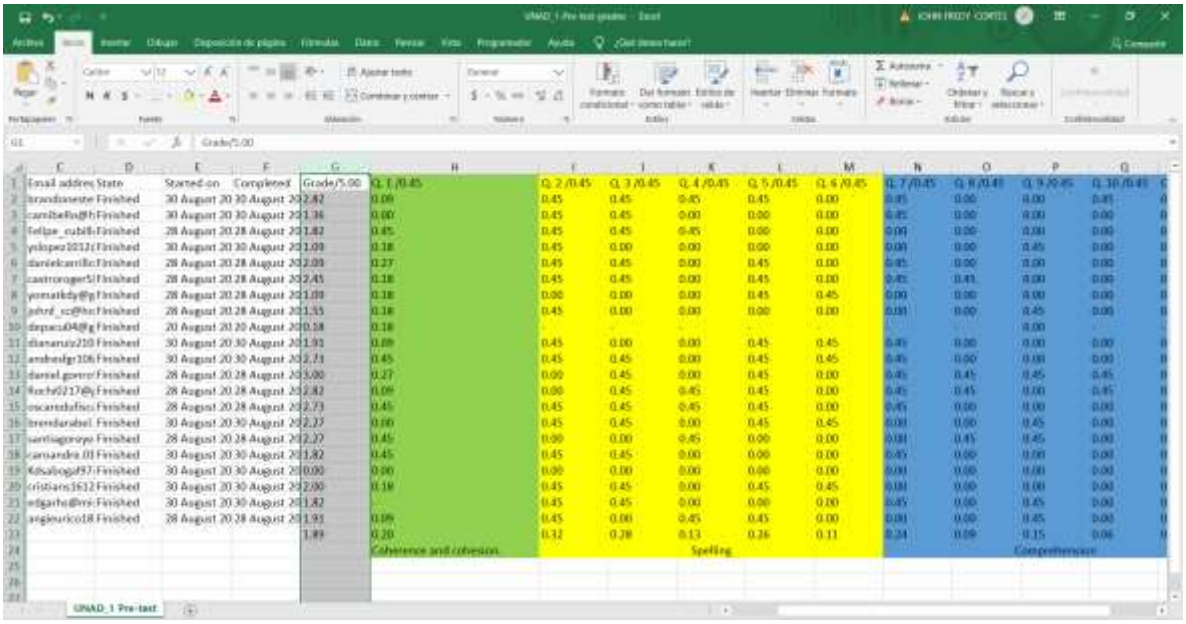
De acuerdo
Neutral
En desacuerdo
Totalmente en desacuerdo

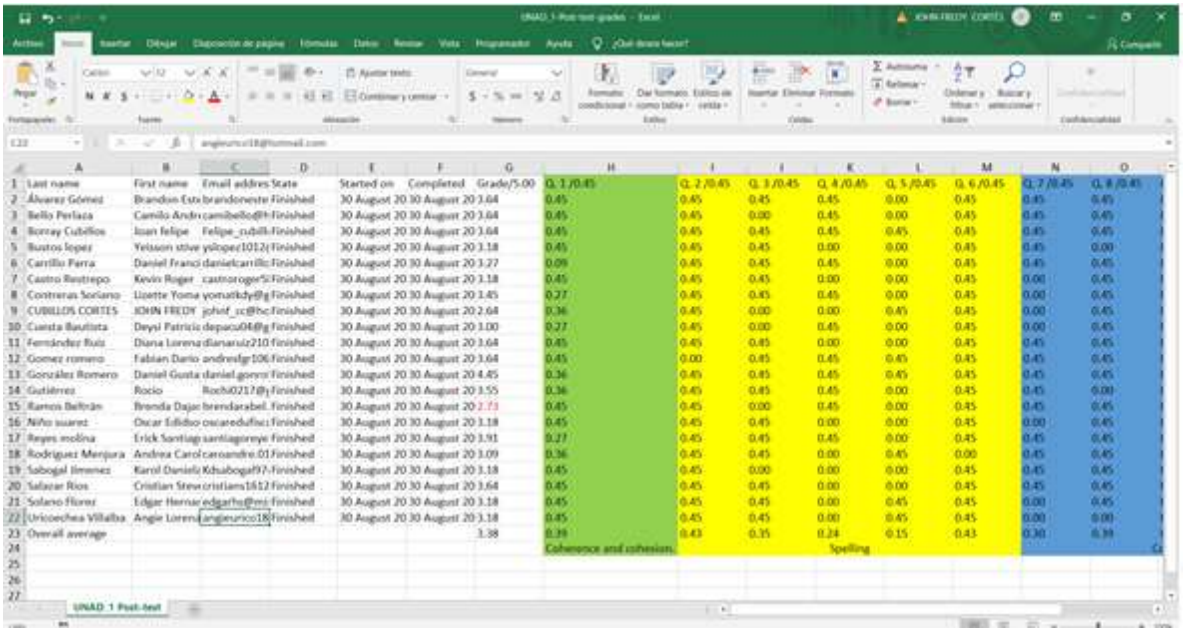
Cuales de los siguientes recursos considera usted que fueron mas significativos en su aprendizaje?

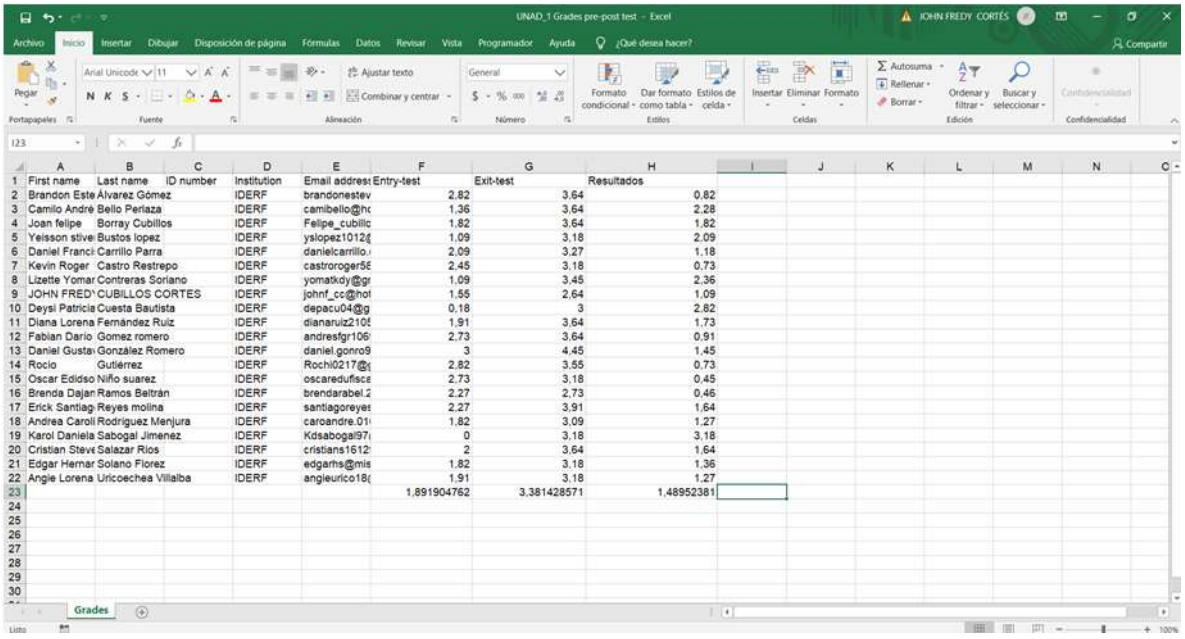
Los videos y presentaciones explicativas.
Los ejercicios de comprensión auditiva.
Los ejercicios de pronunciación.
las actividades interactivas tales como: ejercicios de completar espacios, emparejamientos.
Los juegos interactivos.
Ninguna de las anteriores.
Todas las anteriores.

Appendix H Data tabulation charts

Below are the tabulation tables as a result of the entry and exit examinations. A question-by-question comparison was made in both exams, calculating the difference in the results of each teacher. Additionally, a general average of the two exams was performed to evaluate overall improvement. The results clearly show individual differences and average progress, providing a detailed view of the impact of VLE on vocabulary learning.







UNAD_1 Grades pre-post test - Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	First name	Last name	ID number	Institution	Email address	Entry-test	Exit-test	Resultados							
2	Brandon Este	Álvarez Gómez		IDERF	brandonestev	2,82	3,64	0,82							
3	Camilo André	Bello Periaza		IDERF	camilbello@hc	1,36	3,64	2,28							
4	Joan felipe	Borray Cubillos		IDERF	Felipe_cubillc	1,82	3,64	1,82							
5	Yeisson stive	Bustos lopez		IDERF	yslopez1012(	1,09	3,18	2,09							
6	Daniel Franci	Carrillo Parra		IDERF	danielcarrillo.(	2,09	3,27	1,18							
7	Kevin Roger	Castro Restrepo		IDERF	castroroger5(	2,45	3,18	0,73							
8	Lizette Yomar	Contreras Soriano		IDERF	yomatkdy@gr	1,09	3,45	2,36							
9	JOHN FRED\	CUBILLOS CORTES		IDERF	johnf_cc@hot	1,55	2,64	1,09							
10	Deysi Patricia	Cuesta Bautista		IDERF	depacu04@g	0,18	3	2,82							
11	Diana Lorena	Fernández Ruiz		IDERF	dianaruiz210(	1,91	3,64	1,73							
12	Fabian Dario	Gomez romero		IDERF	andresfgr106(	2,73	3,64	0,91							
13	Daniel Gusta	González Romero		IDERF	daniel.gonro9	3	4,45	1,45							
14	Rocio	Gutiérrez		IDERF	Rochi0217@(	2,82	3,55	0,73							
15	Oscar Edidso	Niño suarez		IDERF	oscaredufisca	2,73	3,18	0,45							
16	Brenda Dajan	Ramos Beltrán		IDERF	brendarabel.2	2,27	2,73	0,46							
17	Erick Santiag	Reyes molina		IDERF	santiagoreyes	2,27	3,91	1,64							
18	Andrea Caroli	Rodriguez Menjura		IDERF	caroandre.01(	1,82	3,09	1,27							
19	Karol Daniela	Sabogal Jimenez		IDERF	Kdsabogal97(	0	3,18	3,18							
20	Cristian Steve	Salazar Rios		IDERF	cristians1612(	2	3,64	1,64							
21	Edgar Hernar	Solano Florez		IDERF	edgarhs@mis	1,82	3,18	1,36							
22	Angie Lorena	Uricoechea Villalba		IDERF	angieurico18(	1,91	3,18	1,27							
23						1,891904762	3,381428571	1,48952381							
24															
25															
26															
27															
28															
29															
30															

Grades