Implementing a Virtual Learning Object based on electricity content to strengthen inferential reading comprehension skill in undergraduate distance students of Technology in Industrial Electricity at UPTC

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Resumen

El presente estudio apoyado en la investigación acción, se fundamenta en el diseño e implementación de un OVA basado en contenido relacionado con la electricidad que busca fortalecer la habilidad de lectura inferencial en las clases virtuales de inglés con 14 estudiantes de pregrado de la facultad de estudios a distancia pertenecientes a la Universidad Pedagógica y Tecnológica de Colombia, los cuales se encuentran entre los 18 y 38 años. Las implicaciones de este estudio incluyen no solamente un beneficio al proceso académico de los estudiantes, sino que, debido a la naturaleza reutilizable del OVA, este enriquecerá a la comunidad educativa, especialmente la comunidad de la educación a distancia. Por medio de este OVA se implementaron una serie de ciclos de lectura relacionados con la electricidad, basados en las estrategias de tres fases de Solé (1992) las cuales se conformaban por actividades de antes, durante y después de la lectura y por el tercer nivel de las estrategias de comprensión de lectura de la taxonomía de Barret. En cada ciclo de lectura se recolectó información a través de la observación directa, notas de campo, encuestas cualitativas en línea y pre y post test para así comprender el impacto de la intervención pedagógica. Los resultados sugieren un aumento en la habilidad de lectura inferencial de los estudiantes, gracias a la implementación del OVA; sin embargo, se recomienda que la Universidad realice talleres de manera transversal con las otras asignaturas del programa dirigidas al desarrollo de esta habilidad específica para evidenciar un desarrollo más notorio en esta habilidad.

Palabras clave: Objeto Virtual de aprendizaje, lectura, habilidad de lectura inferencial, E-learning, Electricidad.

Abstract

This paper reports an action research study founded on the design and implementation of a VLO based on electricity to strengthen inferential reading comprehension skill in online English classes with 14 undergraduate distance students at UPTC who are between 18 and 38 years old. The implications of this study include not only the benefit of the student's academic process but due to the reusable nature of the VLO, it will enrich the educational community, especially the distance learning one. In the development of the VLO the teacher-researcher implemented a series of one hour reading cycles about electricity content, based on the Solé's (1992) three-phase strategies made up of before, during and after the reading activities and the Barret's Taxonomy's third level of reading comprehension strategies. In each reading cycle with the VLO were collected data through direct observation, field notes, online qualitative surveys and pre and posttest to understand the impact of the pedagogical intervention. Findings suggest an increase in the participants inferential reading comprehension skill; however, it is recommended that the educational institution holds workshops transversally with other subjects directed to the development of this specific skill so that students continue to improve in this regard.

Keywords: Virtual learning object, reading, Inferential reading comprehension skills, E learning, Electricity.

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Introduction

Reading skill is the cognitive and linguistic process in which an individual understands and decodes the message written by an author with the purpose of acquiring knowledge and discovering the world. In this conscious and unconscious thinking process, the reader reconstructs the author's ideas by comparing information in the text to his or her background knowledge and prior experience (Mickulecky, 2008). The fact that the students really comprehend and give meaning to what they read allows them not only to internalize and master new information, but also to improve the relationship that they have with reading and learning. But reading comprehension not only implies understanding the exact words of the author in a text but also to exercise the individual higher mental abilities with the inferential comprehension, that implies having the critical and reflective capacity to reach deeper deductions and conclusions in relation to what is not implicitly written in a text as well as to improve the language comprehension and learn new vocabulary that enriches the English language level and communication skills. But how can we as teachers seek to enhance distance students' inferential reading skills in the English language area? Technology is a great means when it comes to improving the educational experiences; the use of online learning together with the design and implementation of a Virtual learning object (VLO) that enable students to demonstrate an improvement in this type of reading comprehension skill is the way in which the present study carried it out.

Rationale of the Study

Reading comprehension plays an important role in the process of learning a foreign language, it not only allows the student to measure their knowledge of the target language by understanding or not the determined text and to acquire new vocabulary and grammatical

structures that contribute favorably to learning but also to carry out a process of thinking, reasoning, deducting and comparing the message behind the written words with their own context, which is known as inferential comprehension. This research was made under the premise that “Reading for a purpose provides motivation - an important aspect of being a good reader” (Bojovic.M, 2010); however, making students feel engaged towards reading in English when they do not have a reading culture and have not been exposed to reading in a foreign language could be a challenge for English Teachers. That is the reason why this research was carried out with a group students of the distance technology program in Industrial Electricity of the UPTC who did not have the necessary autonomy to review the contents and proposed readings by themselves, which hindered their learning process, especially the inferential reading comprehension skills for which it was sought to design in this study a virtual learning object (VLO) focused on the development of inferential reading comprehension skill in order to generate strategies that allow students to show an improvement in this type of skill, which would not only favor the academic part of the students but also due to the reusable nature of the VLO it would greatly enrich the educational community, especially the distance one.

Scope and Limitations of the Research

The coverage and expectations of this research were to analyze how the implementation of a VLO based on electricity content could strengthen inferential reading comprehension skill in Online English classes with undergraduate distance students at UPTC. Bearing this in mind, it is important to highlight the limitations that this study had; first, considering that this research was carried out in a public University, it was possible that the time established for the completion of the study may be slightly altered, since academic practices could disrupt the normal development of classes and therefore increase the time taken for the research. A second limitation that the

teacher researcher could find were the student's difficulties with internet connectivity, which could complicate the realization of virtual sessions and the development of the investigation. The third and final limitation of this research was the lack of responsibility that some students could have towards the subject and the research process which could slow down the process and alter the results of the investigation.

Context of the Research Problem

The current investigation was developed at Universidad Pedagógica y Tecnológica de Colombia, a national, state and public university with branches in Duitama, Sogamoso and Chiquinquirá and whose main campus is located in the city of Tunja, Boyacá. This study was carried out at the Faculty of Distance Studies of the University (FESAD), whose mission is to contribute to the construction and dynamization of processes for the development of autonomous learning, promoting the growth of cognitive, procedural, attitudinal, communicative and investigative skills in students, based on the pedagogical and technological mediation, for the formation of autonomous, critical and creative professionals. The School of Technological Sciences belongs to this faculty. It has programs in Civil Work Technology, Technology in Industrial Electricity, Technology in Telematics, Professional Technician in Production and Transformation of Steel, Technology in Management of Production and Transformation of Steel, Technology in Machines and tools and Technology in Programming of Computer Systems. According to the pedagogical model of the Faculty of Distance Studies, from the holistic conceptions of being, knowledge, research and technological practice as pillars of training, this program seeks to develop in the student skills such as autonomy, self-motivation, study habits, the construction of their own learning process, critical thinking and the promotion of ethical values, foundations that are in total agreement with the objectives of the current study.

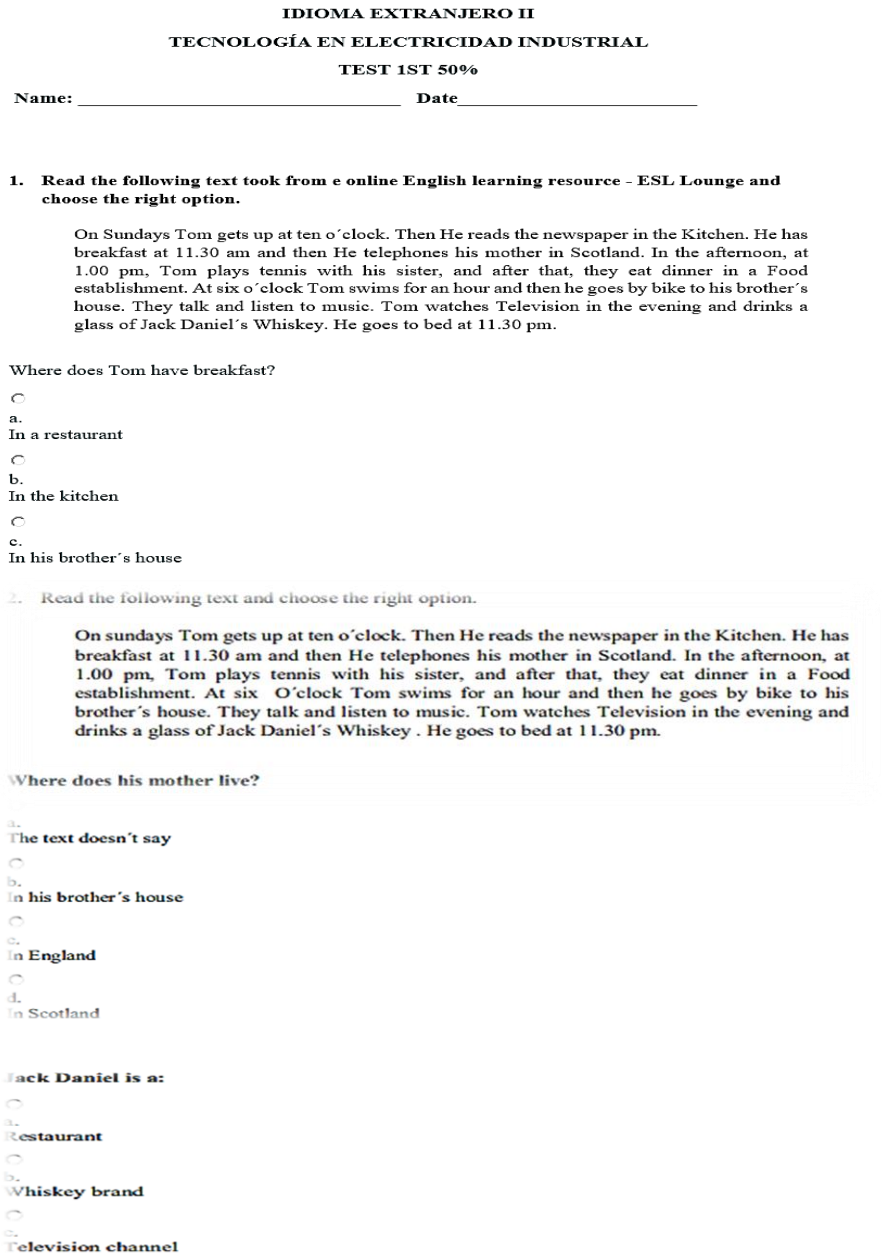
Bearing the above information in mind, this study was implemented with a group of fourteen male students of the second level of English who were part to the Technology in Industrial Electricity program. The students in this program are expected to acquire the necessary tools to communicate in English at the two levels of English required in the second and third semesters, to function satisfactorily in academic, work, and technical contexts. The methodology implemented in the English sessions is E-learning, which is characterized by allowing the learning process to be carried out virtually through any electronic device, which allows the student to access the learning of the foreign language from anywhere. Regarding the communication process between students and the tutor, it is developed through the platform under which the course is implemented, which is the Moodle platform. The sessions are carried out in a synchronous and asynchronous way, being the synchronous sessions the ones that take place on Saturdays and one day a week in the evening through communication tools such as Zoom or Google Meet. In accordance with the foregoing, this methodology presents some drawbacks since even though the teacher conducts synchronous class sessions according to the schedule established by the faculty of distance studies and that the Moodle Platform presents a very complete material to support student learning, not all the students have the engagement and the necessary autonomy to review the topics and to read carefully the readings proposed on the platform, arriving at synchronous class sessions without having carried out previous study work and recognition by platform, which hinders their own learning process. Likewise, although in the curriculum of the program the students have a subject called study methods where they learn reading and writing techniques, due to the technologic characteristic of the program this subject has a much more directed approach to the proper management of APA or ICONTEC format of

writing, the different types of text, the learning spaces of distance education and new technologies than in the development and promotion of reading comprehension strategies.

This problematic was also manifested not just in English synchronous sessions but also in the ratings of a test that the students took at the end of the first half of the semester in the English subject, where they presented deficiencies in reading comprehension, especially when making inferences about elements that were not visible and specific in the corresponding text and in a virtual survey carried out with students (see from figure 1 to figure 8) where they affirmed that they did not have the culture of reading, but they saw the need to improve their performance in this particular skill, which in the future semesters may be very beneficial for them since they could improve their performance when interpreting readings in English on the Standardized test of the Quality of Higher Education, Saber TyT which "is a standardized evaluation instrument for the external measurement of the quality of higher education that evaluates the competencies of students who are about to complete the different professional technical and technological programs" (Instituto Colombiano para la Evaluación de la Educación – ICFES, 2021*).* The following table and figures correspond to the exam given to the students 'sample of this study in the first quarter of the semester as well as the percentage of students who failed that exam. In this exam, students were asked to read some texts in English of an appropriate length and content for their level of English; after which they were asked to answer some proposed questions in order to measure their inferential reading comprehension skills; after analyzing the results obtained in this exam (See table 1) it become evident that more than half of the students who took the exam (57.1%) had deficiencies in inferential reading comprehension skills, as a consequence they did not pass the exam.

Figure 1

Pretest Page One



IDIOMA EXTRANJERO II

TECNOLOGÍA EN ELECTRICIDAD INDUSTRIAL

TEST 1ST 50%

Name: _____ **Date**_____

1. Read the following text took from e online English learning resource - ESL Lounge and choose the right option.

On Sundays Tom gets up at ten o´clock. Then He reads the newspaper in the Kitchen. He has breakfast at 11.30 am and then He telephones his mother in Scotland. In the afternoon, at 1.00 pm, Tom plays tennis with his sister, and after that, they eat dinner in a Food establishment. At six o´clock Tom swims for an hour and then he goes by bike to his brother´s house. They talk and listen to music. Tom watches Television in the evening and drinks a glass of Jack Daniel´s Whiskey. He goes to bed at 11.30 pm.

Where does Tom have breakfast?

a.
In a restaurant

b.
In the kitchen

c.
In his brother´s house

2. Read the following text and choose the right option.

On sundays Tom gets up at ten o´clock. Then He reads the newspaper in the Kitchen. He has breakfast at 11.30 am and then He telephones his mother in Scotland. In the afternoon, at 1.00 pm, Tom plays tennis with his sister, and after that, they eat dinner in a Food establishment. At six O´clock Tom swims for an hour and then he goes by bike to his brother´s house. They talk and listen to music. Tom watches Television in the evening and drinks a glass of Jack Daniel´s Whiskey . He goes to bed at 11.30 pm.

Where does his mother live?

a.
The text doesn´t say

b.
In his brother´s house

c.
In England

d.
In Scotland

Jack Daniel is a:

a.
Restaurant

b.
Whiskey brand

c.
Television channel

*Note.*The readings proposed in all the pages of the pretest were taken from public use web pages cited in the references of this document.

Figure 2

Pretest Page Two

3. Complete the phrase by using the right preposition of place:

There are two students _____ the class.

a. in

b. over

c. in front of

d. next to

4. Read the text took from brainly.lat and choose *True* or *False*.

Last night Mr. and Mrs. Rojas stayed home. It was cold and rainy and they didn't want to go out in the bad weather. Mrs. Rojas made some popcorn and ice tea. At 8:00, Mr. and Mrs. Rojas went into the living room, sat on the sofa and began the movie and ate and drank. At 8:15, Mr. and Mrs. Rojas realized they already watched the movie last year and they didn't want to watch it again.
"Now what?" asked Mr. Rojas. "Let's play cards!" answered Mrs. Rojas. At 8:30 Mr. and Mrs. Rojas started to play cards. They were playing for about 10 minutes when Mr. Rojas looked out the window. The rain changed to snow and the trees were covered in beautiful white snowflakes. "I'm happy we stayed home tonight. It looks beautiful outside but this weather is very dangerous to drive in." said Mr. Rojas. "You're right," said Mrs. Rojas, "but I'm bored. Let's play some music and dance."
Mr. Rojas was surprised. "Dance? But I really don't …."
"Oh come on!" Mrs. Rojas insisted. She put on a romantic CD and they both started to dance. They were dancing for about 1 minute when suddenly the music stopped and the lights went out. Mrs. Rojas laughed. "We're just not very lucky tonight, are we?" she said. Mr. Rojas said, "Of course we're lucky! We are together!" He kissed her and continued to dance with her, in the dark and without music.

1. Mr. and Mrs. Rojas left their house at night because they wanted to enjoy the rain.

True

False

2. Mr.and Mrs. Rojas were going to see a movie but they realized that they had seen it before, so they played cards.

Figure 3

Pretest Page Three

○ True

○ False

3. Mr. and Mrs. Rojas danced a little rock and roll and then they took a walk in the snow.

○ True

○ False

4. Mr. and Mrs. Rojas kissed in the dark and continued dancing without music

○ True

○ False

5. Read the following text took and adapted from liveworksheets.com and answer the questions.

BEHIND THE DOORS 

The children crept through the house, trying hard to keep their footsteps silent. They made their way to the spare bedroom and looked around. Glimmers of moonlight shone into the room, barely lighting up the old furniture that lay within. They moved towards the ancient wardrobe, unsure what they would find inside but feeling curiously drawn towards it. Their hands were shaking, and their hearts were racing. Both children took a deep breath in and quickly opened the doors. With a loud screech, the doors swung open, revealing a bright light within. They peered in cautiously and saw a mysterious and strange world hidden in the back of the wardrobe. The trembling children took a hesitant step towards the strange new world, eager to discover what lay within!

1. Why the children were trying to be quiet?

○ a. They were in a test

○ b. They were scared

○ c. They were in a library

2. Do you think that the story happened during the e day or at night?

○ a. The day

○ b. At night

3. How do you think the children felt before opening the doors?

○ a. They were happy

○ b. They were tired

○ c. They were nervous

Good Luck! ☺

Table 1

Pretest Results

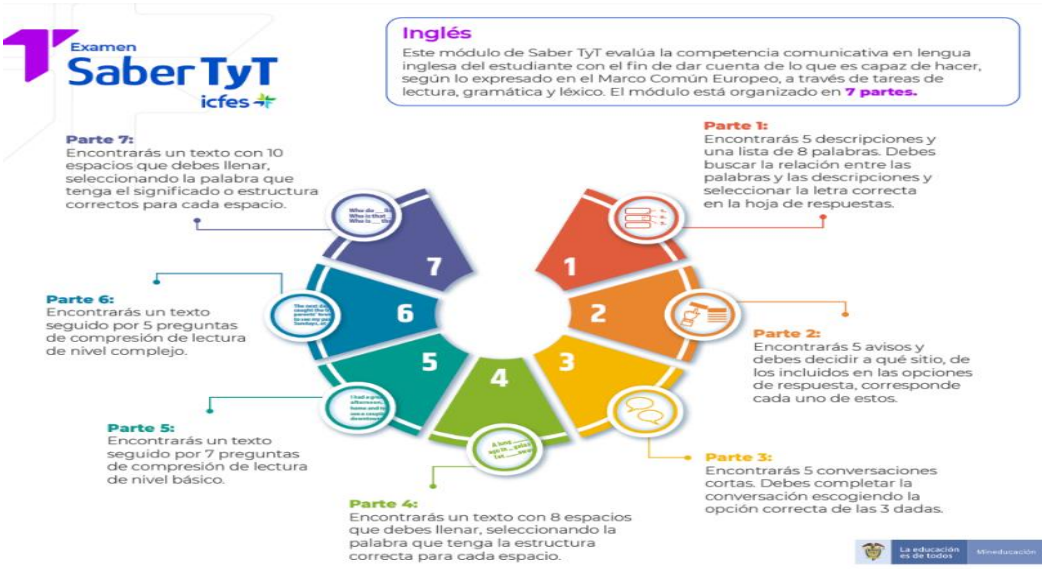
Number of Students	Students Who Approved the Exam	Students Who Failed the Exam	Percentage of the Students Who Failed the Exam	Percentage of the Students Who Approved the Exam	Total
14	6	8	57,1	42,9	100,0

Note. This table shows the results obtained by the students in the pretest.

The results of the exam were compared with the results obtained by the students of the Technology in Industrial Electricity Program of the UPTC in the English module of the Standardized test of the Quality of Higher Education Saber TyT in 2022. According to the above, it is worth highlighting the functioning of the 45 questions of the English module, which can be answered in one hour and are organized in 7 parts as follows:

Figure 4

Examen Saber TyT

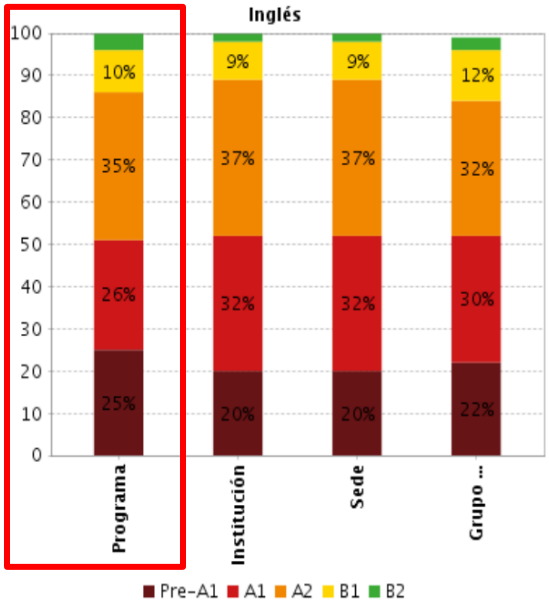


Note. Took from the oficial webpage of the *Instituto Colombiano para la Evaluación de la Educación – ICFES.* 2022, https://www.icfes.gov.co/documents/39286/8761866/Infograf%C3%ADa+Ingl%C3%A9s+Saber+TyT+2022-2.pdf

According to the Common European Framework of Reference for Languages (- A1, A1, A1, A2, B1 and B2) The 25 % of the students of the Technology in Industrial Electricity Program Technology in the year 2022 were at the level -A1, the 26% of the students were at level A1, the 35 % of the students were at level A2, the 10% of the students were at level B1 and the 4 % of the students were at level B2 as can be seen in figure 5:

Figure 5

Results of the Program Students Who Took the Saber TyT Test in the Year 2022



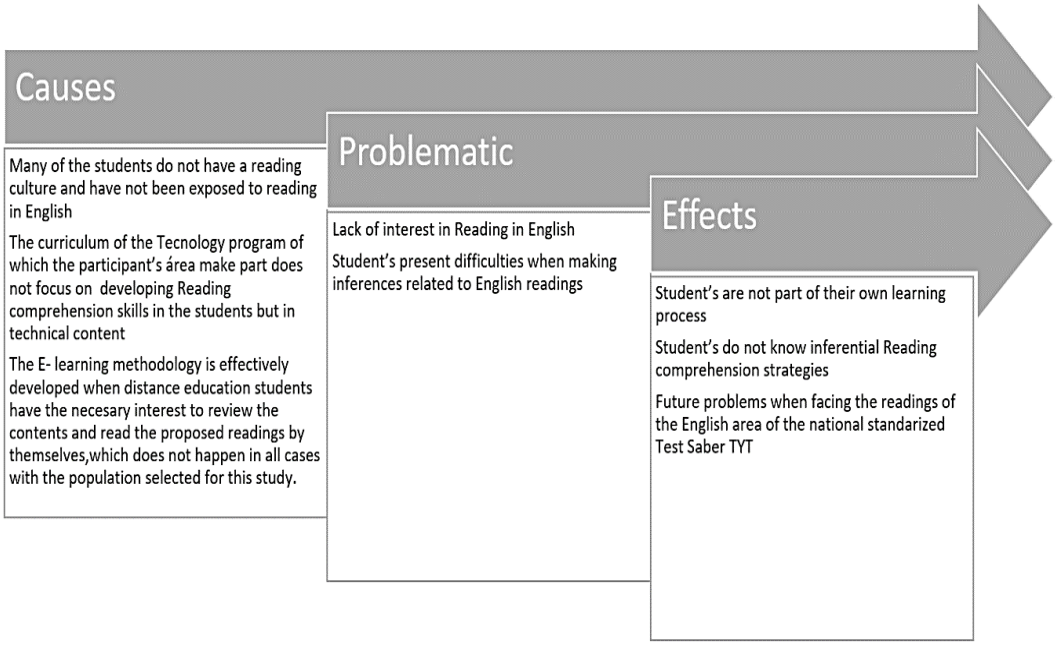
Note. Took from the oficial webpage of the *Instituto Colombiano para la Evaluación de la Educación -ICFES.*(2023).https://www.icfes.gov.co/acerca-del-examen-saber-tyt

According to the above, the 86% of the students of the technology in industrial electricity program who took the standardized test in 2022 were at a foreign language proficiency level A1 and A2. Regarding the previous analysis, the grades of the English exam carried out by the student sample of this study in the first fifty percent of the semester of the year 2023 and reviewing the results of the survey mentioned above, it became evident to the teacher researcher the need to seek and implement new methodologies or approaches that allows her (and that can help future teachers of virtual or distance modalities) to perform a work that was much more in line with the needs of students; therefore considering the deep interest that students had in the subject of electricity, in this research the readings of the English subject were oriented towards

simple topics related to the Industrial Electricity program, implemented according to the distance nature of the program in a Virtual Learning Object(VLO) developed in an online context with the purpose of enhancing the participant's reading comprehension skills, specially the inferential reading ones. This information is shown in the table below:

Figure 6

Context Diagram



Note. Diagram adapted from *Problem and objective tree analysis*, by the Overseas Development Institute, (n.d) Odi. https://www.measureevaluation.org/resources/training/capacity-building-resources/basic-me-concepts-portuguese/problem_tree.pdf

In that sense, through the results of this research it was expected that through the inferential reading strategies that would be proposed in the VLO reading cycles, distance students could gradually strengthen their inferential reading comprehension skills.

Research Question

How the design and development of a Virtual Learning Object (VLO) based on electricity content can strengthen the inferential reading comprehension skill in online English classes of a group of undergraduate distance students of the UPTC?

Research Objectives

General Objective

To design and develop a Virtual Learning Object (VLO) based on electricity content to strengthen inferential reading comprehension skill in online English classes with undergraduate distance students at UPTC.

Specific Objectives

To identify the level of inferential reading comprehension skills among undergraduate distance students at UPTC.

To develop a VLO based on electricity content that incorporates activities and tasks that promote inferential reading comprehension skills.

To evaluate the effectiveness of the VLO in improving inferential reading comprehension skills among undergraduate distance students at UPTC.

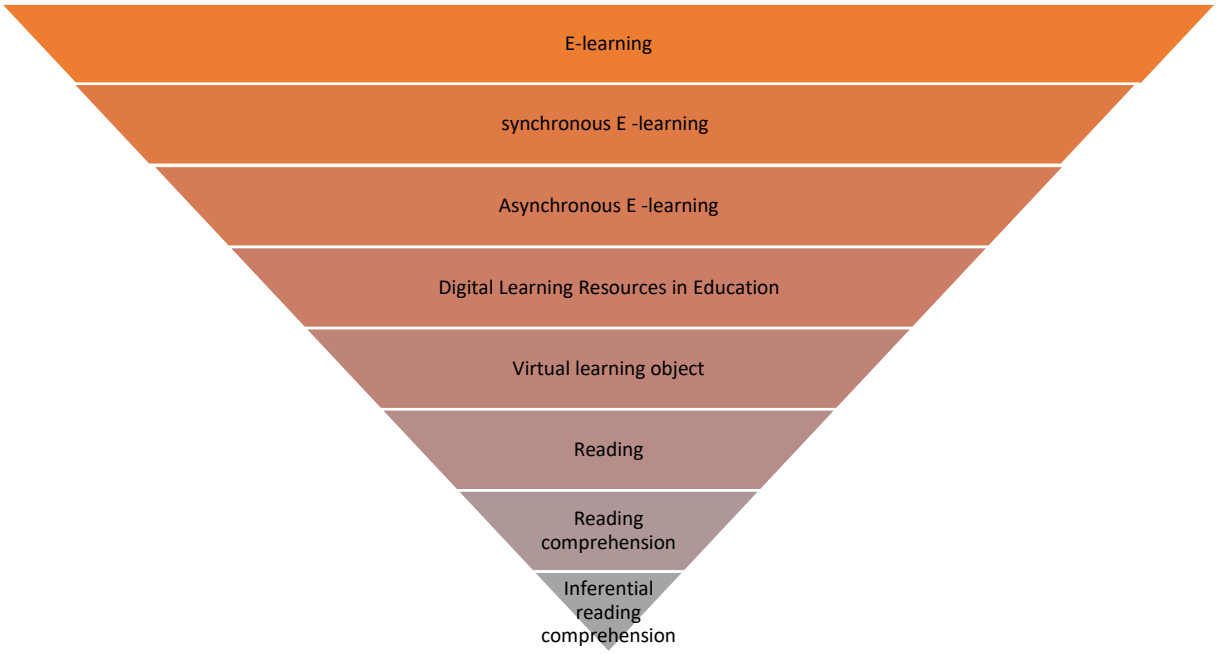
Literature Review

Conceptual Framework

In this section the teacher-researcher explored several constructs that emerged from the research question such as: E- learning, Synchronous- E learning, Asynchronous E -learning, Digital Learning Resources in Education, Virtual learning Object, reading, reading comprehension and Inferential Reading comprehension. Taking into the account this information the figure that the reader will find below will allow him to understand the way in which the aforementioned constructs are developed in this chapter.

Figure 7

Constructs



Note. Graphic designed by own authorship.

Theoretical Framework

E-Learning

In accordance with the distance nature of the Technology in Industrial Electricity program, the methodology implemented in the English sessions is E-learning, where learning is carried out through electronic resources making it much more accessible. Accordingly, the teacher-researcher decided to delve more deeply into this construct.

Teaching and learning in an E-learning environment happens differently than in the traditional classroom (Showkeen, B.2015), it unites two main areas, learning and technology (Aparicio et al, 2016); based on the latter it improves classroom engagement through positive environment, where students are deliberately engaged in online tutorials for completing a task assigned (Al Rawashdeh et al, 2021). This type of learning conducted by different electronic devices that have internet access such as computers, smartphones or tablets facilitates the communication and collaboration of the student by the teacher, favoring their learning opportunities, since they can have access to a more flexible education, which permit them to keep a record and control over their respective study times and learning process, allowing them to be much more responsible and autonomous and at the same time creating a relaxed and enjoyable environment where they can learn anytime, anywhere (Maruf & Anjely, 2020).

As mentioned above, E- learning has several advantages for education: in words of Allaa. et al, (2021) this type of learning has been viewed as the ability to focus on the requirements and needs of individual learners, whose learning objectives are achieved in a shorter period of time than in traditional education and access to it is available regardless their gender, race, nationality and location. This also allow students to get deeper insights of the information received through activities that are carried-out in the virtual classroom through interactive video facility (Gautam

and Tiwari, 2016; Martínez-Caro, Cegarra-Navarro and Cepeda-Carrión, 2015 cited by Al Rawashdeh. et al, 2021), readings and interactive review activities embedded through E-Learning Management System (LMS) such as Moodle platform, which also perform three common functions: presenting and systematizing training content, create assignments to test and solidify knowledge, to evaluate progress (Marks et al, 2016) which significantly facilitates, simplifies and centralizes the learning process (Muruthy & Yamin, 2017, cited by Allaaet al 2021).

Just as it is possible to find many advantages in the implementation of E-learning in virtual classrooms, it also has some disadvantages, for instance it promotes the tendency of isolation and lack of discipline (Muhammad et al, 2021), which makes it difficult for students to adapt to this type of learning. Another disadvantage of E- learning is that students who are not used to virtual classes may feel a great lack of motivation, procrastination tendency, decreased interest in reading (Muhammad et al, 2021) and indifference in the classes, which can trigger a rejection of the subject or even the drop out of the institution. In accordance with the above, this study sought to combat the deficiency in inferential reading comprehension through the design of a virtual learning object based on the Electricity content.

With the intention of adapting to the needs and educational contexts of the students, E-learning can be carried out in a synchronous, asynchronous and hybrid way; due to in this research project the first two constructs were developed, these were the ones that will be discussed in more detail below.

Synchronous E-Learning. According to Amiti, F. (2020) the synchronous learning "is an environment where the teacher and the students meet online on a specific online platform for teaching and communicate about a lesson"; additionally, Xie et al (2018) affirmed that

synchronous e-learning involves instructor-learner interaction and learner-learner interaction. Likewise Murray,M.(2007) affirms that this term cannot be confused with self-paced asynchronous learning, “which students access intermittently on demand”; In that sense, synchronous learning fosters a constant bidirectional exchange of information in real time that promotes social engagement and allows students to solve doubts immediately, thus avoiding the lack of motivation and the feeling of isolation; however in words of Davidson-Shivers et al., (2001)“it requires scheduling shared times for students and instructors, often across different time zones and is prone to technical challenges and accessibility limitations related to strength of Wi-Fi”, therefore, students who have strict work schedules do not usually adapt well to this learning environments.

In words of Lim, P. (2017) the synchronous communication tools are the following:

1. Video conferencing
2. Web Conferencing
3. Audio conferencing
4. Live chat
5. White boarding
6. Application sharing

Regarding the above information, to carry out this research video conferencing were implemented through the Google meet video conferencing service.

Asynchronous E-Learning. Unlike the previous E-learning type, asynchronous E-learning favor the communication process in delayed time; that is without the need for the

participants to meet connected at the same time or geographical area; the Email and the forum are clear examples of this type of tools. (Ríos &Rodríguez, n.d), likewise in words of Doo,

(2009) cited by Xie et al (2019) “it is a standalone approach, planned particularly for self-study, with which the learner and instructor work separately”.

Regarding the advantages of the asynchronous learning, students have access to course support material and class recordings at any time and place, which makes it more flexible and convenient for people who cannot attend face-to-face institutions due to their specific context; in that sense the teacher-researcher agrees with Perveen (2016) cited by Amiti,F.(2020) when he affirms that “asynchronous environments provide students with readily available material in the form of audio/video lectures, handouts, articles and power point presentations. This material is accessible anytime anywhere.” (p.22). Besides, even though this type of learning does not occur in a social setting and in a real and immediate context, students can communicate or interact with the teacher and clarify existing doubts through the above-mentioned tools. Likewise, students who take part in this learning could develop critical thinking skills in a more effective way, since they do not have to give the teacher an immediate answer, but on the contrary, they have time to reflect on the topic addressed. With respect to the disadvantages of asynchronous E- Learning, it can be a bit overwhelming for students who were used to studying in person, as they may feel they need more attention and support from the teacher and peers, which can cause lack of interest. Likewise, it requires a lot of self-discipline on the part of the student, which in many cases does not occur and the student presents problems in carrying out the learning process.

Digital Learning Resources in Education

Because the main objective of the present investigation was to design and develop a Virtual Learning Object (VLO) based on electricity content to strengthen inferential reading comprehension skill in online English classes with undergraduate distance students at UPTC, it is

mandatory that in this chapter the teacher- researcher delves in detail into the construct of digital learning resources in education.

In words of Diaz, A. (n.d) “Digital learning resources are electronic resources such as applications (apps), software, programs, or websites that engage students in learning activities and support the learning goals of students”. According to Garzón & Pabón (2021) “they are innovative tools designed to capture our attention, actively engage us and most importantly, make learning a personal and memorable experience”. This kind of sources allow the teacher to make the learning environment more comfortable, interactive, available, appealing, personalized, and flexible to the student’s needs while at the same time deploy their digital skills and evaluate the acquired knowledge. Additionally, in words of Rivera, A. (2021) Digital learning resources “become mediating tools not only for completely virtual teaching, but also for hybrid modalities […], These types of resources will pave the way for an educational culture based on collaboration, cooperation and equality.”

According to Garzón & Pabón (2021), digital learning resources can be classified as digital content, learning tools and collaborative resources; however, Wang et al. (2019) add to this list the Virtual Reality Learning Resources. Regarding the previous information the Digital content includes e-books, podcasts, videos, infographics, and any other content that can be consumed digitally, while the learning tools are platforms and applications designed to facilitate learning, which include learning management systems (LMS), language learning applications, MOOC platforms and more. Likewise, the collaborative resources promote collaboration and knowledge sharing, its true power lies in its ability to bring people together, facilitating the exchange of learning; they include forums, academic social networks, group project platforms, among others. Finally in words of Wang et al. (2019) Virtual reality learning resources can

reflect the real situation and interact with the virtual world through wearable devices. For the development of this research, digital content (such as Videos, pictures or slides), learning tools (such as a Virtual learning object) and collaborative resources (such as Google Meet) were implemented as digital learning resources.

Virtual Learning Object. Virtual Learning Object (VLO) is part of a philosophy in developing a digital teaching material and is mainly used in virtual education (Mora,.F.2012); it can be understood as a pedagogical mediator intentionally designed for a learning purpose for the student to have contact with real language (Hernández.,S, 2019).The VLO is not an informative object which only provides certain information to a specific public, but is a self-containing digital entity elaborated to be used by means of a computer that presents a precise educational objective, contents and learning activities suitable for the realization of specifies learning objectives, that may contain theories, explanations, didactic resources, activities, practice exercises and evaluation, to facilitate the study and understanding of a topic of a programmatic content of a subject or digital equipment. (Córdova., J, 2016).

Referring to Chiappe Laverde, A. (2009) the word self-contained refers to all the resources that the VLO must incorporate to fulfill the educational purpose for which it was designed, which must facilitate the student's access. It is important to highlight that as indicated the above-mentioned author, a virtual learning object can be also an open object (that make use of external resources) if it achieves the stated learning objective; characteristic that was implemented in the virtual learning object designed for this research.

Virtual Learning Objects provide several benefits for language learners, they encourage English learning in an interactive way (Nappa & Pandiella, 2012 cited by Hernández et al, 2019) develop reading skills in EFL and self-confidence in students (Arias-Soto et al, 2011). They also

have some important features such as accessibility, flexibility, reusability, durability, educability, interactivity, and adaptability (Muñoz Arteaga et al. 2006, cited by Hernández et al, 2019) which is essential to adapt the course or subject to the needs of distance education students. It is important to highlight that the use of VLO in the virtual learning environments should not only be concentrated in the training of knowledge, but also generate a learning environment that integrates the development of other communication skills such as reflection, critical thinking, and decision making (Piña et al, 2015) which is of great importance to improve inferential reading in distance learners, that was one of the main objectives of this research.

Reading

Reading is a very important construct in this study, it is from this skill that the inferential reading is generated; according to Hellekjaer (2009), cited by Hernández,S.(2019) It "comprises decoding the written text on the one hand and efficiently processing the information on the other hand"; likewise it is "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (International Literacy Association, 2023). In words Bedle, S. (2017) "reading is a selective process involving taking cues from known language (knowledge of both vocabulary and grammar in the text) upon which the reader makes decisions about the meaning of the text", which involves a great deal of cognitive capacity available for comprehension (Pressley, 2002 cited by Karbalaei, A. 2010).

Reading is an indispensable skill when learning a foreign language, it allows students to learn new vocabulary, improves their spelling skills, writing skills and in words of Lalicic & Dubravac (2021) it facilitates the development of literacy skills that everyone needs for effective communication in different contexts. There are four types of reading techniques: Intensive reading, extensive reading, skimming and scanning; in the former technique the students read in

detail each word of a text with specific learning tasks, in words of Brown (1994) cited by Zuhriyah,M. (2018) intensive reading "calls attention to grammatical forms, discourse markers, and the surface structure details for the purpose of understanding literal meaning, implications, rhetorical relationships, and the like"; in the extensive reading the reader read a text "for enjoyment and to develop general reading skills"(British council, n.d); in words of Hafiz and Tudor (1989) cited by Suleiman, H.(2006) "the pedagogical value attributed to extensive reading is based on the assumption that exposing learners to large quantities of meaningful and interesting L2 material will, in the long run, produce a beneficial effect on the learners' command of the L2." Regarding the skimming and scanning Liao (2011) cited by Qismullah et al (2017) "skimming is done at a speed three to four times faster than normal reading; readers often skim when they have masses of materials to read in a limited amount of time", in that sense skimming readers used to keep just the main idea of a text or the most relevant information; likewise scanning is reading rapidly in order to find specific facts(Dewi, 2022;Basuki, 2018, cited by Fatmawan et al (2023). Based on the objectives of this research, when reading the texts proposed in the VLO reading cycles, the participants made use of extensive reading.

Reading Comprehension. Reading comprehension is the process of creating meaning from text (Kintsch, 1998, and van Dijk and Kintsch 1988, cited by PourhoseinGilakjani, A.2016) it is a complex task that occurs together with the reader, text and social context involved, which according to Branch, L.(2016) "helps learners decoding a text, analyzing, explaining, and expressing their own ideas about written materials", this author also affirms that "reading comprehension needs different reading skills such as word recognition, fluency, lexical knowledge, and pre-existing knowledge to be undertaken quickly so that the reader gets knowledge from text", it depends on reader's experience and knowledge about the

language, sentence structure and repetition of reading text, difficulty and length of the reading text (Kintsch and Kozminki, 1977; Lipson and Wixson, 1991; Diakidoy, Stylianou, Karefillidou an Papageorgiou, 2005 cited by Ayfer, S.(3013). In addition Hare and Milligan (1984) cited by Qismullah et al (2017) affirm that "the ability to identify main ideas in a text is an important key to reading comprehension" however, the author states that this is not the only important thing, since the reader must also remember the content of the text at the end of the reading process and being able to infer the hidden concepts and ideas found on it.

Inferential Reading Comprehension. Since this research focused on generating meaningful improvements in English inferential reading comprehension, the teacher-researcher concentrated on delving deeper into this construct. Inferential comprehension is one of the three main aspects of reading comprehension, which are literal comprehension, inferential comprehension, and critical comprehension (Cheek et al 1989, cited by Valentine et al, n.d). Inference is a process that make the reader move from a simple interpretation of individual sentences to a global meaning that integrates multiple sentences (Best et al., 2005 cited by Tarchi, 2012).

Teaching students to read in an inferential way helps them to read more strategically (Valentine et al, n.d) since it allows them to go beyond what is written on the page and add meaning or draw conclusions (Suhadi, 2016); whereas literal reading helps grasp surface-level textual meaning, inferential reading understanding helps interpret the text and transcend it (Charlemagne, C. 2015). Referring to The Thompson TDA model (2019) when readers make inferences, they expand their comprehension by establishing an understanding of vocabulary, the background of the events or situation and the domain or topic knowledge. Students who develop inference skills are more engaged in the text. They not only understand better but also enjoy

reading more because they are able to easily draw on information from their own lives and prior knowledge (Jumriani, 2016) to arrive at these deductions and hypothesis (Valentine et al, n.d.).

Strategies to Enhance the Inferential Reading Comprehension Skills. According to the Barret's Taxonomy's third level of Reading comprehension (1974) it is possible to make inferences by implementing a series of subtasks, which are inferring supporting details in a text, inferring about the main idea presented in a text, inferring sequence where the student will provide hypotheses about what may have happened after the situation described in the text or between two specific moments or times, inferential comparisons related to different elements that compose a text such as times, characters, places or ideas, inferring cause and effect relationships and the nature of a character, interpreting figurative language and make predictions about an outcome of a selected part of a text, which in words of Banditvilai, C. (2020) is an strategy that fosters students predictions about a texts based on the information they read, the pictures they see or the title they analyze; to generate these predictions the readers can also rely on their previous experiences and background knowledge "which increases students' interests and improves their understanding of the text". Solé (1992) cited by Hernández & Méndez (2018) supports the implementation of this strategy by stating that prediction consists of establishing "adjusted and reasonable hypotheses about what will be found in the text, based on the interpretation that is built on what has already been read and on the reader's knowledge and experience".

Those reading strategies are implemented as affirmed Solé (1992) cited by Durán, N. (2019) according to the moment they occupy in the act of reading (three-phase strategy -before reading, while reading and after reading). In words of Almacıoğlu &Toprak (2010) before reading activities "introduce students to a particular text, elicit or provide appropriate

background knowledge, and activate necessary schemata (Ibid: 16)", those activities include brainstorming, discussing about the author or type of test they will read considering illustrations and titles, predict the content of the text and watching videos about reading passages. Continuing with the reading phases Solé (1992) cited by Avedaño, Y. (2020) affirmed that in while Reading phase the teacher should read some fragments of the text, but taking advantage of his or her speed should observe the learner's work in order to engage comprehension; in that sense as affirm Almacıoğlu &Toprak (2010) while reading activities "help students develop reading strategies, improve their control of the foreign language, and decode problematic text passages". Those strategies include "perform readings aloud, which allows analysis and rereading, extract main and secondary ideas through brainstorming" (Durán.N, 2018), practice exercises such as inferencing the meaning of unknown words by using context clues, word formation clues, ask themselves questions about the text (clarifying doubts from the information read) and doing a dictionary search for unknown words. Finally, in the after reading phase the content of the text is recapitulated, what has been read is summarized and the knowledge acquired through the lecture is extended. Those activities include quiz questions, summary writing and writing outlines. The reader will find the implementation of those strategies in the activities and evaluation questions reflected in the virtual learning object designed for this study.

Taking to account the above information in this research each unit of the VLO was designed based on the Solé's (1992)three-phase strategies (before, while and after the reading), in which through the proposed reading comprehension tips and suggested activities the following reading strategies were implemented: Predicting outcomes, inferring the main ideas from a text, inferring supporting details (these first three strategies are based on Barret's Taxonomy's third level of Reading comprehension), inferring the meaning of unknown words by using contextual

clues, reading aloud and extracting the main and secondary ideas of the text, the formulation of hypotheses about what the reader will find in the text while reading it, clarify doubts from the information read by asking oneself questions and reading comprehension quizzes.

State of Art

In this chapter the teacher-researcher will explore the international, national and local studies that have been written in relation to the content addressed in this study, thus seeking to broaden Her's own vision of the way in which these concepts have been addressed in different research studies similar to the present one. It should be noted that since there are not many studies related exclusively to the development or improvement of inferential reading comprehension skills through the design of a VLO in the context of English language education for distance learners, some of the studies analyzed in this section are concerned with the development of Reading comprehension, information that greatly supported this research.

The Effect of Moodle E-Learning Material on EFL Reading Comprehension is an exploratory study carried out in 2020 by Hijril Ismail, Aceng Rahmat and Emzir. This research was of great importance for the present study because it exposed that with the development of appropriate strategies through the implementation of the E-learning methodology it is possible that students improve their reading comprehension skills, which was the objective of this study. In words of Hijril Ismail, Aceng Rahmat and Emzir (2020) E- learning is of great importance at the moment of enhancing the development of the reading comprehension skills, therefore they decided to investigate the effect that the Moodle e-learning has on the on EFL reading comprehension of a group of 27 EFL college students. The data collection process was achieved by means of pretest and posttest of the reading comprehension skill, performing the analysis of this data by means of three face tests of normality, homogeneity test and hypothesis test.

Regarding the results, the researchers found that the implementation of Moodle E- learning “has a significant effect on improving students’ reading comprehension” (Hijril et al, 2020, p.1) and recommended its application to improve the students reading comprehension skills.

The next international investigation analyzed was *The Effectiveness of Reading Strategies on Reading Comprehension* developed by Banditvilai, C. (2020). This research aimed to investigate the effectiveness of reading strategies on reading comprehension of the second-year English major students (who studied English Reading at the faculty of Liberal Arts and Science, Kasetsart University in Thailand) and the applicability of these strategies learned by students in their reading process. This research was of great importance for the present one since it implements some reading strategies that allow students to improve this skill, recognizing the importance of placing these strategies at an appropriate reading time (Before, during and after the reading).Likewise the author highlights the strategies of Skimming, Scanning, making predictions and questioning, strategies that in the case of the last two, were also implemented in this study. Regarding the data collection instruments used in this investigation, the data were collected from a questionnaire, reading tasks and semi-structured interviews. As for the results of this study the author exposed that the mentioned reading strategies had a positive effect on the students’ reading comprehension, being able to apply these strategies in their reading process, which allowed them to better understand the texts.

Another international study analyzed in the present one was *An Analysis of Students’ Ability in Reading Comprehension by Using Barrett’s Taxonomy at English Department Universitas Negeri Padang*, carried out by Purnamasari & Trisno (2022). This descriptive research was of great importance for this investigation since, as can be seen from the title, it goes deeper into the use of five levels of the Barrett's taxonomy (literal comprehension,

reorganization, inferential comprehension, evaluation, and appreciation)in the analysis of reading comprehension, a taxonomy on which the teacher-research was based (specifically the third level related to inferential reading) to design some of the inferential reading strategies proposed in the VLO designed for the current study. Purnamasari & Trisno's (2022) investigation was developed with a group of twenty-eight students from the 2018 English Language Education study program of the Universitas Negeri Padang in Indonesia. The instruments used to collect the data were a reading comprehension test (with 50 multiple-choice questions) which the students completed individually in ninety minutes and a questionnaire adapted from Taladngoen (2020) that consisted of nineteen items questions. As for the results, it can be seen that in spite of carrying out the study, the students' reading comprehension skills are in the poor category with a total average score of 53.86, which according to the authors suggests that the majority of students present difficulties in comprehending the questions in form of evaluation. As for the factors that affect language comprehension, the authors of the study indicated that they are the students' linguistic knowledge (65.48%), students' perception (63.04%), lecturer influence (62.50%), family influence (46.88%), and environment (59.52%).

The reading and analysis of the following international and national investigations were of great relevance for this study as they apply the reading comprehension strategies of an important author for the present investigation such as Solé (1992) to increase students reading comprehension skills. Regarding the international research, through the implementation of these strategies the author sough to increase the reading comprehension levels (literal and inferential) of the selected population, which allowed the teacher-researcher not only to understand a little more about the strategies proposed by this author and reaffirm the importance of the three reading phases but also to analyze the employability of those strategies and its effectiveness in an

educational population. This quasi-experimental research developed by Avendaño,Y.(2020) was called *Influence of the reading strategies of Isabel Solé in the reading understanding of the educandes of fifth grade of primary*; it applied Isabel Solé's strategies in a fifth grade primary school group at Educational Institution No. 146 su Santidad Juan Pablo II -San Juan de Lurigancho in Lima, Perú and exposed the importance of interactive methodological strategies to increase the levels of reading comprehension, taking into account the interactive model of Solé (1992) where the author states that the "strategies must be applied throughout the reading process so that way the motivation, the vision of what is going to be achieved, are present and these will lead the child to understand what he is reading," (Avendaño, 2020, p. 97). Likewise, this research exposes the importance of the reading phases or moments where the author affirmed that the before, during and after the reading moments allow the student to activate prior knowledge, make predictions about the content of the text, develop shared reading, independent reading strategies and obtain the main idea of the text.

Taking into account that based on Solé's reading comprehension levels: literal, inferential and critical, this research sought to increase the student's reading comprehension levels (literal and inferential), therefore, the instruments used for data collection were texts from selected readings, prepared considering the MINEDU Reading Plan (2017) and the Internet as a source and a Reading Application Program, which contained 10 texts to be applied to the experimental group in a period of two months in the time of two pedagogical hours corresponding to the development of the reading plan, according to the Study Plan developed by the students. Regarding the results, it can be seen that through the implementation of Sole's (1992) reading strategies, the improvement of the students' literal and inferential reading comprehension was largely achieved.

Regarding the quasi-experimental national study called *Estrategias de lectura de Solé para el desarrollo de la comprensión lectora en las estudiantes del grado 4º de la IE Normal Superior Manuel Cañizales de Quibdó -Chocó* carried out by Hurtado, S. (2022), she evaluated the impact of Solé's reading strategies on twenty nine fourth graders' reading comprehension skills through twelve group and individual work sections based on Solé's reading strategies (before, during and after reading); regarding the author of the research each situation was closed with an evaluative activity. The instruments used to collect data were a survey, standardized tests and a flied diary.

Based on the results of the mentioned study, the author concluded that the use of reading strategies improves participants' reading comprehension, allow them to identify the purposes of reading, establish predictions in the texts read, predict the end of a story, present ideas related to the understanding of the text and focus on the main content of the text.

As another national study, the teacher-researcher analyzed the Hernández's S. (2019) investigation called *A Virtual Learning Object (VLO) to Promote Reading Strategies in an English for Specific Purposes Environmen*t with a group of students of a private institution of higher education in Bogota, Colombia. The data collection was carried out by interviews, a sample of the participant's reading cycle reports, questionnaires and self-assessment of progress. Regarding the results of this national study, the author affirmed that VLO designed promoted "the participants' appropriation of reading strategies proposed in the design of the course" (Hernández, 2019, p.106); she also affirmed that the VLO not only prompted the student's higher reading comprehension, but also facilitated and enriched their learning experiences. As a result, the VLO promotes reading strategies for ESP courses, which happened due to the learning objectives stablished, the selected text, topics and the selection of games and activities that were

linked to the student's needs. The researcher also affirmed that "the development of reading strategies constitutes the core of a successful pedagogical intervention and that the support of a VLO contributes to it" (Hernández, 2019, p.109). The previous study was of great value for the current one as it demonstrated the importance of promoting reading comprehension strategies in students through digital resources that strengthens their reading comprehension skills, appeal their attention and allow them to understand the importance of the reading culture. Likewise, in terms of reading comprehension strategies, this research reaffirmed the importance of the implementation of before, during and after the reading strategies since they help students to activate their previous knowledge, establish connections with the proposed reading, summarize, question and reflect on the text they have read.

Regarding the local studies, in this research was analyzed an investigation called *Propuesta para el uso de estrategias Didácticas que mejoren el nivel de Compresión lectora y promuevan el aprendizaje autónomo en los Estudiantes de Grado Tercero B de la Institución Educativa Magdalena Sede Sogamoso Boyacá* which was carried out by Navarrete, J. D. (2016) with a group of 28 third graders between an age range of 7 to 11 years. This local monograph shows the importance of developing the reading comprehension to enhance the autonomous learning, for which it seeks to propose strategies through reading workshops, playful activities, reading days for third grade B students of the Magdalena Educational Institution in Sogamoso, Boyacá. The data was collected by surveys, a field diary, a reading-related checklist to verify if students develop the strategic reading activities in an autonomous way. Regarding the results, the author affirmed that the development of didactic strategies will foster interest in reading, and students will learn about them as tools to better understand what they read. It was identified that the students did not have the habit of reading and the students had difficulty in understanding

what they read, which according to the author can have negative future consequences such as: school failure, grade repetition and in the worst case, school dropout, school failure, grade repetition and, in the worst case, school dropout. The author also indicates that in the reading process it is important to consider the cognitive development of the child and the student's reality in order to propose activities that articulate reading with their real context. This will allow the student to relate reading to their cultural and social identity. As for the development of autonomous learning, this study is very important to the current one since it exposed how by the use of the strategies related to reading comprehension students can develop by themselves the reading processes and find solutions to the different problems that may arise.

Another local study that was analyzed in the current research was *Comprensión lectora desde medios digitales en estudiantes de educación básica primaria* by Neva, O. (2021). This research developed with the group of fourth and fifth graders took place in the municipality of Chivata (Boyacá), in the Agricultural Technical Educational Institution of Chivata. According to the author this qualitative research had as a main objective “to analyze the incidence that digital media have on reading comprehension, from classroom and non-classroom practices” (Neva, 2021, p 19). Taking into account the corresponding ethical considerations the author exposes that the data was collected by a field diary and some teachers and student’s interviews, through which it was possible to evidence that the presentation of reading skill in multiple modalities and digital media facilitated reading comprehension for children who somehow had access to digital media, otherwise this was not the case and children read from printed texts which made it difficult to draw unidirectional conclusions about the benefits of digital texts. Despite this, the author affirms that digital media change the nature of reading and redirect preconceptions about reading comprehension: making necessary a new literacy to contribute to the search for meaning,

increase motivation in students and promote collaborative learning. This last local research was of great value for the current investigation since it expanded the researcher's view of the importance of knowing the context and the needs of the students to promote the skills in which they are lacking, in this case, inferential reading comprehension skills. Besides, as the author of this research mentions, the situations of the contemporary world and of the students should lead the teacher to rethink the pedagogical practices, so this research favored such reflection in relation to the importance of leaving the pigeonhole imposed by traditional education and constantly evolve as teachers in the use of technological learning resources and readings in digital formats that represent a different way of approaching reading, which can trigger the improvement in the reading comprehension by students.

The final Local study analyzed in this research was the Durán's, N. (2018) research called *Estrategias pedagógicas para el desarrollo de la lectura inferencial*, which was developed by a group of twenty-five fifth graders from a school called Institución Educativa Técnica Agrícola de Paipa. This qualitative research was of great importance for the present one since it focuses on the analysis of the inferential reading comprehension skills of the selected population through the investigation of the use of discontinuous texts, likewise in this research the data was collected by means of surveys and workshops. It is worth noting that the mentioned research emphasizes some theories and strategies focused on the development of inferential reading such as the strategies employed by Solé (1992), an author who as the teacher-researcher mentioned before has great relevance in the present investigation; among these strategies were found some inferential reading strategies such as doing predictions, hypotheses and anticipations which in words of Blanco, (2005)cited by Durán's, N.(2018) "serve to propose a context, and also directly apply the activation of prior knowledge" (Durán, 2018, p.375).Another strategy

highlighted in this research is that of questioning the text (established in the pre-reading phase), which is closely related to the strategy mentioned above; this reading strategy allows the reader to ask questions about what he or she knows about the text, which brings previous experiences to the present and at the same time allows the reader's interest in the text to grow; other strategies proposed by Solé (1992) are the realization of hypotheses about the content of the text and what will happen later in the same one, the clarification of doubts about what has been read, where the reader asks himself questions with the intention of checking the comprehension of the text and the recapitulation of important elements of the text read. Regarding the results, the author affirmed that "the study of the different theories allows us to conclude that several authors recognize the importance of prior knowledge in the development of the inferential capacity to understand a text" (Durán, 2018, p.379) as well as the implementation of varied texts that allow the reader to interpret the Colombian reality. Finally, the author exposes the importance of the accompaniment of the educational community and parents to promote reading in students.

Thanks to the theoretical support collected in this chapter the main strategies on which the teacher researcher relied to strengthen the inferential reading comprehension skills in students through the design and development of a VLO based on electricity are exposed in the table above:

Table 2

Main Authors

Author	Reading Strategies
Isabel Solé (1992)	Three-phase strategies (Before, while and after the reading) Infer the meaning of unknown words by using contextual clues. Read aloud and extract the main and secondary ideas of the text. Formulation of hypotheses on the text Clarify doubts from the information read by asking oneself questions. The implementation of reading comprehension quizzes Make inferences by contrasting reader previous experiences with the information in a text.
Thomas C. Barrett (1968)	Barret's Taxonomy's third level of Reading comprehension (Predicting outcomes, inferring supporting details)

Note. Table designed by Ángela Vanessa Duarte Infante

Research Design

Introduction to the Research Design

This chapter presents the study's research approach, the type of research implemented by the teacher-researcher to conduct the study and answer the research question, the context of the research, the piloting and validation process, the data collection techniques and the pedagogical intervention and application.

Research Approach

This research project followed a qualitative approach. Denzig and Lincoln (2005) describe qualitative research as an "involving…and interpretive, naturalistic approach to the world", which means that this type of research investigates people's experiences, behaviors, attitudes, and interactions in their natural settings. In this study, qualitative approach was implemented to analyze and understand how the design and development of a Virtual Learning Object based on electricity content could strengthen the inferential reading comprehension skill in online English classes of the study's participants.

Type of Research

With the purpose of answering the question stated in this research, the researcher carried out action research that according to Burns (2015) "It is related to the ideas of 'reflective practice' and 'the teacher as researcher'. AR involves taking a self-reflective, critical, and systematic approach to exploring your own teaching contexts". She also affirms that "The aim is to identify problematic situations or issues considered by the participants to be worthy of investigation in order to bring about critically informed changes in practice" (Burns, cited in Cornwell 1999, p. 5). Considering the above, this type of study was carried out through the action cycle of planning, action, observation and reflection, which was implemented as follows:

Planning

In this part of the action cycle, the researcher implemented a pre-test that the students took at the end of the first half of the semester in the English subject, where after reading a series of simple texts in English they had to answer reading comprehension questions in which it was evident that they presented deficiencies in reading comprehension, especially when making inferences about elements that were not visible and specific in the text. The results of this test was compared with the results obtained by students of the Technology in Industrial Electricity program of the UPTC in 2022 who took the Standardized test of the Quality of Higher Education Saber TyT, specially the English module, where it could be seen that the 86% of the students were at a foreign language proficiency level A1 and A 2 (see figure 4 and figure5). Likewise, the teacher-researcher conducted a virtual survey to the students where it was evident that they saw the need to improve their performance in this skill (see Figure 8). To solve this situation, the teacher-researcher carefully planned and designed the virtual learning object based on electricity content (which was a topic that the students were passionate about and interested in) to enable them to improve their inferential reading comprehension skill.

This Virtual Learning Object was established as a suitable resource to achieve the objective of this study, since is a digital resource that makes learning English and reading a memorable and meaningful experience that as affirms Wiley (2002) cited by Hernandéz, S,(2019) “are more relevant in teaching and learning practices when the content and virtual functional quality are presented in a more attractive way for students to start working on reading activities”.

In words of Chiappe,A.(2009) “ Un objeto de aprendizaje se entiende como una entidad digital, autocontenible y reutilizable, con un claro propósito educativo, constituido por al menos

tres componentes internos editables: contenidos, actividades de aprendizaje y elementos de contextualización"(Chiappe,2009,p. 263), likewise a VLO should be well designed and structured so it facilitates the student to analyze the information with a critical sense (Agudelo, C et al., 2022 p.38)facilitating the development of inferential reading comprehension through the strategies proposed therein. In view of the foregoing, the VLO designed for this study was divided into introduction, learning objectives, a pre-knowledge activity, guidelines, the three reading cycles (before, while and after the reading, each one with the correspondent inferential reading comprehension tip) where students found interesting readings and reading comprehension activities to strengthen their inferential reading skills, a further feedback part where students could find the answers to the activities proposed in each unit, conclusions and finally references and credits.

Bravo, R. N. (2016) states that VLOs must be adaptable, durable and accessible, characteristics that are also present in this VLO, since its main structure, the reading comprehension activities and reading cycles proposed can be modified by external teachers who wish to adapt it to the needs of their students, it can be continuously updated and used over time and it is fully accessible to anyone with minimal internet connectivity.

To see the resource planning in a more detailed way, see the following table:

Table 3

Resource Planning and Design

	Resource Planning
Main Language Topic	The main topic of the VLO is the reinforcement of the students' inferential reading comprehension skill in English
Problem	The educational problem found by the teacher researcher was that the population of the study had difficulties in the English learning specially the inferential reading comprehension skills in this language. Considering the aforementioned, the teacher researcher intended to solve this educational problem by implementing along with the development of English synchronous classes, the design of a virtual learning object focused on electricity content that incorporates activities and tasks that promote inferential reading comprehension skills, which in accordance with their needs, results attractive, eye-catching and increases their interest in reading.
Learning Outcomes	1. At the end of the course students will be able to recognize the historical figures who had an impact on the history of electricity. 2. Students will be able to identify how electricity works and to infer what are the types of existing clean energies. 3. Students will be able to distinguish the use of the simple present and past simple tenses. Students will be able to illustrate the safe or unsafe actions regarding the use of electricity.

	4. Through reading students will be able to infer the meaning of the vocabulary related to electricity. 5. The student will be able to determine the increase or decrease in their inferential reading comprehension skills.
Target Population	The VLO was designed for fourteen male students who belong to the faculty of Distance Studies of the UPTC in the Technology in industrial Electricity program.
	Resource Design
Type of Resource	Virtual Learning Object - VLO
Tool Selected to Create the Resource	The tool I selected to design the VLO was Google sites. This is a tool of easy access and intuitive navigation with which the student can go through each of the elements that make up the VLO. It is also a very complete tool that allows the insertion of different multimedia files such as videos, pictures, articles, forms, games and documents, which allows the VLO to be very appealing for students.
Original Materials Embedded Into the Resource.	1. Introductory presentation to welcome students to the virtual learning object. 2.Contents of the virtual learning object (infographics). 3. Presentation with the learning objectives (infographics). 4.Guidelines. 5.Tutorial on how to create a word cloud. 6.While reading activity of the first reading cycle (Infer the meaning of the vocabulary according to the text read) 7.After reading quiz game (first reading cycle)

	8.Odd one out activity placed in the “while reading” phase of the second reading cycle. 9.Reading comprehension activity of the after-reading phase 10.Reading comprehension quiz, in unit 2 11.Interactive presentation with the “before reading phase” in the last reading cycle. 12.“While reading” phase activity of the last reading cycle. 13. “After reading” phase activity of the last reading cycle. 14.Reading comprehension activity in the last reading cycle 15.Self-assessment activities in units 1, 2 and 3 16.Final task (Test)
External Materials Embedded Into the Resource.	1.Web page https://www.abcya.com/games/word_clouds as a warming up activity. 2. Picture took from GE *hired renowned comics artists*. Adventures in Science. 3.Excerpts taken from the book" Eureka! I've discovered Electricity! by Britt Norlander. 4. Charge it! curricular focus: Physical science-Text. 5. Informative posters took from the web page "very well health" and "Electrical Safety Foundation." 6. Electrical safety in the home (video)

VLO Link	https://sites.google.com/uptc.edu.co/electrifying-english/introduction?authuser=0

Action and Observation

This second and third part of the cycle led the researcher to take action on what was previously planned in the first part of the cycle, so it was here that it was implemented the VLO with the students. In these parts of the cycle the teacher- researcher also implemented some of the data collection tools (direct observation, field notes, online qualitative surveys and posttest) in order to further analyze the information collected.

Reflection

In the final part of the cycle, the researcher analyzed the data collection instruments and established some answers and results regarding the research question and the problematic situation, in order to formulate a new cycle.

This type of study, chosen by the researcher was totally related to the literature review and the theoretical framework proposed in this investigation since as affirms Miller,M et al.(2003, P.8) “both practice and theory could benefit from combining action and research”, which allowed the constructs and theories proposed in the foregoing chapter(which were previously analyzed by the researcher and linked to the problem studied in this research project) not to remain static on paper, but to come to life in practice and try to provide a favorable response to the problematic situation faced by this students population. Considering the above information Miller, M et al. (2003, P. 7) also states that “theory is really only useful insofar as it is put in the service of a practice focused on achieving positive social change.”

This study also followed the practical action research, which in words of Thanavathi C.(2017) “involves a small-scale research project, narrowly focuses on a specific problem or issue, and is undertaken by individual teachers or teams within a school or school district” with the purpose of solving it and improving the educational practice; he also states that in this action research’s method teacher–researchers choose the area of study, “determine data collection techniques, analyze and interpret data, and develop action plans”(2017,p.7).

Context of the Research

In the educative context where the observation process was carried out, a group of fourteen male students of the technology in industrial electricity program that took part of the second level of English showed low levels of reading comprehension skills; especially difficulties in making inferences in relation to the texts proposed in the synchronous classes, which in some cases is a consequence of the students' background, since they are adults who graduated from high school many years ago and after a long time, they restart their studies, so they are not used to reading, even less to reading in a foreign language. Likewise, in this same group of students, there were cases where despite being young they did not have the previous habit of reading in their schools or homes and were not used to drawing conclusions beyond the reading, which generated in them a certain predisposition and reticence to read in English, despite the fact that the texts presented in previous synchronous English classes were in accordance with their English level, which interrupted the process of their own learning of foreign languages. Due to the above, the participants showed an inferential reading deficiency in English and lack of reading comprehension skills that directly affected not only the interpretation of the information that they read, which may have future consequences in relation to their performance in English on the State of the Quality of Higher Education, Saber TyT but also in

the understanding of the target language they seek to learn and may truncate its direct relationship with reading. In words of (Koda, 2007, quoted in Gilakjani., A & Sabouri., N, 2016) "various variables that impact learners' reading comprehension. Some of these variables involve vocabulary knowledge, prior knowledge, metacognitive information, and reading strategies". In this sense, it should be noted that the first, second and the last variable were reviewed and strengthened in this study.

Population and Sampling Procedures (Participants)

Population. The total population under study corresponded to 100 students enrolled in the Technology in Industrial Electricity program at UPTC in the year 2023 II.

Sample. The sample for the development of the present study corresponded to 14 male students belonging to the faculty of Distance Studies of the UPTC in the Technology in industrial Electricity program which due to the distance nature of the program were recruited by the teacher-researcher through the Convenience Sampling, which is a "type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study"(Elker et al, 2016. P.2)

Confidentiality and Anonymity of Participants in This Study

According to Graham et al., (2013) and Shaw et al., (2011), both cited by Moscoso, L et al. (2018) "La confidencialidad incluye garantizar el anonimato y la imposibilidad de identificar a los participantes de la investigación en los informes, presentaciones y otros medios de difusión de los resultados". Bearing this in mind and with the intention of conducting a comprehensive and ethical investigation that would protect the identity of the research participants, they signed an informed consent form (Appendix A) to be part of the study in which they were informed of

the objective of the project, the data collection instruments, as well as the fact that the teacher-researcher would be the only one who would have access to the their data.

Regarding the ethical implications of this research, it is important to mentioned that at the moment of collecting and presenting the observed information and the results of the investigation, the student's data was presented in an anonymous way, so the teacher-researcher changed their names to letters of the alphabet that did not relate to the first or last names of the students but were randomly arranged, for instance student A, B or C. Likewise, it is essential to reaffirm that the participant's personal data was confidential so students who took the online qualitative surveys and the pre and posttest did it anonymously, omitting their names or using an alias or nickname.

Teacher's Role

The role of the teacher-researcher was to design the virtual learning object focused on electricity and to implement the reading comprehension strategies that allow the students to strengthen their inferential reading comprehension skills.

Data Collection Instruments

Considering the qualitative nature of this study, the instruments that the researcher implemented after having carried out the direct observation process were field notes, the online qualitative surveys and a pre and post-test in order to obtain a primary and qualitative information that could answer the research question, which in accordance with the type of study selected by the teacher -researcher were instruments that took into account the action cycle of planning, action, observation and reflection mentioned above. It is worth highlighting that the selection of the aforementioned data collection instruments was made based on the data collection instruments implemented in the study by Sanchéz & Silva (2023), Hernández, S

(2019), Banditvilai, C. (2020), Reigner & Monterrosa (2021), Araujo& Martínez (2022) and based on the criteria of the teacher-researcher.

Collection of Data/Gather Procedures

Direct Observation. According to Holmes (2013) direct observation, also known as observational study, is a method of collecting evaluative information in which the evaluator observes the subject in his or her usual environment without altering that environment.

This instrument was implemented in the research project to collect information about how the implementation of the VLO can strengthen the student's inferential reading comprehension skills, therefore, according to what the teacher researcher was noticing or observing in each of the sessions with the VLO, she was documenting this data in field notes, which will be discussed below.

Field Notes. According to Wood (2006) field notes can be described as observing a culture, setting, or social situation. Hecker and Kalpokas (n.d) complement this statement by asserting that "Field notes are the researcher's written record of observations made, experiences had, and insights gleaned while in the field conducting research". As was mentioned in the previous section, in this study the teacher-researcher used this tool to document what happened in each of the English virtual sessions using the VLO focused on electricity content, the participants' reactions and attitudes to these VLO sessions, the inferential reading comprehension strategies proposed and how those strategies could improve or not the participant's inferential reading comprehension skills. In the process of using this tool, the teacher-researcher made sure to write firsthand everything she could see, hear and perceive that occurred in each of the virtual sessions while the students were using the VLO, in addition to describing in a detailed way the development of the Virtual sessions, so these field notes were written in a chronological way. It

should be noted that since the virtual sessions with the VLO were conducted in English, but the researcher's mother tongue is Spanish, the field notes were taken in both languages. (See Appendix G)

Online Qualitative Surveys. According to Brown, V et al. (2021) qualitative surveys prioritize qualitative research values, and harness the rich potential of qualitative data, have "much to offer qualitative researchers, especially given online delivery options". Taking into account this information and considering that this research was carried out virtually, the students can answer some questions related to their relationship with reading after the study, their thoughts and experiences regarding the virtual learning object focused on electricity, the inferential reading strategies implemented there and if regarding their objective experience they consider that their inferential reading skills presented any change thanks to the implementation of the VLO in the virtual classroom.

Pre and Posttest. In words of Waltz (2023) while a pre-test is an assessment measure given to participants before they have undergone some type of treatment as part of a research study, a post test is defined as an assessment measure applied to the participants of a study after the study was completed. Taking into account that at the first quarter of the semester the students were given a pre-test designed by the teacher-researcher, where they were asked to read some texts in English (which are for public use and were taken from the web pages cited in the test document) and answer some proposed questions (in order to measure their inferential reading comprehension skills and the result of which was one of the factors for which this study was proposed as can be seen in figure 1 and table 1) the students took a post-test (see figure 22) after having finished the implementation of the VLO with the intention of measuring their inferential reading comprehension skills now that they knew the reading comprehension strategies taught in

the VLO and have carried out the activities proposed there. It is important to mention that in order to answer the research question, the data collected through the implementation of the above-mentioned data collection instruments was analyzed by means of a thematic analysis, which in words of Jason &Glenwick (2016) " is a method for analyzing qualitative data that involves searching for recurring ideas in a data set" and will be explained in more detail in the data analysis chapter.

Piloting and Validation

In words of Winter (2000) cited by Cohen et al (2007) in qualitative studies "validity might be addressed through the honesty, depth, richness and scope of the data achieved, the participants approached, the extent of triangulation and the disinterestedness or objectivity of the researcher", in that sense, piloting was implemented with a group of fourteen students of the Technology in industrial Electricity program of the UPTC with the purpose of determining the validity of the questions proposed in the pre-test, posttest and the virtual surveys that will be implemented later with the sample group. It is important to highlight that the students responded favorably to the pilot pre-test (which was carried out virtually) not having any concerns with the structure of the exam or the type of questions asked, however, it was necessary to make some modifications to the proposed surveys. Regarding the first pilot survey, it was composed by seven questions or variables, some of them were measured according to the Stevens classification (1951) with item scales, which in words of Padilla, L.(2021) "are very common in the practice of surveys and are constructed by means of a limited number of answers, which are shown by means of numbers or words, which generally mark a certain order or graduation" and the other ones with open-ended questions, which were not very successful since I could notice that this last type of questions is not flexible enough with the students and causes them to feel

overwhelmed by having too many questions where they must respond with their opinion in a foreign language, which had as a consequence that they did not answer them. Regarding the above, as adjustments to the first pilot survey, it can be evidenced a change in the type of questions, since more item type questions than open-ended questions are proposed. (See Appendix B: First pilot survey and figure 12)

Regarding the final pilot survey, it was composed by six questions or variables, most of which were designed with open-ended questions and item scales; however the first question was designed with numerical scales which according to the results of the survey did not allow pilot students to fully express their experience with the Virtual learning object and relationship with the proposed readings, so as an adjustment for the final survey this type of question was changed to an open-ended one(See figure 19 and Appendix C).

After allowing the pilot students to review the content of the VLO and express their opinions regarding the proposed lessons (which were favorable, since they indicated that the themes of the lessons catch their attention as well as the design of the VLO) they were proposed to conduct the pilot post-test (See Appendix D), in which they had to read the text taken from Amin, R. (2022) and answer the reading comprehension questions putting into practice the information reviewed in the VLO. According to the results of this pilot test, some adjustments were made to be implemented in the post-test conducted by the sample students; these adjustments were related to the format of the test, since thinking about the convenience of the student, it was originally done through Google forms, however some pilot students did not understand whether it was a survey or an exam and did not answer it, for that reason the teacher-researcher decided to change the format of the post-test to a traditional one designed in a word document.(See Figure 26-28)

VLO´s Pilot Section

In words of Corbin & Strauss, (2008) quoted by Hernández, S.(2017) "regardless how much teachers-designers revise the VLO, there are always small details to correct that the teacher could pass unnoticed"; in that sense with the intention of avoiding bias, validating that the content of the VLO was adequate to the objectives of the study and that it could be implemented later by the sample students, it was reviewed by three expert teachers who after analyzing it in detail and set some observations regarding the activities filled out a validation form, with which they endorse its realization (See Appendix E).Likewise, as stated above in order for this VLO to be considered valid, the piloting of the VLO was carried out with a group of 14 students (same group with which the previous pilots were implemented) of the Technology in Industrial Electricity Program of the UPTC, in two sessions, the first session of two hours and the second of one hour, where the observations and opinions of the pilot students regarding the VLO and the reading cycles were collected in the evaluation rubric below. It should be noted that since the program to which the students belong is virtual, the accompaniment of the students throughout the process was carried out by means of the Google meet tool.

Figure 8

VLO Assessment Rubric Filled Out by a Pilot Student

SECCIÓN PILOTAJE				
OBJETO VIRTUAL DE APRENDIZAJE ELECTRIFYING ENGLISH"				
	☑ Presente en el OVA.	☐ Por agregar	☒ No está presente en el OVA	
Criterio	**☑**	**☐**	**☒**	**Observations**
El objetivo del OVA es claro	x			El OVA está bien diseñado y los objetivos son claros

El OVA contiene instrucciones que permiten la adquisición de conocimientos y habilidades sean mucho más claras y efectivas para el estudiante.	x			Las instrucciones compartidas son totalmente claras
Las instrucciones permiten alcanzar los objetivos propuestos	x			Si
El contenido del OVA promueve un diálogo y comunicación constante entre la docente y el estudiante.	x			Si, hubo comunicación constante
El contenido del OVA satisfizo sus expectativas y necesidades como estudiante de Tecnología en Electricidad?	x			A pesar de que el objetivo del OVA es aprender inglés y mejorar nuestras habilidades de comprensión de lectura, sobre todo la lectura inferencial, los temas son muy interesantes y variados.

Los contenidos y actividades propuestas en el OVA favorecen el aprendizaje significativo	x			En el OVA se promueve el aprendizaje en todas las sesiones
Los recursos empleados en el OVA favorecen el objetivo principal del OVA?		x		Me gustaría que no solo fueran lecturas en inglés, sino también textos en otros formatos, como en posters o imágenes.
¿El OVA presenta espacios que alientan al estudiante a reflexionar sobre el contenido de aprendizaje y sobre su propio aprendizaje?	x			Si
¿Los tips o estrategias para mejorar la comprensión de lectura inferencial son entendibles?	x			Si, son muy claros y útiles.
¿Las actividades propuestas son apropiadas para los objetivos del OVA?	x			Si, las actividades son interesantes, entretenidas y ayudan a cumplir los objetivos

¿Las actividades propuestas en el OVA promueven el aprendizaje activo?				Si.
¿Las actividades son interactivas?	x			Si, se evidencia totalmente
El entorno de aprendizaje virtual cuenta con actividades de práctica para los estudiantes.	x			Si, en todos los ciclos de lectura
De acuerdo con los objetivos del OVA ¿considera que las actividades de evaluación son apropiadas?	x			Si, evalúan lo establecido en los objetivos al comienzo

After analyzing the students' responses to the evaluation rubric, it was necessary to make some adjustments to the VLO in terms of the implementation of different formats that would allow the student to read in English without necessarily being texts, because although they were texts related to the electricity content, the fact that they were texts that the students considered too long, could be a bit overwhelming and repetitive for them, so it was decided that in the reading cycles of the VLO the students would have an approach to reading in English not only through texts but also through posters, the analysis of comics and subtitled videos on electricity.

Regarding the activities proposed in the VLO, the pilot students considered that they were interactive and fulfilled the objective of the VLO, so no adjustments were made to them. Finally, regarding the inferential reading comprehension strategies proposed in each reading cycle of the VLO, the students considered them to be clear and useful, so they did not undergo any changes.

Pedagogical Intervention and Application (If Applicable)

Considering that the VLO was already validated, it was decided to implement it with the sample groups of students. This VLO was designed through the Online Google sites platform, a flexible and easy to navigate tool that being interconnected with other Google applications facilitates the incorporation of different resources such as YouTube videos, articles, documents exported from Google Drive, images, games, forms and interactive activities exported from tools such as Genially or H5P, which makes this resource very interactive and appealing for students; in that sense this VLO was given the name of "Electrifying English" because it is a resource based entirely on electricity content, which seeks to strengthen inferential reading comprehension skill in online English classes with sample students.

Taking into account that at the Faculty of Distance Learning classes are held one day a week every 15 days in the Technology in Industrial Electricity program, the researcher decided that the VLO would consist of three reading cycles called, in order of completion, History of Electricity, Clean Electricity and Care in the Use of Electricity; each of these reading cycles had a one-hour duration and based on the Solé's (1992)three-phase strategies (See table 3) were made up of before, during and after the reading activities (in addition to a previous knowledge activity and the further feedback of the reading cycles' activities) which were conducted in virtual synchronous English sessions accessed through Google meet (students had also free access to the VLO outside of class, which indicates that this resource can also be used

independently by students.).It should be noted that within the inferential reading activities and reading comprehension tips proposed in each reading cycles, the following reading strategies were implemented based on the Barret's Taxonomy's third level of Reading comprehension and the Solé´s (1992) reading strategies: Predicting outcomes, inferring main ideas from a text, inferring supporting details, infer the meaning of unknown words by using contextual clues, read aloud and extract the main and secondary ideas of the text, formulate hypotheses about what the reader will find in the text while reading it, clarify doubts from the information read by asking oneself questions and reading comprehension quizzes. Accordingly, the reading cycles were developed as follows:

Table 4

Reading Cycle One: History of Electricity

Reading Phase	Activity Proposed	Reading Comprehension Tip Proposed to the Students
Before Reading	The teacher -researcher asked the students to analyze a comic from an old magazine called “Adventures of electricity” took from *GE artists. Adventures* in Science. After analyzing the picture of the comic and the text that accompanies this picture, the teacher researcher asked the students what can they infer from the comic dialogue? In this reading phase the students were also allowed to reflect on the image they analyzed by asking them questions about the importance of the discovery of electricity for the human race, which prepared them for the next phase of the reading.	1.To make an inference keep in mind not only the clues or key words provided by the author in a text, but also the pictures that surround the text. They can also give an idea of what the text is about. 2. It is not necessary to know the meaning of all the words in a text to understand it. You can use the context clues found in a sentence or paragraph, to understand the meaning of a word that you don't know.
While Reading	With the teacher's help, the student read the proposed texts, which were some	The reading comprehension tips were proposed to the students before the reading,

	excerpts took from the book" Eureka! I've discovered Electricity! by Britt Norlander, about the history of electricity. As a "while reading" activity, students tried to infer the meaning of some unknown words related to electricity (which were words found in the texts), for which they can use contextual clues found in the reading and the images that preceded them.	so they could put them into practice when reading.
After the Reading	After the “while reading activity” the students took a short reading comprehension quiz regarding the texts read in this session, where they were asked to make some inferences. finally, they perform a self-assessment activity to test their knowledge of unit 1.	The reading comprehension tips were proposed to the students before the reading, so they could put them into practice when reading.

Note. Each reading cycle had one hour duration

Table 5

Reading Cycle Two: Clean Electricity

Reading Phase	Activity Proposed	Reading Comprehension Tip Proposed to the Students
Before Reading	The teacher-researcher asked the students to analyze a picture related to climate change and renewable energies, then they were asked to make predictions regarding what they would find in the text.	1. To make an inference you must ask questions to yourself in relation to the text you have read, this will help you to monitor your own reading comprehension and show whether or not you have really understood the text. 2. Make a list of the most important details in the text, then ask yourself what the author meant by it and if there might be any ideas that the author is not saying literally in the text.
While Reading	Students were asked to read a text related to how electricity works. As a "while reading" activity, students had to select which words did not correspond to the vocabulary related to the text read, that is, which words were not related to electricity or renewable energies, for which the students had to put into practice the reading strategies learned in this second reading cycle.	The reading comprehension tips were proposed to the students before the reading, so they could put them into practice when reading.

After the Reading	Finally, as after-reading activities, the students carried out some exercises that tested their inferential reading comprehension and a reading comprehension quiz. Finally, they perform a self-assessment activity to test their knowledge of unit 2.	The reading comprehension tips were proposed to the students before the reading, so they could put them into practice when reading.

Note. Each reading cycle had one hour duration

Table 6

Reading Cycle Three: Care in the Use of Electricity

Reading Phase	Activity Proposed	Reading Comprehension Tip Proposed to the Students
Before Reading	The teacher-researcher asked the students to analyze and make inferences about the picture related to the bad use of electricity, then they were asked to make predictions regarding what they would find in the text.	1. It is important to contrast the clues or information that the author of a text gives to you with your own previous experiences to make an inference.
While Reading	Students were asked to read information presented on posters related to the safe use of electricity at home took from the web page "very well health" and "Electrical Safety Foundation". To complement this information, they were asked to watch the video Electrical safety in the home with English subtitles. Then, as a “while reading activity” students had to infer and choose the pictures that had relation to a risk of the use of electricity.	The reading comprehension tips were proposed to the students before the reading, so they could put them into practice when reading.

After the Reading	As “after the reading” activity the students answered a short questionnaire where they had to infer the main idea of the posters and the video and do a small reading comprehension game to verify their understanding of the information presented in the posters and the video. As a final task of this third cycle, the students took a post-test in which they read the text “Electrical safety FAQ” taken from Amin, R. (2022) and put into practice the inferential reading strategies learned to answer the questions posed, then they perform a self-assessment activity to test their knowledge of unit 3.	The reading comprehension tips were proposed to the students before the reading, so they could put them into practice when reading.

Note. Each reading cycle had one hour duration

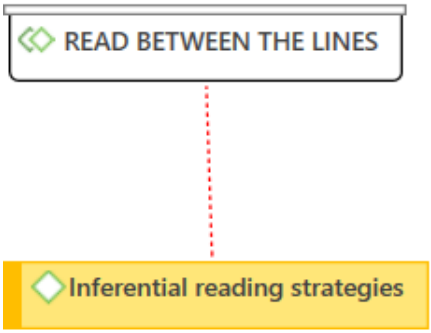
Data Analysis

Introduction to Data Analysis

For the analysis of the data, the researcher followed the steps proposed by the Thematic analysis that according to Braun & Clarke (2006) cited by Maguire & Delahunt (2017) "is the process of identifying patterns or themes within qualitative data" with the objective of interpret and use these themes or patterns found to say something about an issue. Taking into account the above information, in this study the teacher- researcher coded the collected information related to the implementation of the VLO focused on Electricity in the English virtual classes and then she organized those information into themes that expressed specific information about the research question; the above with the help of the Atlas.ti qualitative analysis tool, which is an "essential tool that facilitates researchers' ability to undertake well-organized, systematic, effective and efficient data analysis in many studies" (Rambaree, K. (n.d) as cited in Lewis, 2004; Lu &Shulman, 2008; Konopásek, 2008; Friese, 2012; Rambaree & Faxelid, 2013), which can be seen in the coding graphics and the table below.

Figure 9

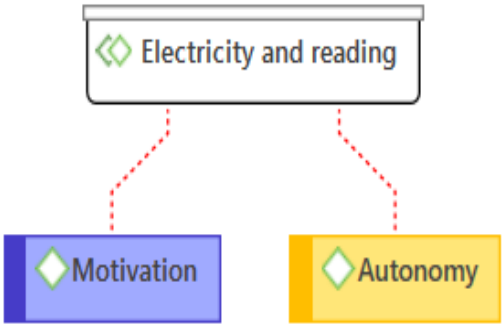
Read Between the Lines



Note. Graphic took from the Atlas.ti analysis.

Figure 10

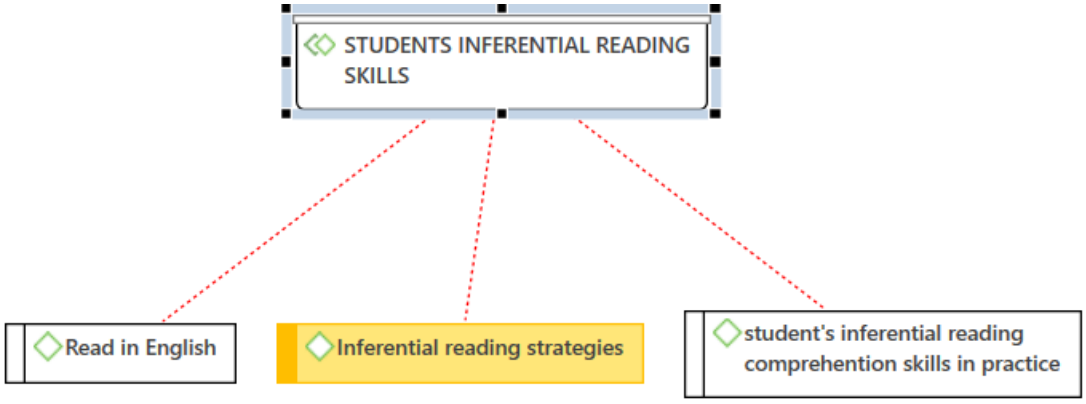
Electricity and Reading



Note. Graphic took from the Atlas.ti analysis.

Figure 11

Students 'Inferential Reading Skills



Note. Graphic took from the Atlas.ti analysis.

Table 7

Themes and Codes

Research Question	
How the design and development of a Virtual Learning Object (VLO) based on electricity content can strengthen the inferential reading comprehension skill in online English classes of a group of undergraduate distance students of the UPTC?	
Themes	Codes
Read between the Lines	VLO Inferential reading strategies.
Electricity and Reading	Motivation and Autonomy.
Students' inferential reading skills	From the VLO to the practice

Note. Table design taken from Glazzard and Stones (2019*)*

Read Between the Lines

The first theme is called Read between the lines because the codes organized in this section were related to the inferential reading comprehension strategies proposed in each one of the VLO reading cycles and the way how those strategies proposed there impacted the inferential reading comprehension of the students, as follows:

Table 8

VLO Inferential Reading Strategies

Reading Cycle	Reading Comprehension Tip	Tip Impact on Student's Inferential Reading Comprehension Skills
History of Electricity (Reading Cycle 1)	No tip in this note	"En el primer ciclo de lectura se socializaron las nubes de palabras diseñadas por los estudiantes y se realizo el ejercicio de lectura relacionado con la historia de la electricidad.Los estudiantes tambien

		realizarón los ejercicios de comprension de lectura y pusieron en practica los tips de lectrua inferencial propuestos en esta sesion con el Objeto Virtual de aprendizaje". [Note took from the field notes, first session with the VLO]
History of Electricity (Reading Cycle 1)	The images accompanying the text are a support to make an inference. (Reading cycle 1)	"Las imágenes que los estudiantes relacionan con el texto les ayudan a hacer inferencias". [Note took from the field notes, first session with the VLO] "Antes de leer el texto las imágenes le ayudan a uno a asociar lo que significa el texto y lo que de pronto el autor quiere decir"Student C. [Note took from the field notes, first session with the VLO] Likewise, in the survey that the students developed at the end of the reading cycles, to the question asked in Spanish*:* "De los tips o estrategias de lectura propuestas en el objeto virtual de aprendizaje ¿Cuál considera usted que le es de mas ayuda al momento de leer en inglés e inferir la

		información que no es tan evidente en el texto? 46.7% of the students mentioned the strategy: Las imágenes ayudan a inferir la información del texto" [Note took from the student responses to the latest survey]
Clean Electricity (Reading Cycle 2)	The images accompanying the text are a support to make an inference. (Reading cycle 1)	"Teacher I ¿Cómo se dice relacionar en inglés? the picture of the earth with the topic of clean energies" Student A. [Note took from field notes]
History of Electricity (Reading Cycle 1)	It is not necessary to know the meaning of all the words in a text to understand it, you can also detect the key words to infer its meaning.	"Identificando las palabras claves en el texto me ayudan a inferir las palabras desconcidas y inferir lo que el personaje histórico hizo". Student B. [Note took from the online English classes field notes]
History of Electricity (Reading Cycle 1)	It is not necessary to know the meaning of all the words in a text to understand it, you can also detect the key words to infer its meaning.	"Yo no sabía que uno podía comprender la idea central de un texto sin conocer lo que significaba palabra por palabra" Student c. [Note took from the field notes] In the survey that the students developed at the end of the reading

	It is not necessary to know the meaning of all the words in a text to understand it, you can also detect the key words to infer its meaning	cycles, to the question asked in Spanish*:* "De los tips o estrategias de lectura propuestas en el objeto virtual de aprendizaje ¿Cuál considera usted que le es de mas ayuda al momento de leer en inglés e inferir la información que no es tan evidente en el texto? 26,7% of the students mentioned the strategy : No es necesario saber el significado de todas las palabras del texto el mismo contexto de la oración, párrafo o texto pueden ayudar a inferir el significado de la palabra" [Note took from the student responses to the latest survey]
Clean Electricity (Reading Cycle 2)	To make an inference you must ask questions to yourself in relation to the text you have read, this will help you to monitor your own reading comprehension and show whether or not you have really understood the text.	"I could observe that thanks to the second cycle reading strategy students did a better job on the reading comprehension activities, however, my appreciations do not apply to all students, since in the second reading cycle student D told me that he preferred the tips proposed in the previous class, since with those he could better infer the meaning of unknown words". [Note took from the field notes, second session with the VLO]

Clean Electricity (Reading Cycle 2)	Make a list of the most important details in the text, then ask yourself what the author meant by it and if there might be any ideas that the author is not saying literally in the text.	"Profe a mi me gusta mas el tip de las palabras clave, con este uno se demora mucho" Student E. [Note took from the field notes, second session with the VLO]
Clean Electricity (Reading cycle 2)	To make an inference you must ask questions to yourself in relation to the text you have read, this will help you to monitor your own reading comprehension and show whether or not you have really understood the text.	"Profe mire que hice lo de hacerce preguntas a uno mismo sobre lo que uno leyó en la clase de metodos de estudio y entendi mejor el texto"Student D [Note took from the field notes]
Care in the Use of Electricity (Reading Cycle 3)	Contrast the clues or information that the author of a text gives to you with your own previous experiences to make an inference.	"Students performed better in the reading comprehension exercises when using the strategy of contrasting information from the text with previous experiences." [Note took from the field notes]
Care in the Use of Electricity (Reading Cycle 3)	Contrast the clues or information that the author of a text gives to you with your own	"Teacher this text -how do you say me recordo?- That I always take a shower with my cellphone, so this help me to select the correct option

	previous experiences to make an inference.	of the activity" Student A [Note took from the field notes]
Care in the Use of Electricity (Reading Cycle 3)	Contrast the clues or information that the author of a text gives to you with your own previous experiences to make an inference.	"Teacher it is important to check the house…mmm don´t let the charger all the time… conectado" Student B [Note took from the Field notes]
Clean Electricity (Reading Cycle 2)	It is not necessary to know the meaning of all the words in a text to understand it, you can also detect the key words to infer its meaning. Contrast the clues or information that the author of a text gives to you with your own previous experiences to make an inference.	"Profe cuando yo lei el texto implementé sobre todo los tips de la clase pasada para comprender el texto, no use el diccionario pero deduje el significado de las palabras que de pronto no sabia en inglés con las palabras siguientes en texto…las que si conocia… y tambíen como el texto era de un tema que vivo a diario pude relacionar la palabra con lo que veo en el trabajo". Student D [Note took from the Field notes]

Clean Electricity (Reading Cycle 2)	It is not necessary to know the meaning of all the words in a text to understand it, you can also detect the key words to infer its meaning.	“Profe yo me sentí comodo leyendo y si he sentido que he mejorado la comprension de lectrua en inglés, porque uno se va acostumbrando a leer en inglés, va leyendo mas decorrido, atando cabos y comprendiendo el vocabulario sin la necesidad de buscar en el diccionario o en el traductor todo el tiempo.” Student A [Note took from the field notes]

According to the information presented in the table and the graphics above it could be evidenced as a constant that even though sometimes the students found one reading cycle more appealing than another (due to the varied topics of each reading cycle related to electricity) they paid attention to the reading comprehension tips and implemented them, which was reflected in the performance of the reading comprehension activities developed after reading, specially the strategies in which the images of the text allow them to make inferences, the one in which it is possible to determine the meaning of unknown words through contextual analysis of the text and the strategy where they contrast the information in the text with their previous experiences to make an inference. Likewise, it could be appreciated thanks to the analysis of this information that the inferential reading comprehension tips or strategies proposed in the VLO can be used transversally in other subjects where students have an approach to texts to improve their reading comprehension of them. It should also be noted that not all tips work in the same way for all

students, so it is mandatory that in the process they identify the tip that best suits their type of learning.

Electricity and Reading

Motivation. According to Mila,E.(2018) who in her work exposes the Victor Vroom model of motivation states “Las personas se motivan a realizar cosas y esforzarse por lograr un alto desempeño para alcanzar una meta si creen en su valor, si están seguras de que lo que harán contribuirá a lograrla y si saben que una vez que alcancen la meta recibirán una recompensa, de tal manera que el esfuerzo realizado ha valido la pena”; taking into account the information exposed in the previous quote, participants of this study were attracted and motivated by the central theme of the virtual learning object, which led them to be more receptive when reading in English and doing the reading comprehension activities proposed in the virtual learning object. In that sense considering the information took from the field notes, when performing the reading comprehension activities proposed in each one of the reading cycles the students mentioned the following: “Profe bastante interesante y novedosa la forma para practicar la lectura en inglés, porque como es del tema de electricidad uno lo siente cercano y hace que le llame la atención aprender el idioma” (Student A, 2023), “Profe a mí me gusto la clase de hoy de lo de la electricidad, uno pone más atención con los temas que le gustan” (Student B, 2023), “Esta clase de hoy me recordó porque me gusta la electricidad” (Student D, 2023).

A student also affirmed that:

> Profe a mí no me gustaba el inglés porque a uno le ponían textos que no se sentían reales o que le fueran a servir a uno, y pues no era practico…pero ahora si me gusta…aunque uno no comprende todas las palabras del texto las puede deducir por el contexto y si no pues ya se buscan en el diccionario. (Student C, 2023)

Likewise, in the field notes taken by the teacher-researcher in the third reading cycle it was possible to note that the information presented in the posters was not known to the students, so it caught their attention and enhance them to read the purposed reading; in accordance with the foregoing the data presented in the motivation code allowed the teacher-researcher to perceive and reaffirm the importance of knowing students' contexts and their tastes at the moment of designing or using digital resources with them, since it managed to attract their attention, allowing them to feel comfortable and in this case since the VLO was related to electricity content, to approach the readings in English, since they were doing it around a topic they knew, that interested them and about which they wanted to know more.

Autonomy. Through this code it is intended to expose how the study participants began to search on their own for texts in English related to the topic of electricity, that their classmates could read and can share in class and read a book suggested by the teacher which can be seen in the following chart:

Table 9

Evidence of Student's Autonomy

Reading Cycle	Collected Data Linked to Autonomy
Care in the Use of Electricity (Reading Cycle 3)	"Some students started to look for information (mainly videos) related to the topic of the correct use of electricity at home outside the synchronous classroom and shared it on the WhatsApp group of the course". [Note took from the field notes and the direct observation]
Care in the Use of Electricity (Reading Cycle 3)	"Profe no se si a sumercé y a mis compañeros les interese, yo encontré una página con más términos de electricidad en inglés… es como un diccionario… ¿Se las puedo compartir si quieren?" Student A. [Note took from the researcher direct observation and field notes]
Clean Electricity (Reading Cycle 2)	"At the end of the second reading cycle class with the VLO, the student C asked in spanish: Teacher yo encontré un video de un señor en inglés que mientras hacía experimentos hablaba de la historia de la electricidad ¿ se lo puedo compartir a mis compañeros por el grupo?" (Note took from the field notes]
History of Electricity (Reading cycle 1)	"Teacher I am reading the book that you…how do you say sugirió? - the book of the history of electricity. I like it because…
Clean Electricity	has experiments. ¿Puedo decirlo en español?

(Reading Cycle 2)	Las palabras que no entendí las inferí con los tips y las que no pues las busqué en el diccionario.” Student D. [Note took from the field notes]

According to the results observed in this code it could be evidenced that even though it was found that the topic of the reading cycle determines the motivation of the students to read and watch the recommended videos proposed in the VLO, there were also cases where the students themselves put into practice the reading comprehension tips to improve the inferential reading comprehension skill, read by themselves another books in English related to electricity and look for extra information to continue contributing to their learning of foreign languages and their knowledge of electricity.

Students Inferential Reading Skills

From the VLO To the Practice. This code has this name because it exposes the results of the first and last survey developed by the participants, where they answered questions about the perception, they had in relation to their level of inferential reading comprehension before and after having participated in the VLO reading cycles as can be seen bellow:

Figure 12

First Survey

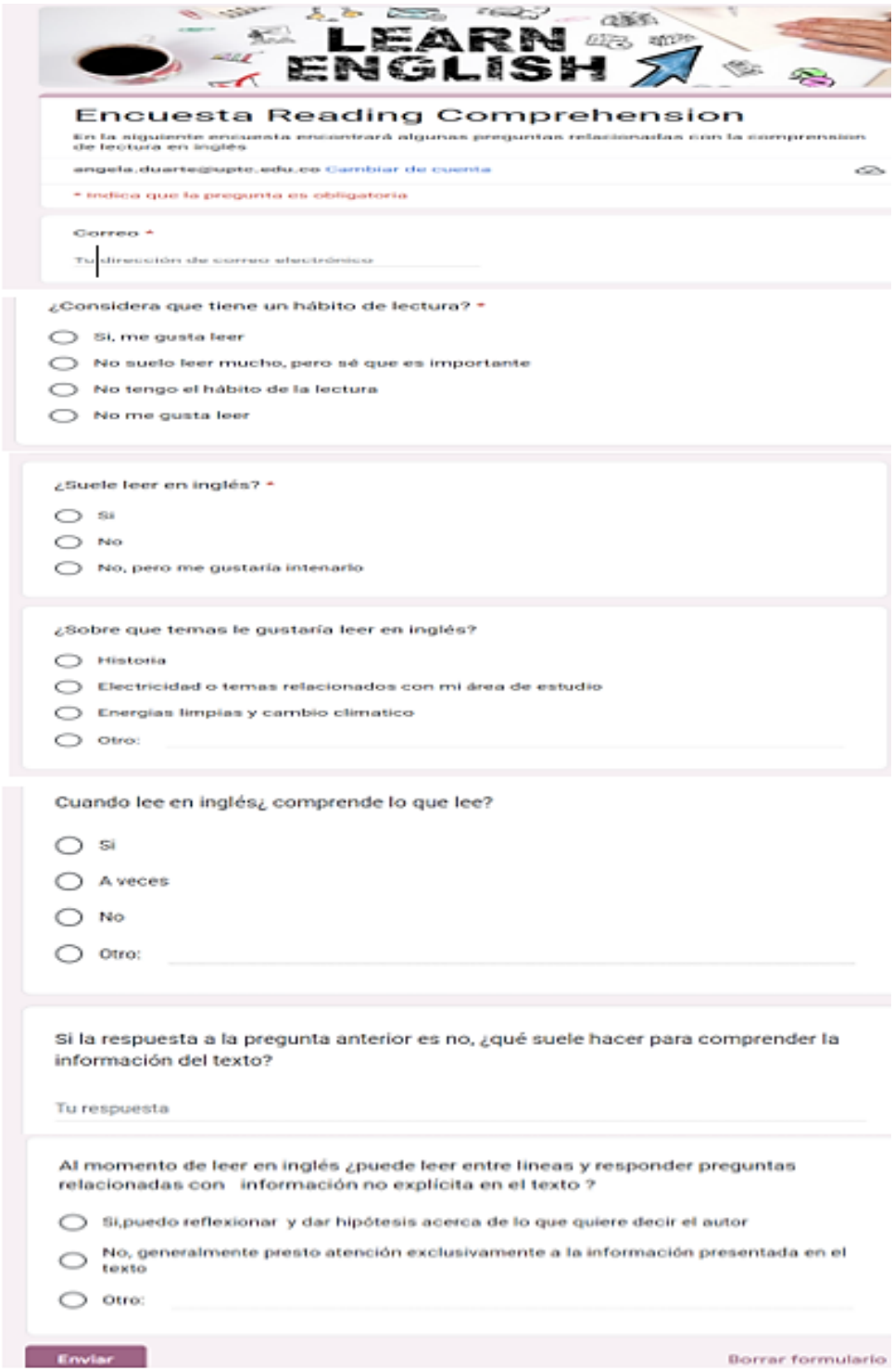


Figure 13

Percentage of Responses to Question 1 of the Survey

Figure 14

Percentage of Responses to Question 2 of the Survey

Figure 15

Percentage of Responses to Question 3 of the Survey

Figure 16

Percentage of Responses to Question 4 of the Survey

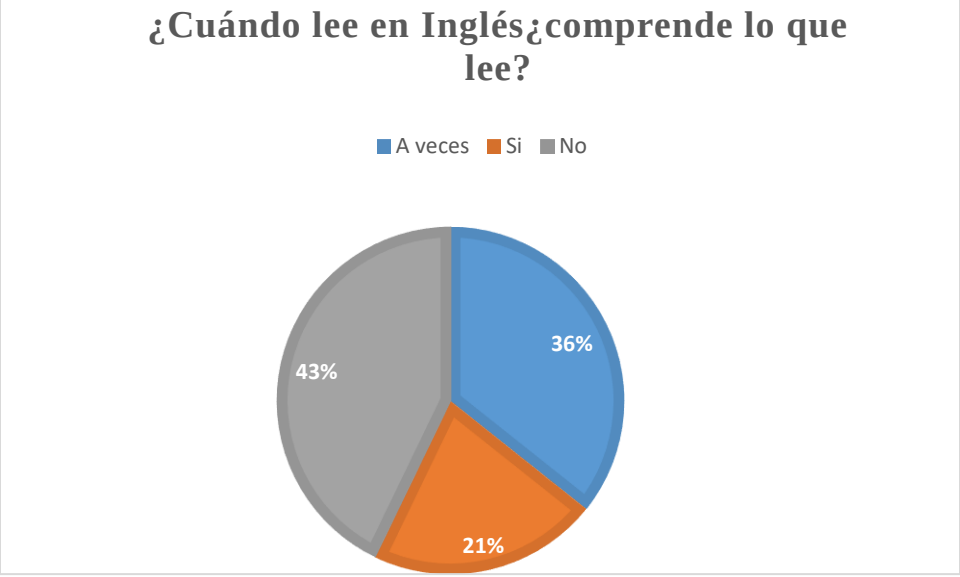


Figure 17

Percentage of Responses to Question 5 of the Survey

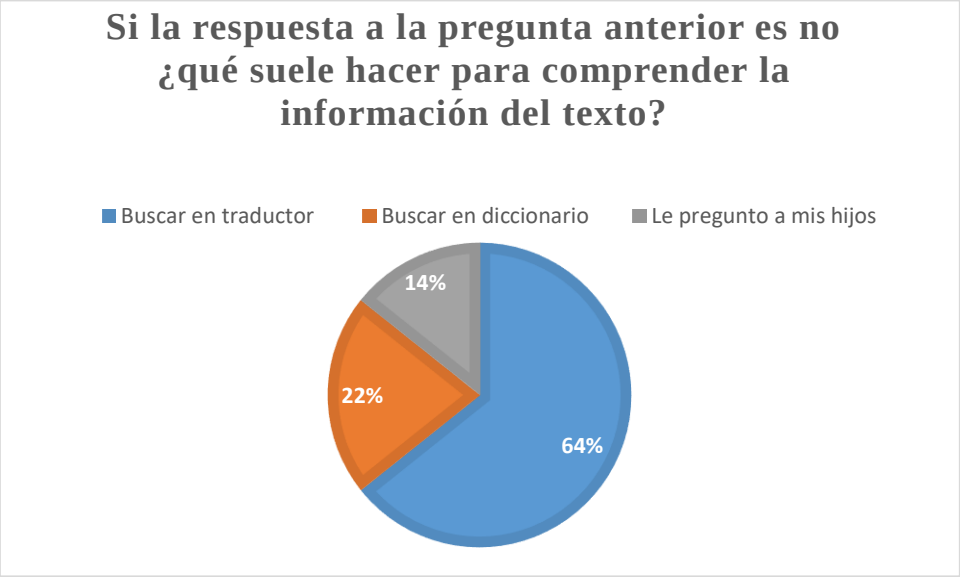


Figure 18

Percentage of Responses to Question 6 of the Survey

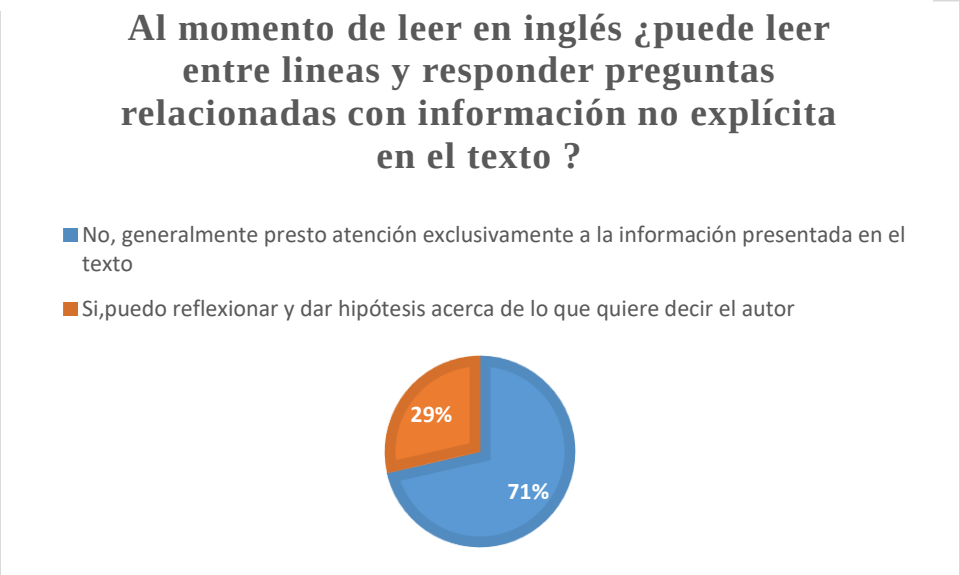
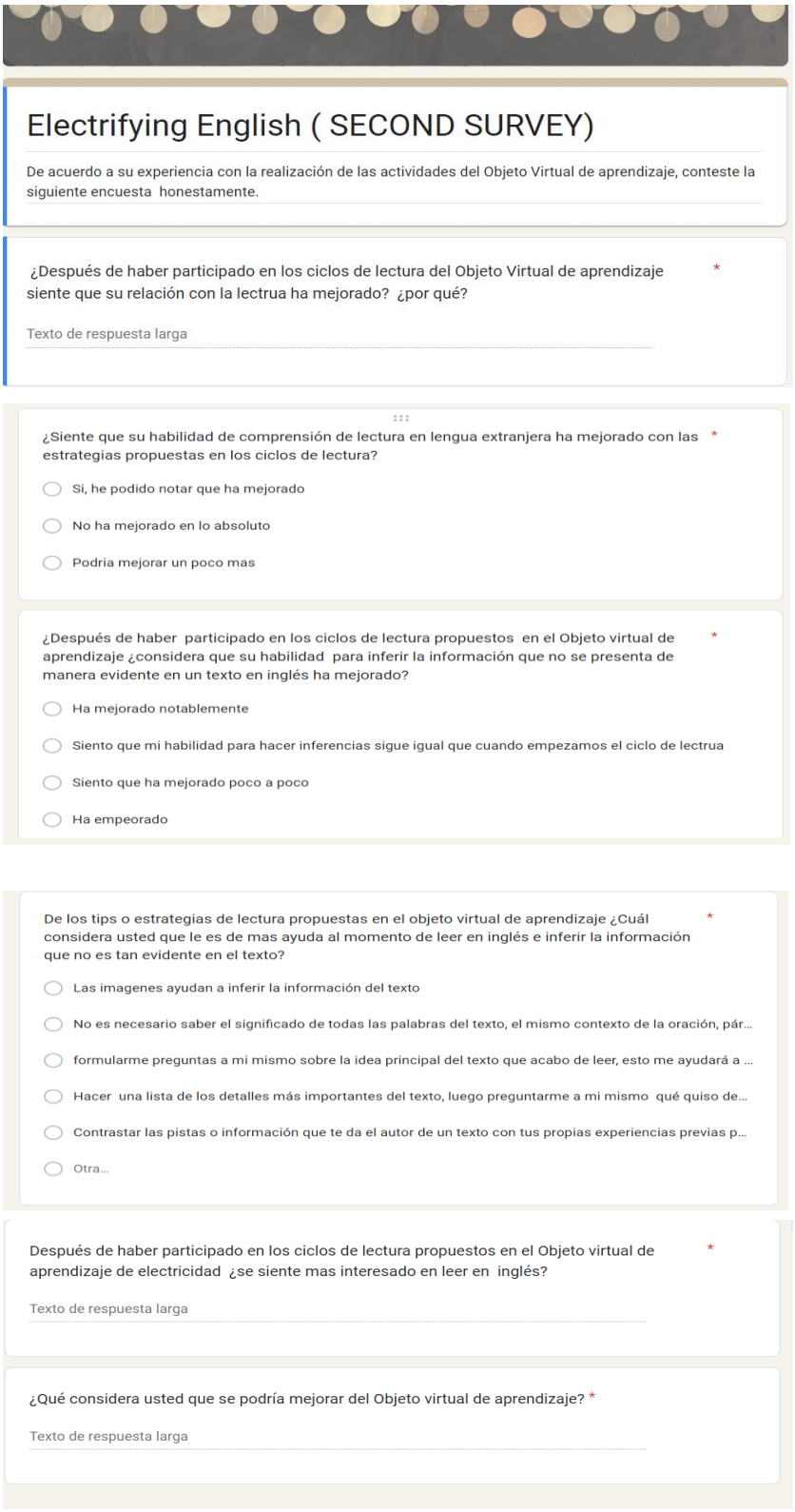


Figure 19

Last Survey



Electrifying English (SECOND SURVEY)

De acuerdo a su experiencia con la realización de las actividades del Objeto Virtual de aprendizaje, conteste la siguiente encuesta honestamente.

¿Después de haber participado en los ciclos de lectura del Objeto Virtual de aprendizaje siente que su relación con la lectrua ha mejorado? ¿por qué? *

Texto de respuesta larga

¿Siente que su habilidad de comprensión de lectura en lengua extranjera ha mejorado con las estrategias propuestas en los ciclos de lectura? *

- Si, he podido notar que ha mejorado
- No ha mejorado en lo absoluto
- Podria mejorar un poco mas

¿Después de haber participado en los ciclos de lectura propuestos en el Objeto virtual de aprendizaje ¿considera que su habilidad para inferir la información que no se presenta de manera evidente en un texto en inglés ha mejorado? *

- Ha mejorado notablemente
- Siento que mi habilidad para hacer inferencias sigue igual que cuando empezamos el ciclo de lectrua
- Siento que ha mejorado poco a poco
- Ha empeorado

De los tips o estrategias de lectura propuestas en el objeto virtual de aprendizaje ¿Cuál considera usted que le es de mas ayuda al momento de leer en inglés e inferir la información que no es tan evidente en el texto? *

- Las imagenes ayudan a inferir la información del texto
- No es necesario saber el significado de todas las palabras del texto, el mismo contexto de la oración, pár...
- formularme preguntas a mi mismo sobre la idea principal del texto que acabo de leer, esto me ayudará a ...
- Hacer una lista de los detalles más importantes del texto, luego preguntarme a mi mismo qué quiso de...
- Contrastar las pistas o información que te da el autor de un texto con tus propias experiencias previas p...
- Otra...

Después de haber participado en los ciclos de lectura propuestos en el Objeto virtual de aprendizaje de electricidad ¿se siente mas interesado en leer en inglés? *

Texto de respuesta larga

¿Qué considera usted que se podría mejorar del Objeto virtual de aprendizaje? *

Texto de respuesta larga

Figure 20

Percentage of Responses to Question 1 of the Last Survey

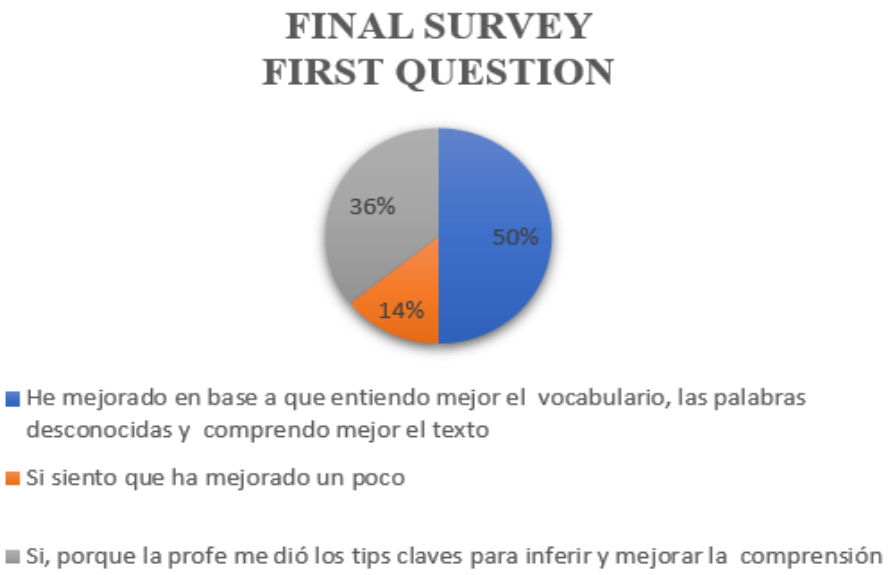


Figure 21

Percentage of Responses to Question 2 of the Last Survey

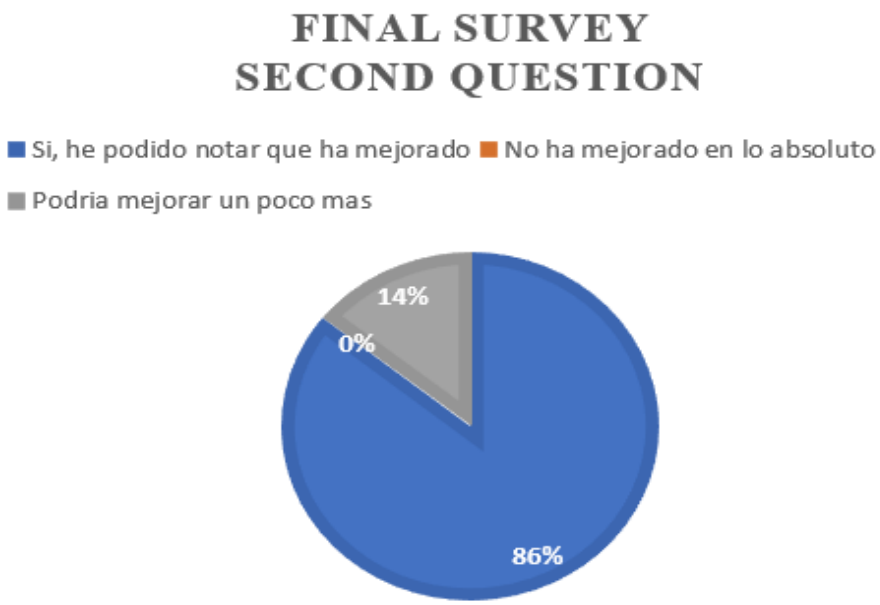


Figure 22

Percentage of Responses to Question 3 of the Last Survey

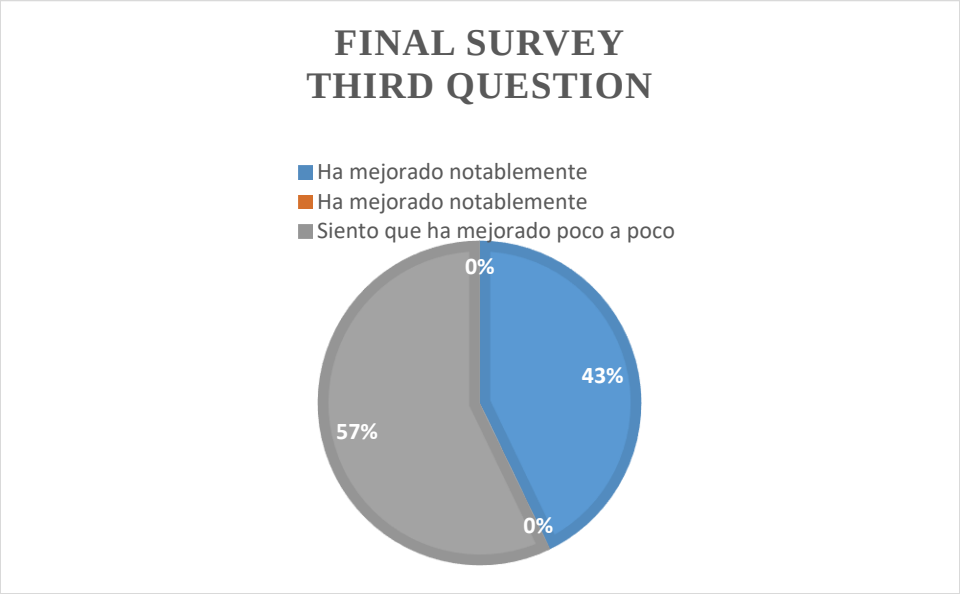


Figure 23

Percentage of Responses to Question 4 of the Last Survey

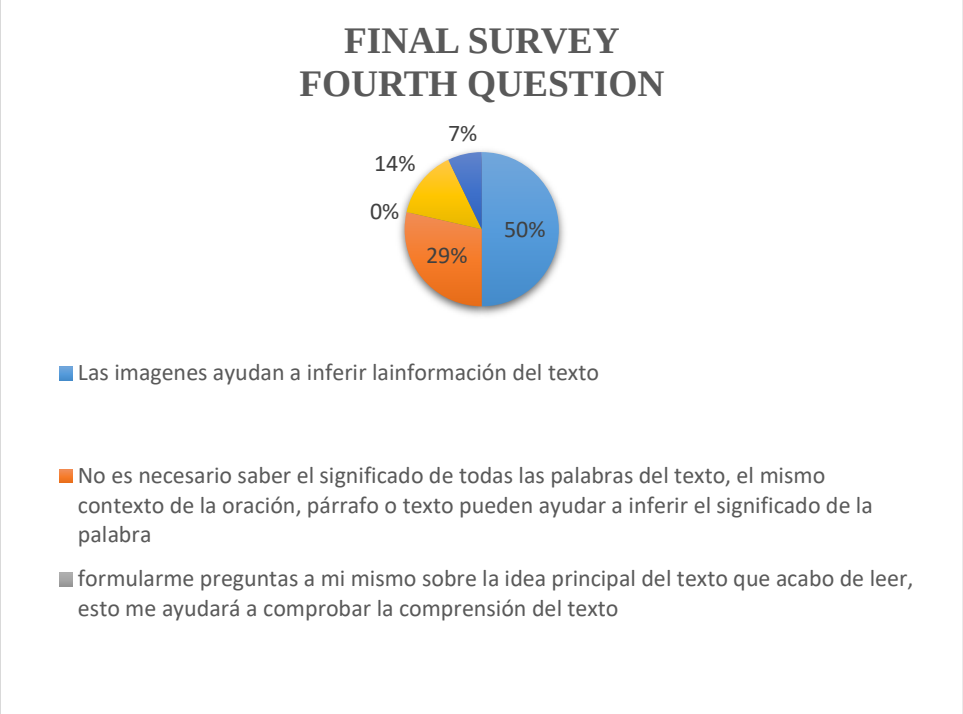


Figure 24

Percentage of Responses to Question 5 of the Last Survey

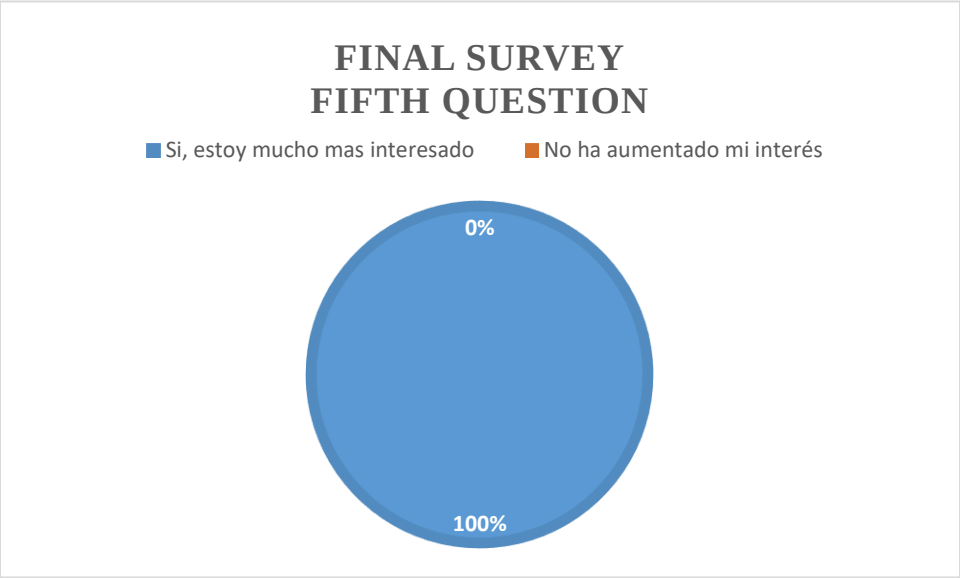
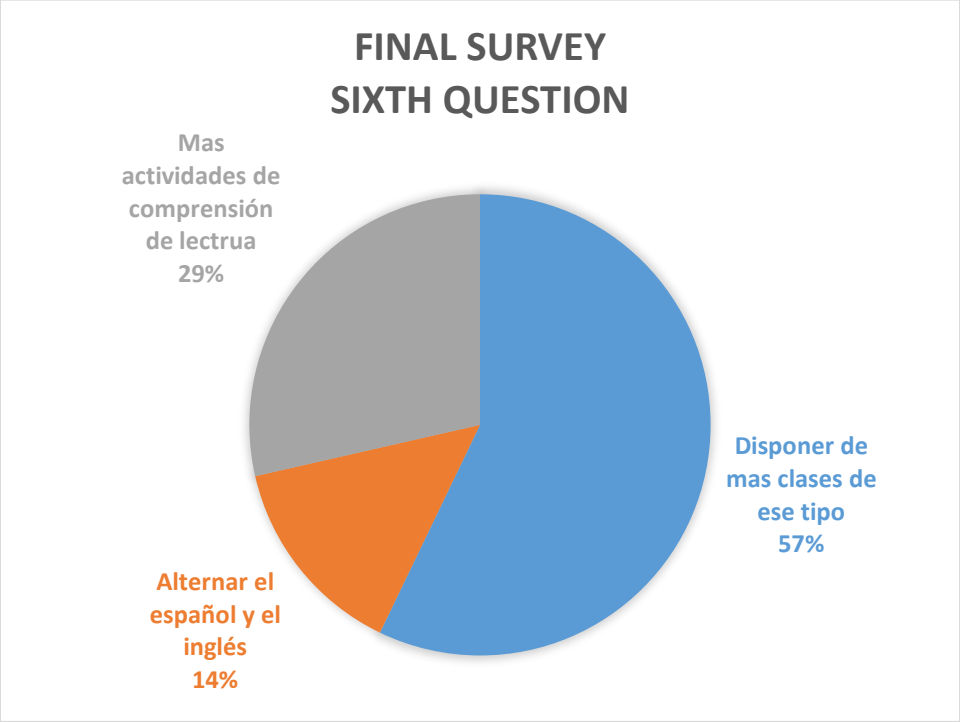


Figure 25

Percentage of Responses to Question 6 of the Last Survey



According to the surveys and figures above, it could be evidenced a participant's increase in the interest in reading in English and the relationship with reading, as well as a perception of a progressive increase in the reading comprehension and in the level of inferential reading by implementing the strategies proposed in the reading cycles of the VLO, specially the strategies of using the text guide images to make predictions and inferences of the information of the text and analyze the context of the text, paragraph or sentence to infer the meaning of unknown words rather than search them in the dictionary or Google translator.

The above information was compared with the results obtained in the first and last test given to the students before the implementation of the VLO and at the end of the last reading cycle in the VLO where they put the inferential reading comprehension strategies into practice. To see the first test, its results and respective percentages go to Figure 1 and Table 1. The following figures correspond to the test developed after the VLO and the students 'respective results.

Figure 26

Last Test Page One

IDIOMA EXTRANJERO II

TECNOLOGÍA EN ELECTRICIDAD INDUSTRIAL

FINAL TEST

Name: _____ **Date**_____

1. Read the following text took from Amin, R. (2022) and answer the questions, putting in practice the inferential reading comprehension tips learned in the Virtual Learning Object

Electricity Safety FAQ

What is electricity explain?

Electricity is a form of energy. Electricity is the flow of electrons. All matter is made up of atoms, There aretwo kinds of electricity – static (stationary) and dynamic (moving). In order for electricity to work it must have a continuous loop from its source through the conductor and back to the source.

What are 5 electrical safety tips?

5 electrical safety tips you should know

1. Ensure that all electrical appliances, cords and fixtures carry ISI mark
2. Keep all electrically powered appliances and equipment dry and away from places where water is used.
3. Unplug electrical appliances when not in use.
4. Turn off electrical equipment while leaving the place.
5. Don't overload circuits. Install additional circuits if needed

What are the 3 hazards of electricity?

The main hazards with electricity are:
1. Electrical shock
2. Burns
3. Electrical fire & Explosion

What are some electrical safety rules?

8 Safety Precautions Every Electrician Should Know –

1. Make sure your electrical equipment is maintained properly. Regularly inspect tools, cords, grounds, and accessories. Make repairs only if you are authorized to do so. Otherwise, arrange to have equipment repairedor replaced immediately.

*Note.*The reading proposed in the first two pages of the last Test was taken from the text called *Electrical Safety*.By Amin,R.2020,

https://www.researchgate.net/publication/365418972_Electrical_Safety

Figure 27

Last Test Page Two

2. Make sure you use safely features like three-prong plugs, double-insulated tools, and safety switches.

Besure machine guards are in place and that you always follow proper procedures.

3. Call electrician to carry out electrical repairs and lay wiring. (Only allow competent and

qualifiedelectrician)

4. Cover all unused electrical outlets

5. Avoid use of electrical extension cords. If their use is necessary ensure that they are of correct rating

andnot run through doors, walls, floors or any other location where they could be damaged.

6. Never use worn, frayed or damaged cords or appliances.

7. Follow correct specifications when replacing electrical fuses

8. Keep electric cables and cords clean and free from kinks. Never carry equipment by its cords.

Knowledge is a Commodity to be shared, Share this article to help others.

Thanking
Md Ruhul Amin Niloy
B.Sc in EEE (SEU)
mdruhulamin.niloy@gmail.com
Dhaka, Bangladesh

Question 1

After reading the text, to which population do you think this text is addressed?

A. Kindergarten Children

B. People who like camping

C. People with knowledge of electricity / the general public who want to know about the good use of electricity.

Question 2

Why do you think the author published this type of text?

Figure 28

Last Test Page Three

Question 3

Make the following prediction: what can happen if an electrical equipment is in contact with water?

Question 4

What does the author mean when he says, “make repairs only if you are authorized to do so"?

Question 5

What do you think is the main idea of the text?

Question 6

According to the author and your previous knowledge, what do you think you should do to avoid an electric shock?

Figure 29

Diagram of Final Test Results

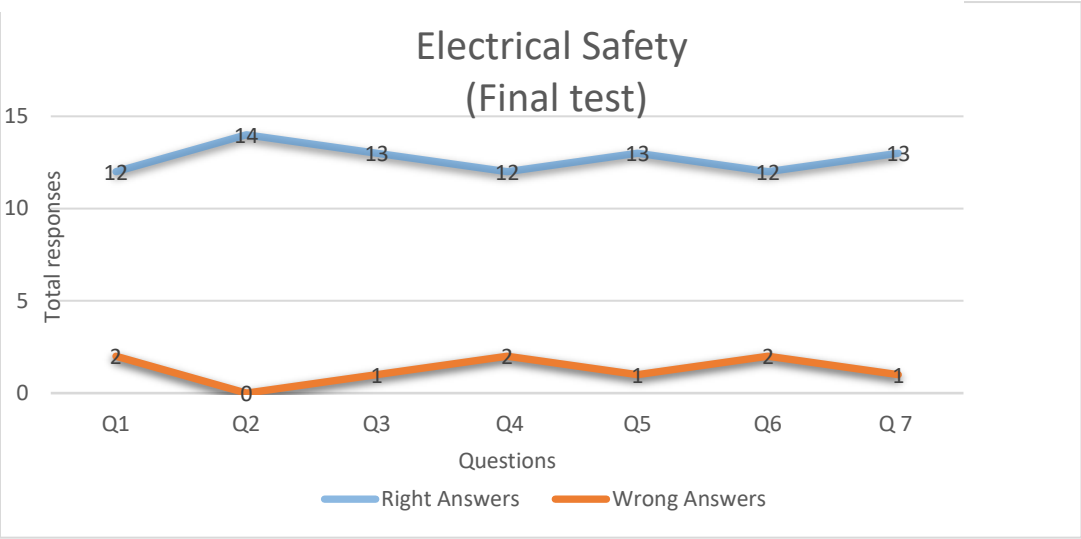


Figure 30

Final Test Results

Percentage of students who passed and failed the exam taken					
Number of students	Student's who approved the exam	Student's who failed the exam	Percentage of students who approved the exam	Percentage of students who failed the exam	Total
14	12	2	85.7	14.3	100.0

According to the results of the final exam compared to those of the first exam taken by the students, there was an increase in the number of students who approved the exam, with 42,9% of the students approving the exam on the first occasion, which increased notably to 85,7% on the second occasion, which shows that students' perception of the increase in their inferential reading comprehension ability is perceptible.

Results

This chapter illustrates the results obtained after analyzing the information of the codes and themes in respect to the research question and objectives proposed in the current qualitative research; regarding the research question: How the design and development of a Virtual Learning Object (VLO) based on electricity content can strengthen the inferential reading comprehension skill in online English classes of a group of undergraduate distance students of the UPTC? It is important to mention that since there is not much research related to the topic of the present one, this study will greatly help future teachers and researchers who wish to delve deeper into the design and implementation of a VLO for the purpose of improving inferential reading comprehension skill in an English distance learning context, which contributes greatly to the academic community; that said it can be seen that each of the different tips or inferential reading comprehension strategies suggested in the reading cycles of the VLO allowed the distance learners to gradually improve their inferential reading comprehension skills, however, as observed in the previous chapter, it is evident that not all strategies favored all students' inferential reading comprehension; their implementation and success depended on the student himself, his type of learning and context, therefore, it is mandatory that the student analyzes the strategies proposed in the VLO to identify those that best suit him or her and allow the inferential reading comprehension of the text. It should also be noted that Solé (1992) Three-phase strategies (Before, while and after the reading) proposed in the VLO activated student's prior knowledge related to the main topic of each reading cycle, allowing them to make predictions and deductions of what they could find in the texts, as well as allowing them to identify and become familiar with the vocabulary related to electricity and to analyze and reflect on the topic they read about, which let them to improve their inferential reading comprehension skills.

Likewise, even though at the beginning the students were a little shy to participate in the VLO, to read the texts and to perform the proposed reading comprehension activities, they did them with great enthusiasm since most of the time they felt very interested in the topics on which the proposed VLO reading cycles revolved (content related to electricity). In addition, it was evident that the students felt that the implementation of the VLO had a purpose that would favor their learning in relation to their career and personal interests which prompted them to carry out the reading cycles conscientiously and sought to use the inferential reading comprehension strategies proposed to success in the activities of the VLO, which reaffirms the importance of abandoning the traditional way of teaching foreign languages and teaching it from a real context, since the students will feel that the information they are learning is really useful and can be implemented outside the classroom. Finally, it could be observed that in many cases the participants not only accessed the information, activities and suggested texts in a very active and enthusiastic way, but also searched on their own for more information that could complement the Electricity topics they were learning in the VLO, which evidenced their interest, autonomy and desire to expand their learning process and that of their classmates, also recognizing the importance of reading in English and improving their reading comprehension skills.

Discussion

The results of the present study obtained through the data analysis process demonstrated that the design and implementation of a VLO based on electricity content gradually improved students' inferential reading comprehension skill. Those results are discussed in terms of the research question which was: How the design and development of a Virtual Learning Object (VLO) based on electricity content can strengthen the inferential reading comprehension skill in online English classes of a group of undergraduate distance students of the UPTC?

In that sense it can be stated that the mentioned results are in line with the study of Hernández,S.(2019) who affirmed that the implementation of VLO in the classroom not only promotes the student's higher reading comprehension, but also enhances their learning experiences and that "the development of reading strategies constitutes the core of a successful pedagogical intervention and that the support of a VLO contributes to it" (Hernández,2019, p.109) statement that was of great value for the current research since it demonstrated the importance of promoting reading comprehension strategies in students through digital resources that strengthens their reading comprehension skills, appeal their attention and allow them to understand the importance of the reading culture.

Regarding the strategies implemented in the VLO to improve the student's inferential reading comprehension skill through the design and development of the VLO, the teacher-researcher relied on the sole's (1992) reading strategies (See table 2) and on the Barrett's taxonomy's third level of reading comprehension, especially predicting outcomes, inferring main ideas from a text and inferring supporting details. These strategies are also in line and had a great impact on the results of the following studies:

Banditvilai,C. (2020) analyzed the effectiveness of reading strategies on reading comprehension of the second year English major students (who studied English Reading at the faculty of Liberal Arts and Science, Kasetsart University in Thailand) and the applicability of these strategies learned by students in their reading process. This research is of great importance for the present one since it implements some reading strategies that allow students to improve this skill, recognizing the importance of placing these strategies at an appropriate reading time (Before, during and after the reading).Likewise the author highlights the strategies of Skimming, Scanning, making predictions and questioning, strategies that in the case of the last two, were also implemented in this research. The result of the study implemented by Banditvilai, C. (2020) exposed that the student's implementation of reading strategies had a positive effect on their reading comprehension, since they allowed them to better understand the texts.

Regarding the study of Avendaño,Y.(2020) who exposed the importance of interactive methodological strategies to increase the literal, inferential and critical levels of reading comprehension taking into account the interactive model of Solé (1992); this research exposed the importance of the reading phases or moments (before, during and after the reading) where motivation, the importance of activating prior knowledge, the establishment of predictions about the text, shared reading, independent reading strategies, the recognition of errors in comprehension, obtaining the main idea of the text, the formulation of questions and suggested answers are developed. As well as the present study, the results suggested that the implementation of Solé's (1992) reading strategies largely achieved the improvement of student's literal and inferential reading comprehension skills, which is also in line to the Hurtado,S.(2022) quasi-experimental national study that aimed to evaluate the impact of Solé's (1992) reading strategies (before, during and after the reading) on fourth grader's reading comprehension skills

where she concluded that the use of reading strategies improved participants 'reading comprehension, allow them to identify the purposes of reading, establish predictions in the text read, predict the end of a story and focus on the main context of the text.

In his study about pedagogical strategies for the development of inferential reading Durán's, N.(2018) emphasized some theories and strategies focused on the development of inferential reading such as the strategies employed by Solé (1992); among these strategies the author highlighted some inferential reading strategies such as doing predictions, hypotheses and anticipations which in words of Blanco, (2005)cited by Durán's, N.(2018) "Serve to propose a context, and also directly apply the activation of prior knowledge". Other strategies highlighted in this study were questioning the text, the realization of hypotheses about the content of the text and what will happen later in the same one and the clarification of doubts about what has been read. The results revealed that several authors recognize the importance of implementing strategies such as prior knowledge in the development of the inferential capacity to understand a text and the importance of accompaniment the educational community to promote reading in students.

Concerning the results of Neva O's (2021) study about the incidence that digital media had on reading comprehension, the author exposed that digital media change the nature of participants reading and redirect preconceptions about reading comprehension. These results are very much in line with those of the present research, since the design and implementation of the VLO based on electricity content not only improved students' inferential reading comprehension skill but also changed their perception towards reading in English.

Finally, Purnamasari & Trisno (2022) went deeper into the use of five levels of the Barrett's taxonomy (literal comprehension, reorganization, inferential comprehension,

evaluation, and appreciation) in the analysis of reading comprehension, a taxonomy on which the teacher-research was based (mainly the third level related to inferential reading) to design some of the inferential reading strategies proposed in the VLO designed for the current study. The results of this international study are not in line with the results of the present one, since it exposed that despite having implemented the strategies of Barrett's Taxonomy, the reading comprehension skills of the students did not improve, which contrasts with the results of the this study where the improvement of the inferential reading comprehension skills of the students was evidenced in part thanks to the strategies proposed by the third level of Barrett's Taxonomy.

Conclusions

According to the results obtained in the present research, it can be concluded that the virtual learning object is a digital entity that based on the needs of the students and thanks to its interactive, self-conceived characteristics and the external and original materials embedded into the resource, together with the implementation of reading strategies of important authors such as Solé (1992) and Barrett (1968) and the different reading comprehension activities proposed in each reading cycle, it allowed to greatly improve the inferential reading skills of the students while they participated in the virtual English session, transforming the way they perceive English reading and the language itself, which allows the teacher-researcher to conclude that the objectives proposed in this research were fully met. However, as mentioned earlier in this document, it is essential to clarify that not all the inferential reading comprehension strategies proposed in each one of the reading cycles of the VLO favored all the students, therefore, it is essential that the students select the strategies with which they feel most comfortable and that are most appropriate to their type of learning, so that they can perceive an improvement in their reading comprehension. Finally, it can be concluded that the fact that students belong to the distance learning modality does not mean that they should have a passive role with unidirectional virtual classes. It is necessary to continue proposing educational proposals that not only integrate the use of ICT to bring students together in a virtual classroom but also where learning and English reading incentive is built around their motivations, interests and experiences.

Description of Difficulties and Their Overcoming

The following difficulties were encountered throughout the study:

1. One of the major difficulties that the teacher-researcher encountered in this research was the connectivity problem of some students since it delayed their learning process and improvement of inferential reading comprehension skills.

2. In the first reading cycle with the VLO some students were shy and predisposed to share their word clouds and read in English, many did not attend the synchronous class session.

Although the first difficulty represented a great inconvenience for the normal development of the research and it was impossible for the researcher-teacher to change the situation, the second difficulty was solved progressively since the attitude of those students towards the Virtual Learning Object and the English readings changed little by little, thanks to the implementation of the VLO related to Electricity, the reading comprehension strategies proposed and the accompaniment of the teacher and their peers.

Pedagogical Challenges and Recommendations

Due to the general objective of the present study was to analyze how the implementation of a Virtual Learning Object based on electricity content strengthen inferential reading comprehension skill in online English classes with undergraduate distance students at UPTC, one of the pedagogical challenges presented to the teacher researcher was to expand her knowledge regarding the usage of the digital resources needed to design a quality VLO, since the teacher-researcher had minimal experience in creating educational resources of this type, so as it is necessary to seek advice from people who have expertise in the area to carry out this type of project. Likewise, since the VLO is focused on the electricity contents, it was mandatory to carry out a previous research in relation to this topic, review in detail the curriculum of the students of technology in industrial electricity program and communicate with the teachers of this program to understand the different contents the students learn so that the VLO can meet the student's expectations and thus achieve the established research objective.

Regarding the inferential reading comprehension skill, although in the current research it was observed the improvement of this skill by the distance education students, it is recommended that the educational institution hold workshops transversally with other subjects directed to the development of this specific skill so that students continue to improve in this regard.

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Appendices

Appendix A

Informed Consent Form

INFORMED CONSENT FORM

Datos de contacto del docente investigador

Nombre: Ángela Vanessa Duarte Infante.

Celular: 3014530357

Correo: angela.duarte@uptc.edu.co

Respetado(a) Estudiante,

La docente Ángela Vanessa Duarte Infante se encuentra realizando el proyecto de Investigación **" Implementing a Virtual Learning Object based on electricity content to strengthen inferential reading comprehension skill in undergraduate distance students of Technology in Industrial Electricity at UPTC"** el cual es realizado como parte de los requisitos de grado propuestos por la **UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA** para la obtención del título de maestría en **Mediación Pedagógica en el Aprendizaje del Inglés.** Este proyecto de investigación tiene como objetivo principal diseñar e implementar un objeto virtual de aprendizaje enfocado en el contenido de electricidad para fortalecer la habilidad de lectura inferencial en las clases virtuales de inglés con estudiantes de pregrado a distancia de la UPTC

La participación de los estudiantes en este estudio es voluntaria, si usted accede a ser parte de él, es mandatorio que sea de su conocimiento que las sesiones de clase virtuales serán observadas y registradas en un diario de investigación por parte de la docente investigadora, la cual revisara y hará la transcripción de la información obtenida. Así mismo se le solicitará realizar las lecturas y actividades del objeto virtual de aprendizaje al igual que responder a un test y encuesta virtual con fines meramente académicos e investigativos que serán diligenciados de manera anónima al finalizar la investigación. Cabe mencionar que al momento de presentar los resultados de la presente investigación los nombres de los participantes serán totalmente omitidos y remplazados por Estudiante A, B o C.

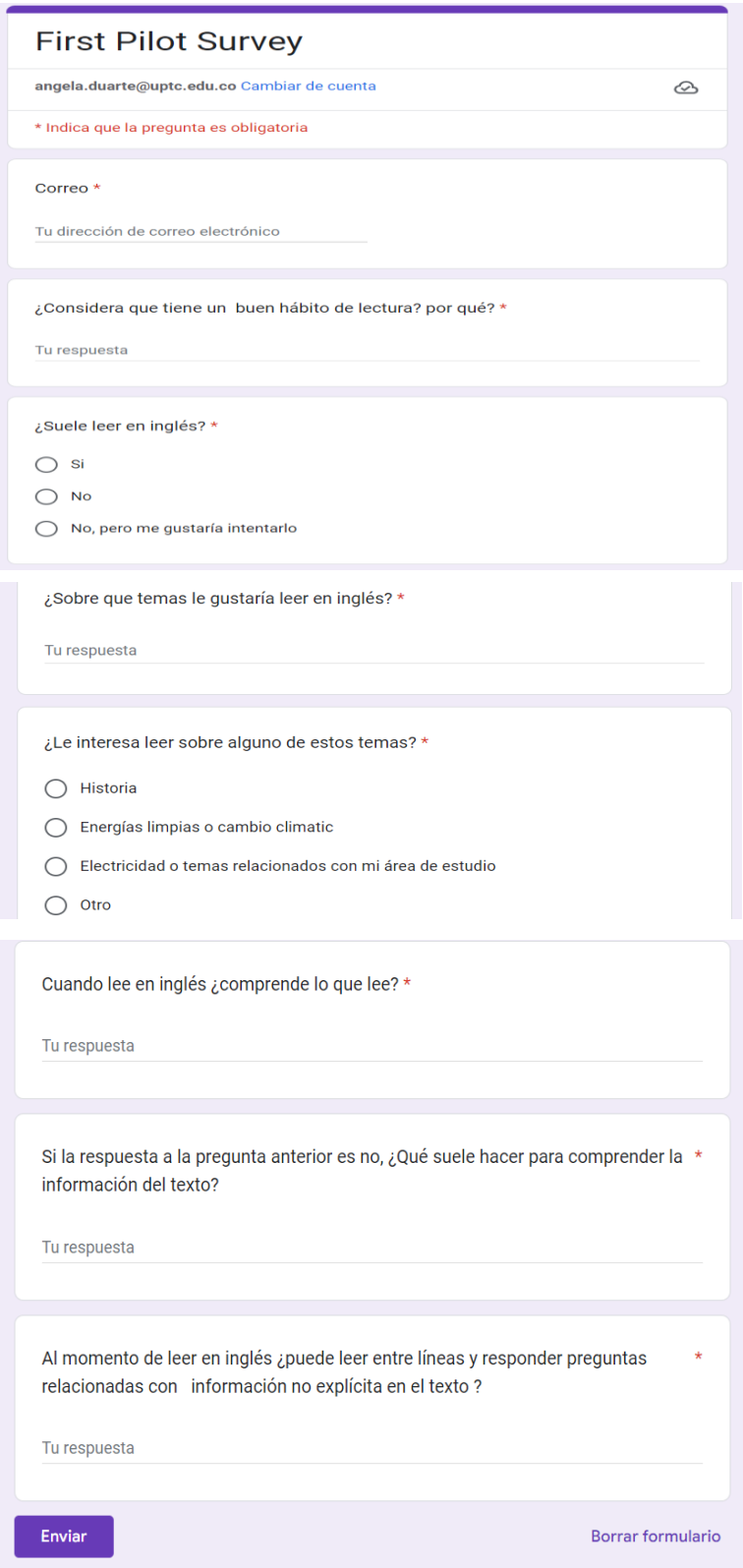
Es indispensable aclarar que se brindará a los participantes que lo soliciten la posibilidad de conocer los resultados de la investigación; así mismo el estudiante podrá retirarse de la investigación (si así lo desea) en cualquier momento. En razón a lo anteriormente mencionado si usted de manera voluntaria desea ser parte de la investigación puede indicar su autorización en el siguiente apartado: Yo ----------con cédula de ciudadanía número ----------expedida en la ciudad de----------acepto participar en el proyecto de investigación **" Implementing a Virtual Learning Object based on electricity content to strengthen inferential reading comprehension skill in undergraduate distance students of Technology in Industrial Electricity at UPTC"** pues conozco el objetivo de la investigación, los instrumentos con los cuales se recolectaran los datos necesarios para su desarrollo y accedo a participar en la realización del objeto virtual de aprendizaje, de la encuesta virtual y del test solicitado por la docente investigadora, comprendiendo que estos se realizarán de manera anónima protegiendo mi identidad y mi información personal.

Firma

_____

Appendix B

First Pilot Survey



First Pilot Survey

angela.duarte@uptc.edu.co Cambiar de cuenta

* Indica que la pregunta es obligatoria

Correo *

Tu dirección de correo electrónico

¿Considera que tiene un buen hábito de lectura? por qué? *

Tu respuesta

¿Suele leer en inglés? *

- Si
- No
- No, pero me gustaría intentarlo

¿Sobre que temas le gustaría leer en inglés? *

Tu respuesta

¿Le interesa leer sobre alguno de estos temas? *

- Historia
- Energías limpias o cambio climatic
- Electricidad o temas relacionados con mi área de estudio
- Otro

Cuando lee en inglés ¿comprende lo que lee? *

Tu respuesta

Si la respuesta a la pregunta anterior es no, ¿Qué suele hacer para comprender la información del texto? *

Tu respuesta

Al momento de leer en inglés ¿puede leer entre líneas y responder preguntas relacionadas con información no explícita en el texto ? *

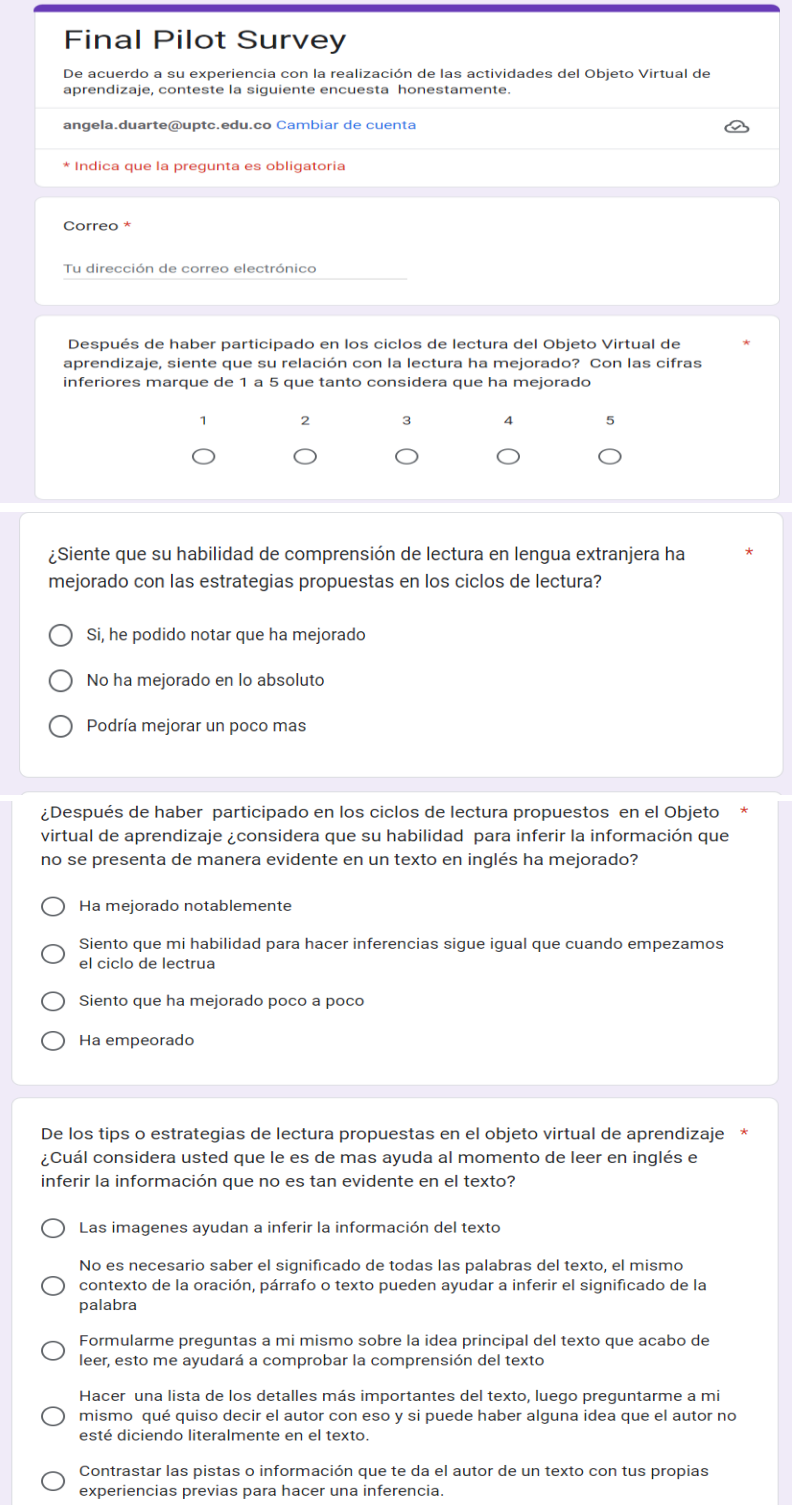
Tu respuesta

Enviar

Borrar formulario

Appendix C

Last Pilot Survey



Final Pilot Survey

De acuerdo a su experiencia con la realización de las actividades del Objeto Virtual de aprendizaje, conteste la siguiente encuesta honestamente.

angela.duarte@uptc.edu.co Cambiar de cuenta

* Indica que la pregunta es obligatoria

Correo *

Tu dirección de correo electrónico

Después de haber participado en los ciclos de lectura del Objeto Virtual de aprendizaje, siente que su relación con la lectura ha mejorado? Con las cifras inferiores marque de 1 a 5 que tanto considera que ha mejorado *

1 2 3 4 5

¿Siente que su habilidad de comprensión de lectura en lengua extranjera ha mejorado con las estrategias propuestas en los ciclos de lectura? *

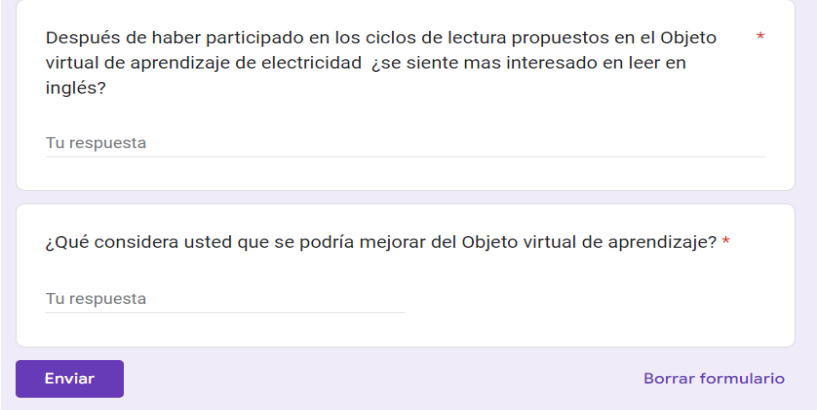
- Si, he podido notar que ha mejorado
- No ha mejorado en lo absoluto
- Podría mejorar un poco mas

¿Después de haber participado en los ciclos de lectura propuestos en el Objeto virtual de aprendizaje ¿considera que su habilidad para inferir la información que no se presenta de manera evidente en un texto en inglés ha mejorado? *

- Ha mejorado notablemente
- Siento que mi habilidad para hacer inferencias sigue igual que cuando empezamos el ciclo de lectrua
- Siento que ha mejorado poco a poco
- Ha empeorado

De los tips o estrategias de lectura propuestas en el objeto virtual de aprendizaje ¿Cuál considera usted que le es de mas ayuda al momento de leer en inglés e inferir la información que no es tan evidente en el texto? *

- Las imagenes ayudan a inferir la información del texto
- No es necesario saber el significado de todas las palabras del texto, el mismo contexto de la oración, párrafo o texto pueden ayudar a inferir el significado de la palabra
- Formularme preguntas a mi mismo sobre la idea principal del texto que acabo de leer, esto me ayudará a comprobar la comprensión del texto
- Hacer una lista de los detalles más importantes del texto, luego preguntarme a mi mismo qué quiso decir el autor con eso y si puede haber alguna idea que el autor no esté diciendo literalmente en el texto.
- Contrastar las pistas o información que te da el autor de un texto con tus propias experiencias previas para hacer una inferencia.


Después de haber participado en los ciclos de lectura propuestos en el Objeto virtual de aprendizaje de electricidad ¿se siente mas interesado en leer en inglés? *

Tu respuesta

¿Qué considera usted que se podría mejorar del Objeto virtual de aprendizaje? *

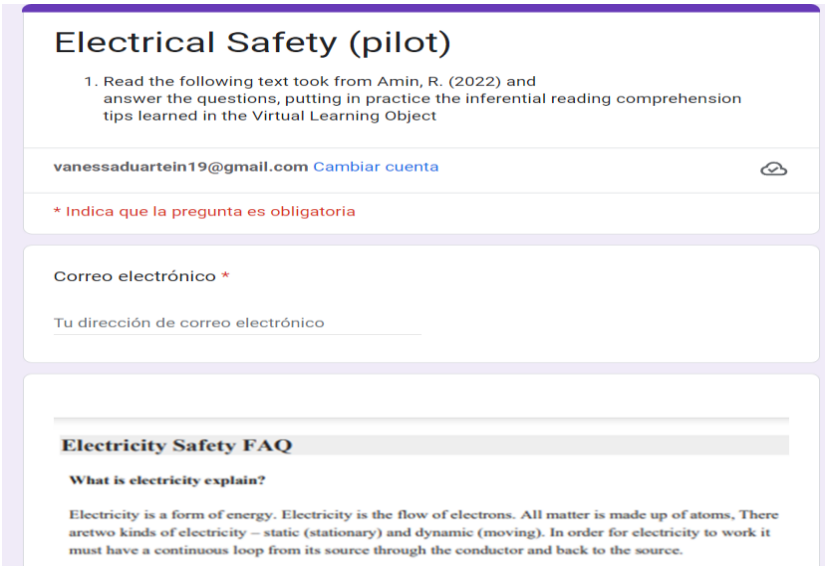
Tu respuesta

Enviar

Borrar formulario

Appendix D

Last Pilot Test


Electrical Safety (pilot)

1. Read the following text took from Amin, R. (2022) and answer the questions, putting in practice the inferential reading comprehension tips learned in the Virtual Learning Object

vanessaduartein19@gmail.com Cambiar cuenta

* Indica que la pregunta es obligatoria

Correo electrónico *

Tu dirección de correo electrónico

Electricity Safety FAQ

What is electricity explain?

Electricity is a form of energy. Electricity is the flow of electrons. All matter is made up of atoms, There aretwo kinds of electricity – static (stationary) and dynamic (moving). In order for electricity to work it must have a continuous loop from its source through the conductor and back to the source.

What are 5 electrical safety tips?

5 electrical safety tips you should know

1. Ensure that all electrical appliances, cords and fixtures carry ISI mark
2. Keep all electrically powered appliances and equipment dry and away from places where water is used.
3. Unplug electrical appliances when not in use.
4. Turn off electrical equipment while leaving the place.
5. Don't overload circuits. Install additional circuits if needed

What are the 3 hazards of electricity?

The main hazards with electricity are:
1. Electrical shock
2. Burns
3. Electrical fire & Explosion

What are some electrical safety rules?

8 Safety Precautions Every Electrician Should Know –

1. Make sure your electrical equipment is maintained properly. Regularly inspect tools, cords, grounds, and accessories. Make repairs only if you are authorized to do so. Otherwise, arrange to have equipment repairedor replaced immediately.

2. Make sure you use safely features like three-prong plugs, double-insulated tools, and safety switches. Besure machine guards are in place and that you always follow proper procedures.

3. Call electrician to carry out electrical repairs and lay wiring. (Only allow competent and qualifiedelectrician)

4. Cover all unused electrical outlets

5. Avoid use of electrical extension cords. If their use is necessary ensure that they are of correct rating andnot run through doors, walls, floors or any other location where they could be damaged.

6. Never use worn, frayed or damaged cords or appliances.

7. Follow correct specifications when replacing electrical fuses

8. Keep electric cables and cords clean and free from kinks. Never carry equipment by its cords.

Knowledge is a Commodity to be shared, Share this article to help others.

Thanking

Md Ruhul Amin Niloy
B.Sc in EEE (SEU)
mdruhulamin.niloy@gmail.com
Dhaka, Bangladesh

2. After reading the text, to which population do you think this text is addressed?

- ◯ Kindergarten children
- ◯ People who like camping
- ◯ People with knowledge of electricity / the general public who want to know about the good use of electricity.

3. Why do you think the author published this type of text?

Tu respuesta

4. Make the following prediction: what can happen if an electrical equipment is in contact with water?

Tu respuesta

5. What does the author mean when he says " make repairs only if you are authorized to do so"?

Tu respuesta

6. What do you think can happen if you are not authorized to make repairs?

Tu respuesta

7. What do you think is the main idea of the text?

Tu respuesta

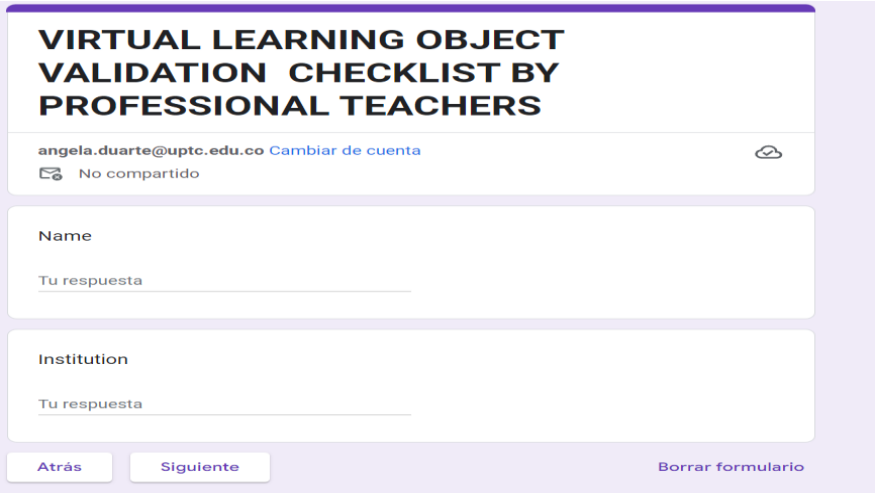
8. According to the author and your previous knowledge, what do you think you should do to avoid an electric shock?

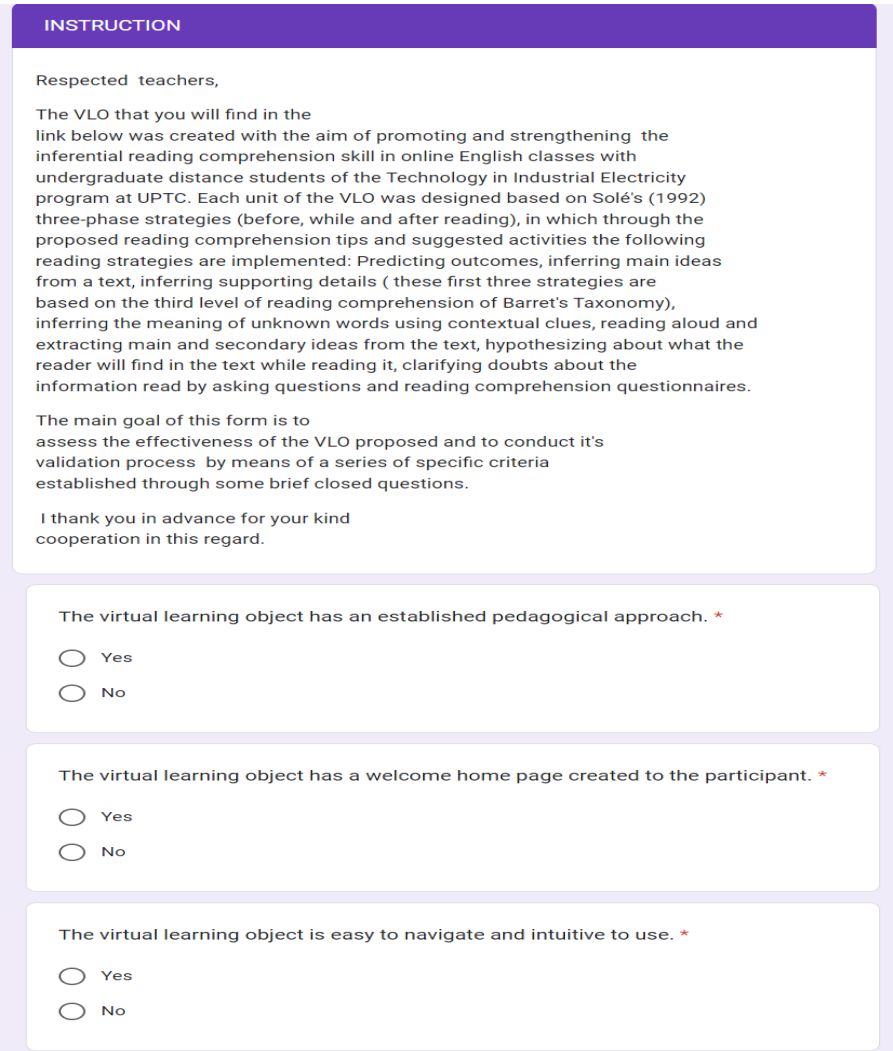
Tu respuesta

Enviar Página 1 de 1 Borrar formulario

Appendix E

Virtual Learning Object Validation Checklist by Professional Teachers





In the virtual learning object instructions are created to make the acquisition of knowledge and skills much more clear and effective for the student. *

- ◯ Yes
- ◯ No

The instructions of the virtual learning object enable the student to achieve the proposed objectives. *

- ◯ Yes
- ◯ No

The virtual learning object has an established learning outcome *

- ◯ Yes
- ◯ No

The resources and activities proposed in the virtual learning object support it's main objective. *

- ◯ Yes
- ◯ No

The content and activities proposed in the virtual learning Object favor the meaningful learning. *

- ◯ Yes
- ◯ No

The virtual learning Object has spaces that encourage the student to reflect on his own learning and on the learning content. *

- ◯ Yes
- ◯ No

Active learning activities are developed in the virtual learning object? *

- ◯ Yes
- ◯ No

The virtual learning object is focused on a specific skill *

- ◯ Yes
- ◯ No

The strategies employed in the virtual learning object promote and strengthen the inferential reading comprehension skill. *

- ◯ Yes
- ◯ No

The activities proposed in the virtual learning object have immediate feedback. *

- Yes
- No

The activities proposed in the virtual learning object are interactive. *

- Yes
- No

The virtual learning object has practice activities for students. *

- Yes
- No

The tips or strategies proposed in the virtual learning object can be easily understood and meet the aim of strengthen the inferential reading comprehension skill *

- Yes
- No

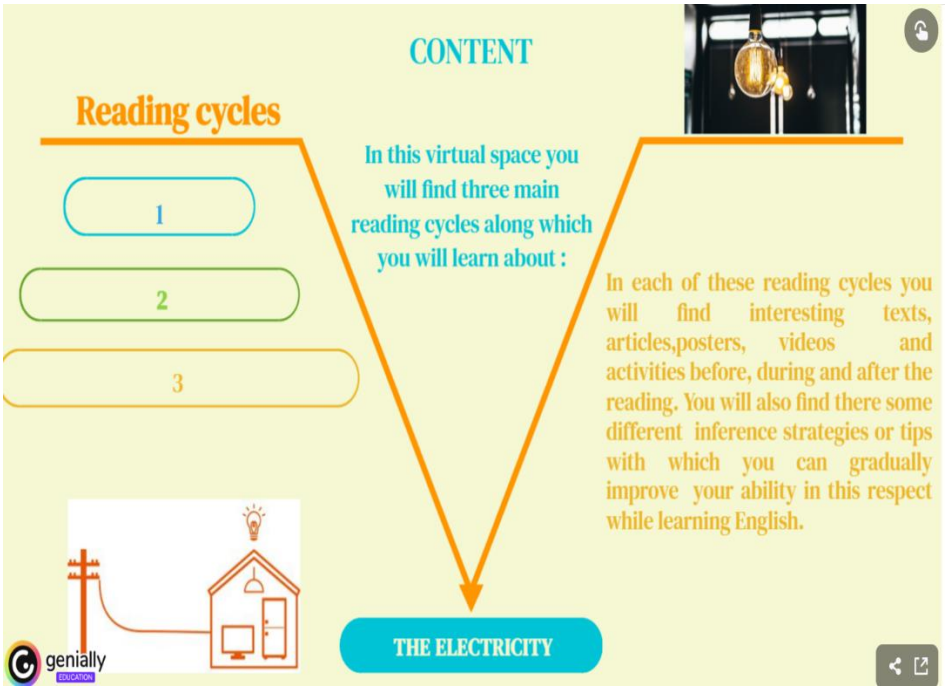
According to the objectives of the virtual learning object, do you consider that the evaluation activities are appropriate? *

- Yes
- No

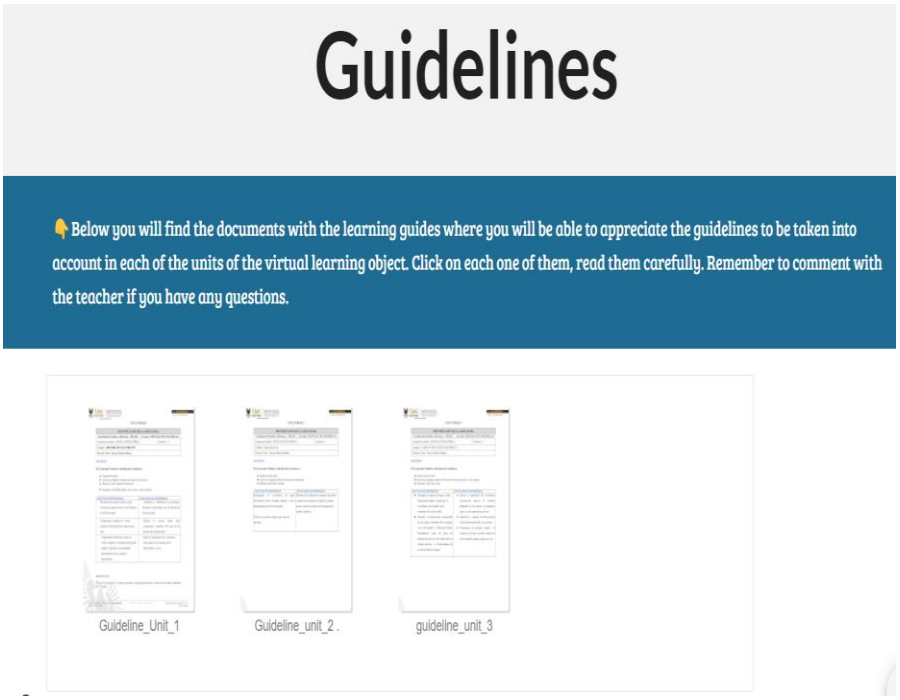
Atrás | Enviar | Borrar formulario

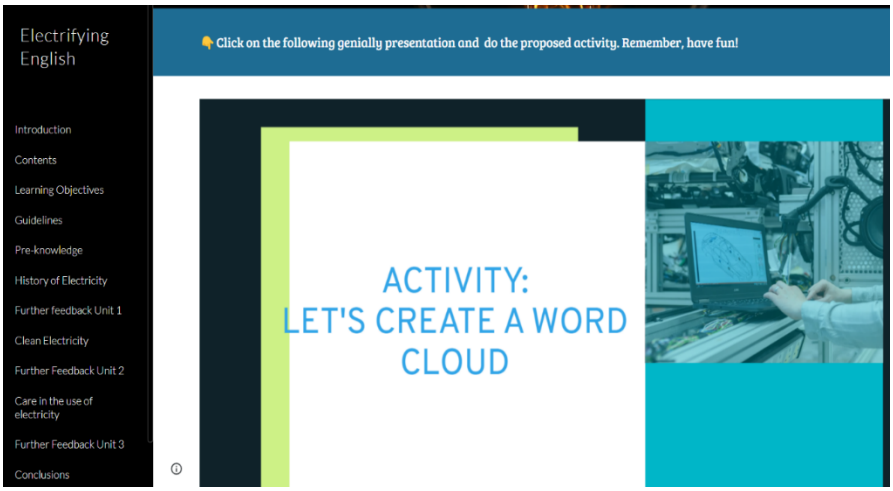
Appendix F

Electrifying English-Virtual Learning Object


CONTENT
Reading cycles
1
2
3
In this virtual space you will find three main reading cycles along which you will learn about :
In each of these reading cycles you will find interesting texts, articles,posters, videos and activities before, during and after the reading. You will also find there some different inference strategies or tips with which you can gradually improve your ability in this respect while learning English.
THE ELECTRICITY
genially


Electrifying English
Introduction
Contents
Learning Objectives
Guidelines
Pre-knowledge
History of Electricity
Further feedback Unit 1
Clean Electricity
Further Feedback Unit 2
Care in the use of electricity
Further Feedback Unit 3
Conclusions
LEARNING OBJECTIVES
01
To expand your knowledge related to electricity, its history,clean energies and its proper use.
02
To learn new vocabuary in English related to


Guidelines
👇Below you will find the documents with the learning guides where you will be able to appreciate the guidelines to be taken into account in each of the units of the virtual learning object. Click on each one of them, read them carefully. Remember to comment with the teacher if you have any questions.
Guideline_Unit_1
Guideline_unit_2 .
guideline_unit_3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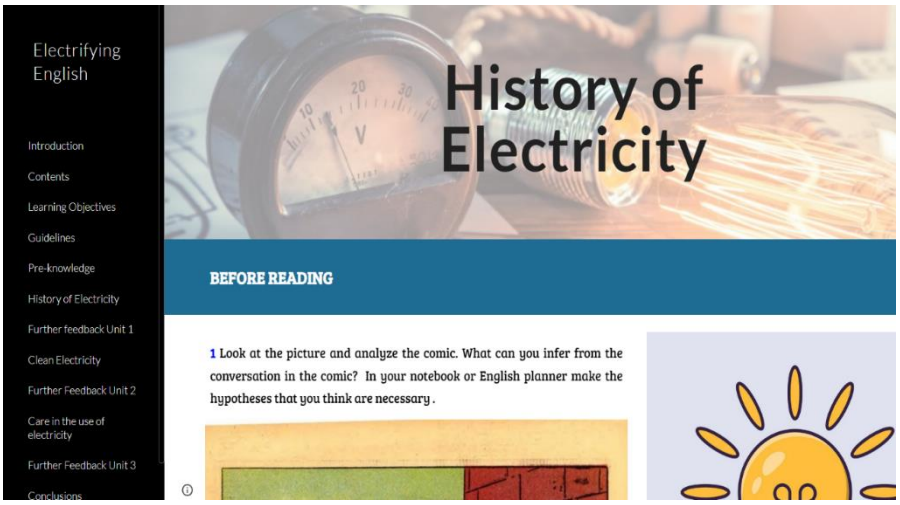
Further Feedback Unit 2
Care in the use of electricity
Further Feedback Unit 3
Conclusions
👇Click on the following genially presentation and do the proposed activity. Remember, have fun!
ACTIVITY:
LET'S CREATE A WORD CLOUD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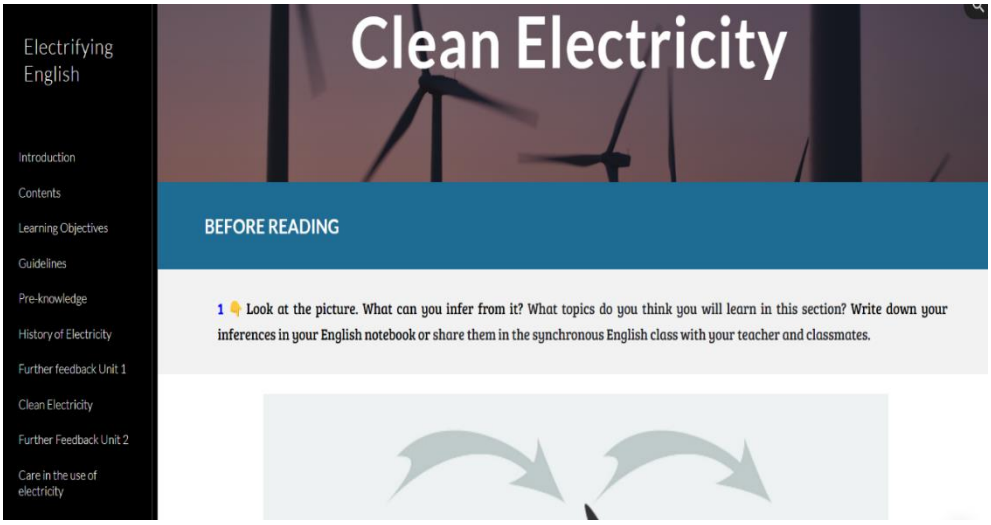
Further Feedback Unit 3
Conclusions
History of Electricity
BEFORE READING
1 Look at the picture and analyze the comic. What can you infer from the conversation in the comic? In your notebook or English planner make the hypotheses that you think are necessary.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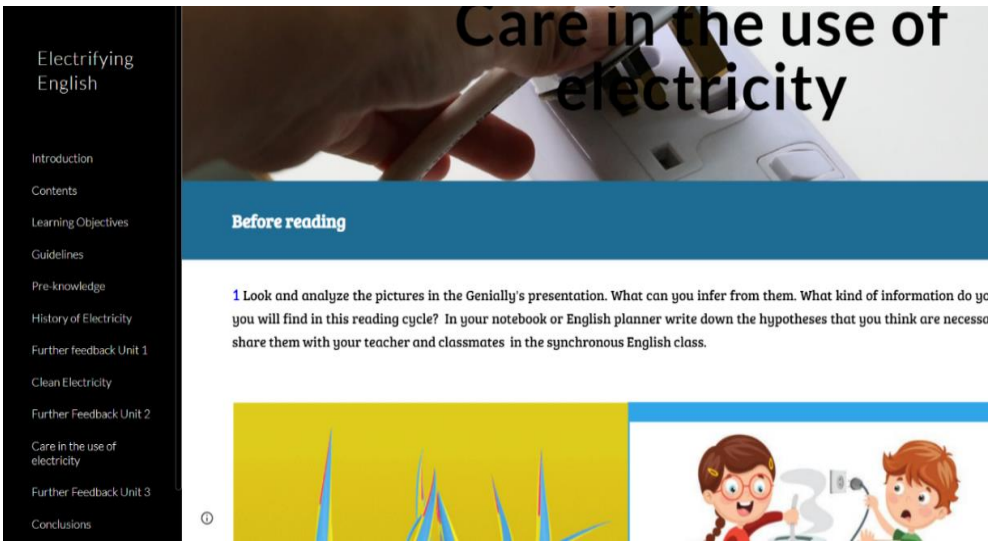
Clean Electricity
Further Feedback Unit 2
Care in the use of electricity
Clean Electricity
BEFORE READING
1 Look at the picture. What can you infer from it? What topics do you think you will learn in this section? Write down your inferences in your English notebook or share them in the synchronous English class with your teacher and classmates.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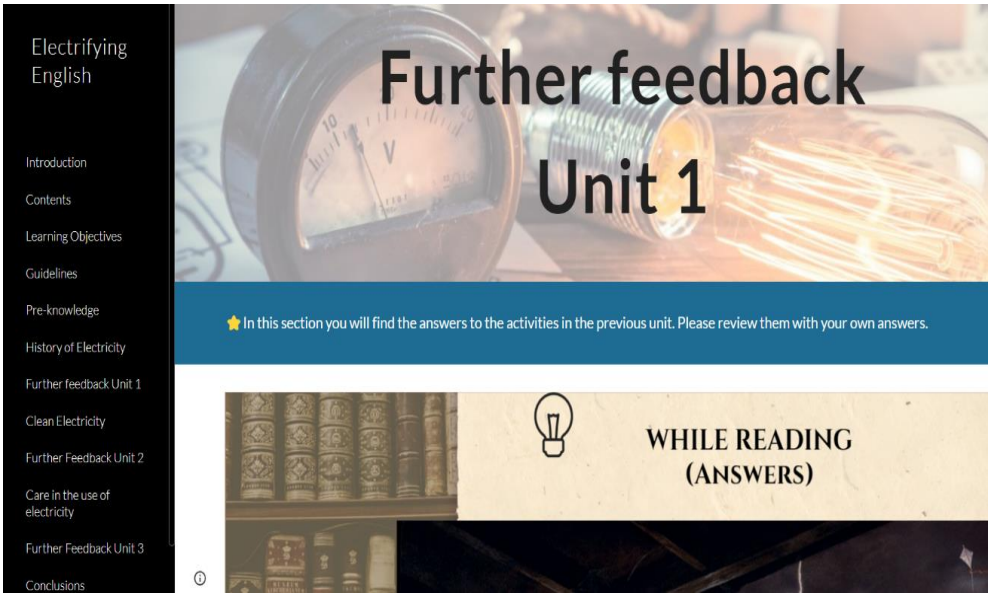
Further Feedback Unit 2
Care in the use of electricity
Further Feedback Unit 3
Conclusions
Care in the use of electricity
Before reading
1 Look and analyze the pictures in the Genially's presentation. What can you infer from them. What kind of information do yo
you will find in this reading cycle? In your notebook or English planner write down the hypotheses that you think are necessa
share them with your teacher and classmates in the synchronous English class.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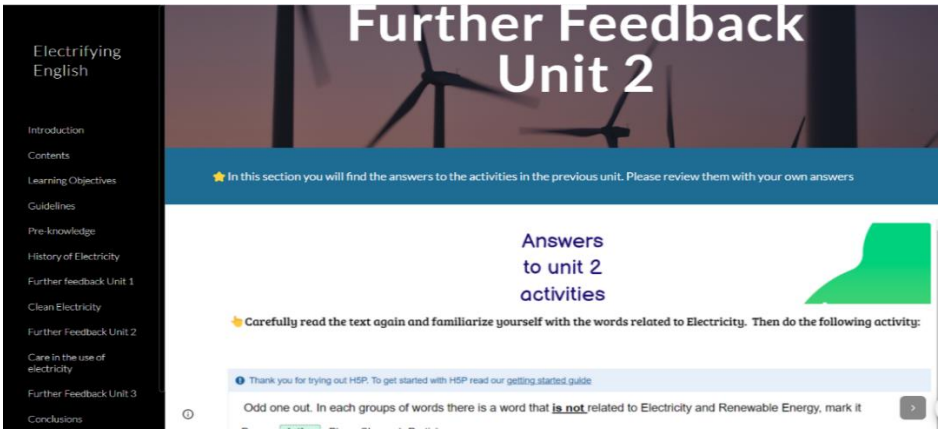
Clean Electricity
Further Feedback Unit 2
Care in the use of electricity
Further Feedback Unit 3
Conclusions
Further feedback Unit 1
In this section you will find the answers to the activities in the previous unit. Please review them with your own answers.
WHILE READING (ANSWERS)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Further Feedback Unit 2
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Further Feedback Unit 3
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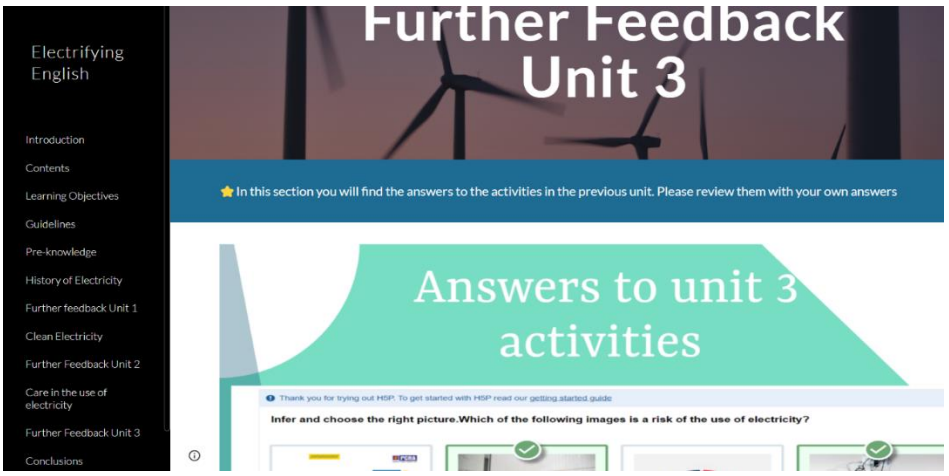
Further Feedback Unit 2
In this section you will find the answers to the activities in the previous unit. Please review them with your own answers
Answers to unit 2 activities
Carefully read the text again and familiarize yourself with the words related to Electricity. Then do the following activity:
Thank you for trying out H5P. To get started with H5P read our getting started guide
Odd one out. In each groups of words there is a word that is not related to Electricity and Renewable Energy, mark it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Further Feedback Unit 2
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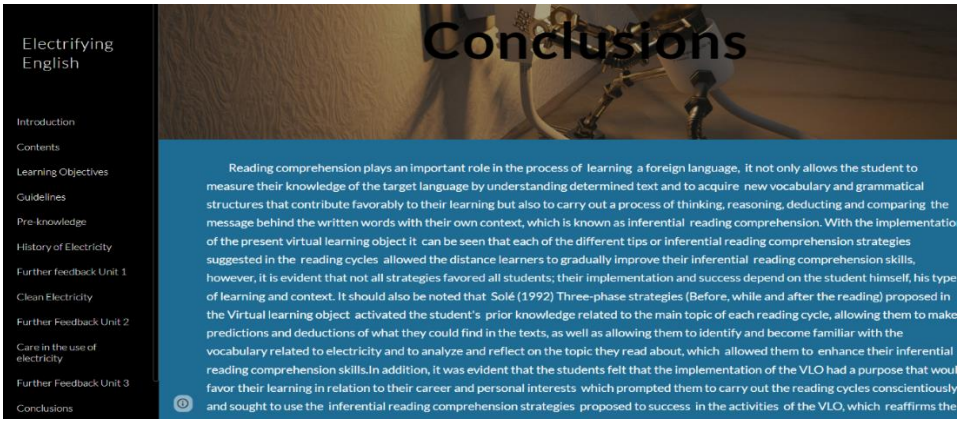
Further Feedback Unit 3
Conclusions
Further Feedback Unit 3
In this section you will find the answers to the activities in the previous unit. Please review them with your own answers
Answers to unit 3 activities
Thank you for trying out H5P. To get started with H5P read our getting started guide
Infer and choose the right picture.Which of the following images is a risk of the use of electricity?


Electrifying English
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Further Feedback Unit 3
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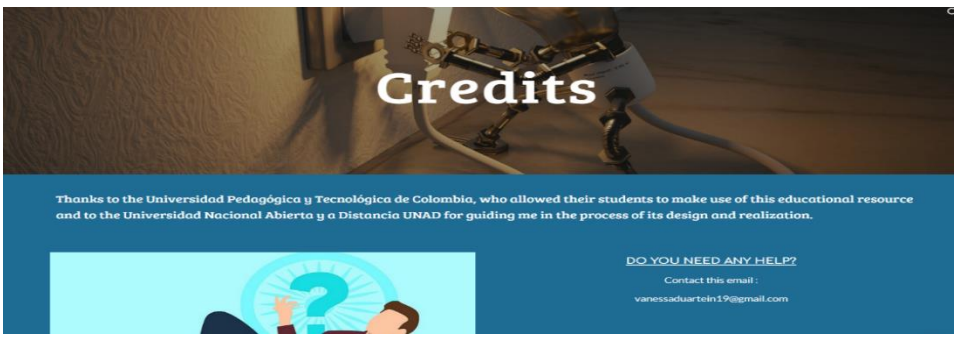
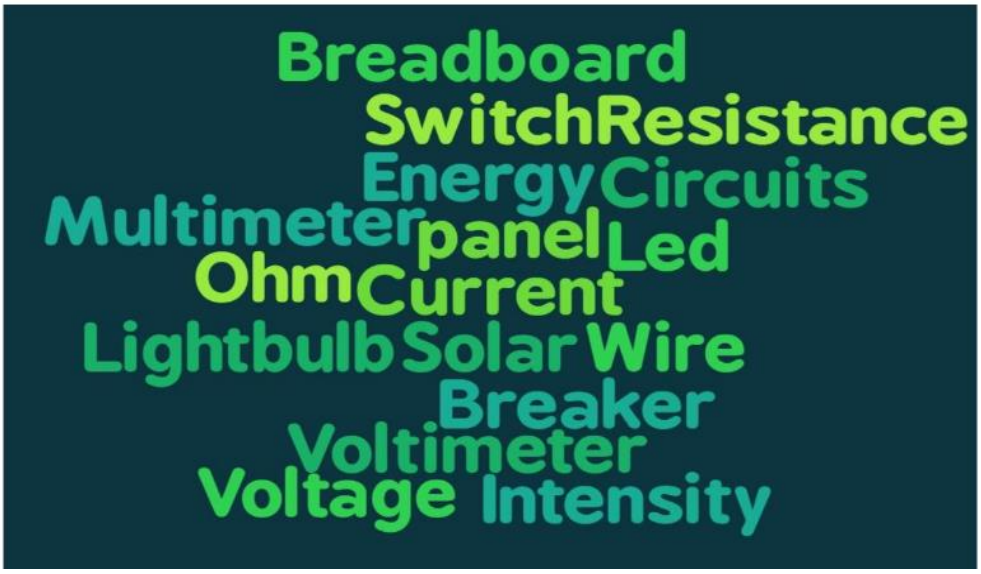
Conclusions
Reading comprehension plays an important role in the process of learning a foreign language, it not only allows the student to measure their knowledge of the target language by understanding determined text and to acquire new vocabulary and grammatical structures that contribute favorably to their learning but also to carry out a process of thinking, reasoning, deducting and comparing the message behind the written words with their own context, which is known as inferential reading comprehension. With the implementatio of the present virtual learning object it can be seen that each of the different tips or inferential reading comprehension strategies suggested in the reading cycles allowed the distance learners to gradually improve their inferential reading comprehension skills, however, it is evident that not all strategies favored all students; their implementation and success depend on the student himself, his type of learning and context. It should also be noted that Solé (1992) Three-phase strategies (Before, while and after the reading) proposed in the Virtual learning object activated the student's prior knowledge related to the main topic of each reading cycle, allowing them to make predictions and deductions of what they could find in the texts, as well as allowing them to identify and become familiar with the vocabulary related to electricity and to analyze and reflect on the topic they read about, which allowed them to enhance their inferential reading comprehension skills.In addition, it was evident that the students felt that the implementation of the VLO had a purpose that woul favor their learning in relation to their career and personal interests which prompted them to carry out the reading cycles conscientiously and sought to use the inferential reading comprehension strategies proposed to success in the activities of the VLO, which reaffirms the

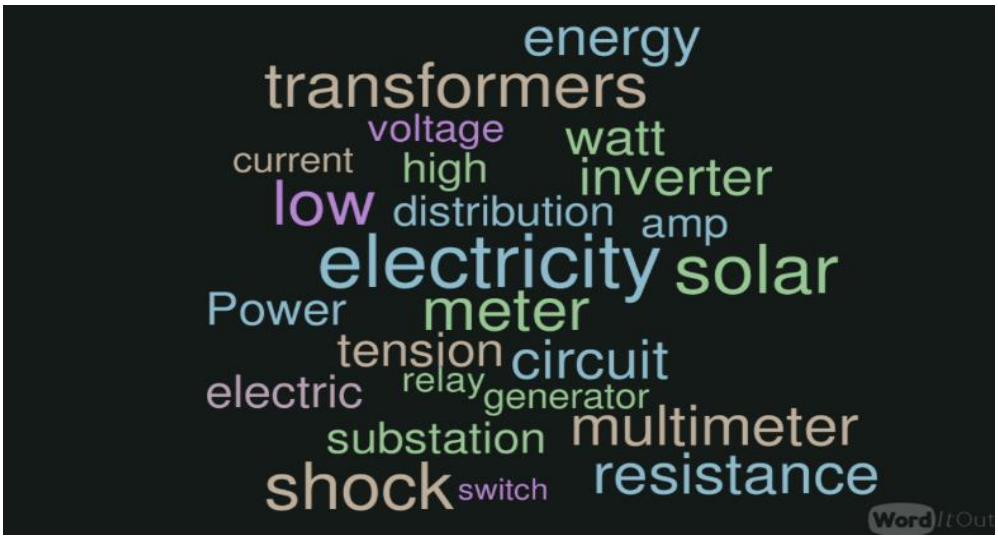

Credits
Thanks to the Universidad Pedagógica y Tecnológica de Colombia, who allowed their students to make use of this educational resource and to the Universidad Nacional Abierta y a Distancia UNAD for guiding me in the process of its design and realization.
DO YOU NEED ANY HELP?
Contact this email :
vanessaduartein19@gmail.com

Appendix G

Student's Artifacts

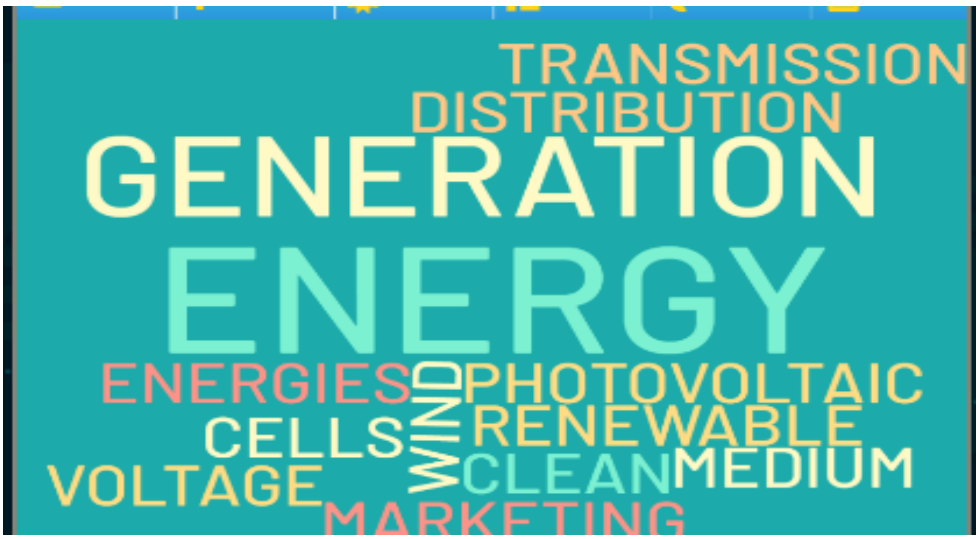


Note. Pre knowledge activity. Took from Student B

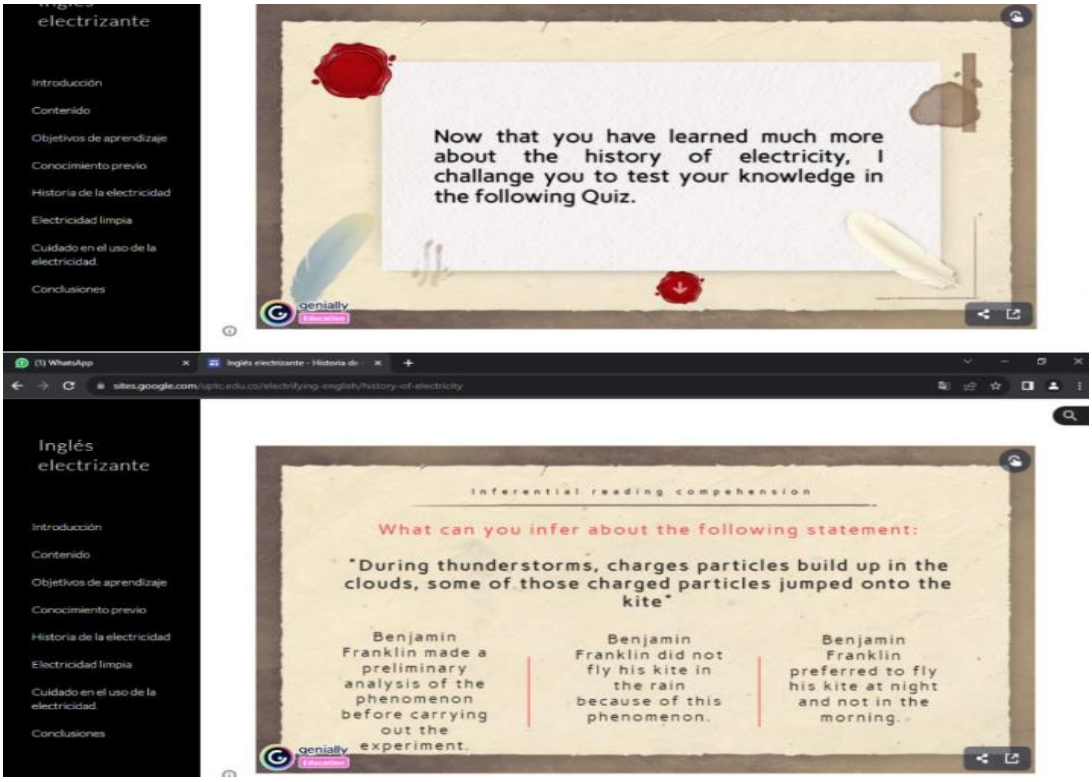


Note. Pre knowledge activity. Took from Student A

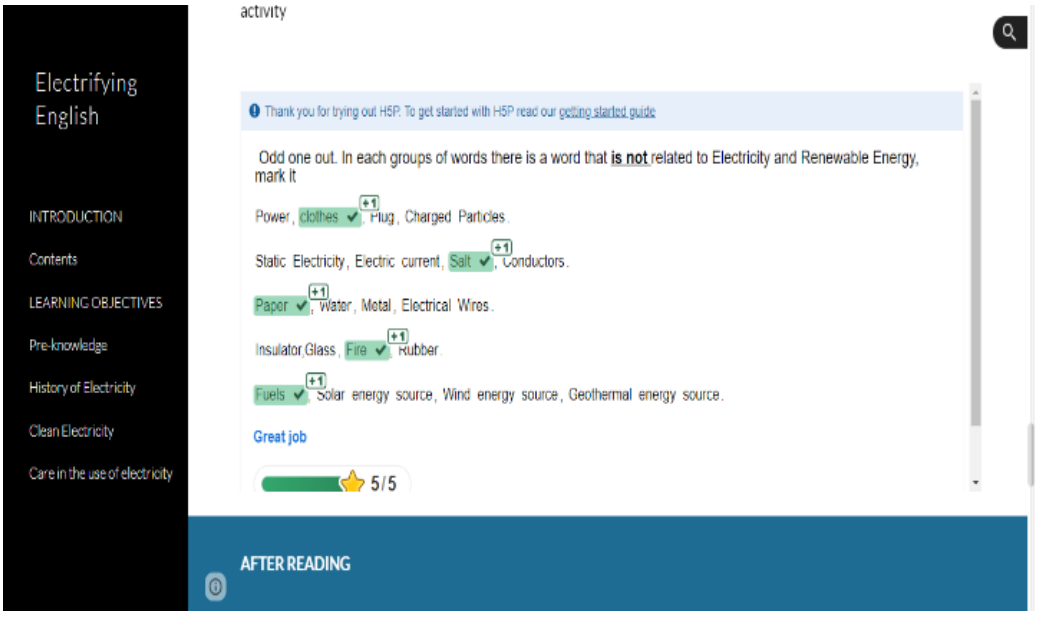
Note. Pre knowledge activity. Took from Student C



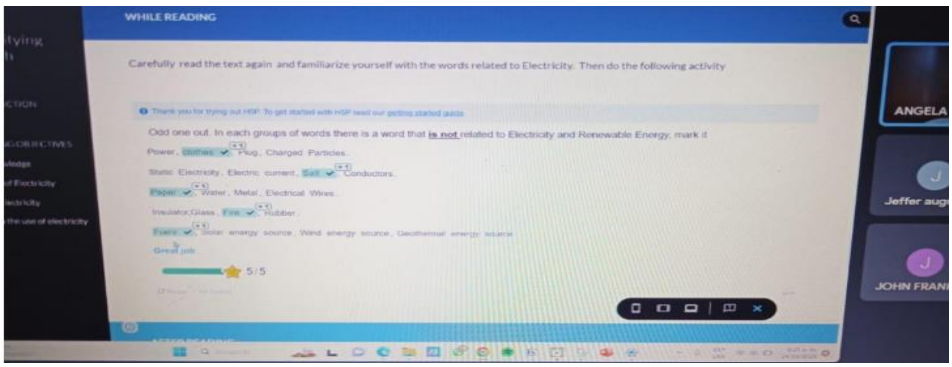
Note. Pre knowledge activity. Took from Student D



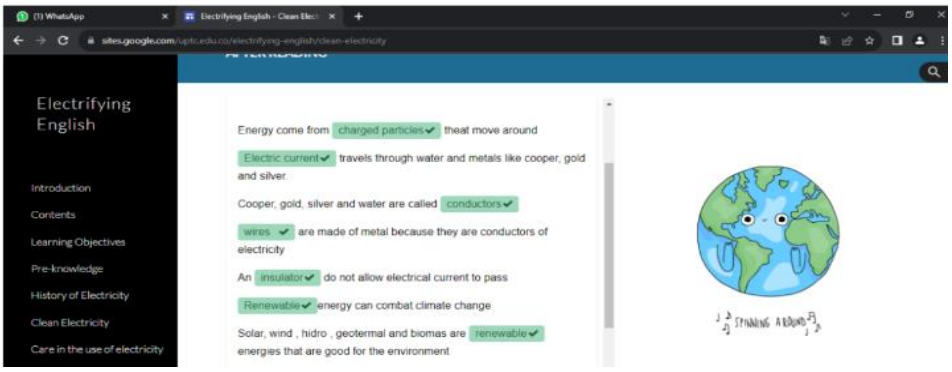
Note. Reading Cycle 1. Took from student A



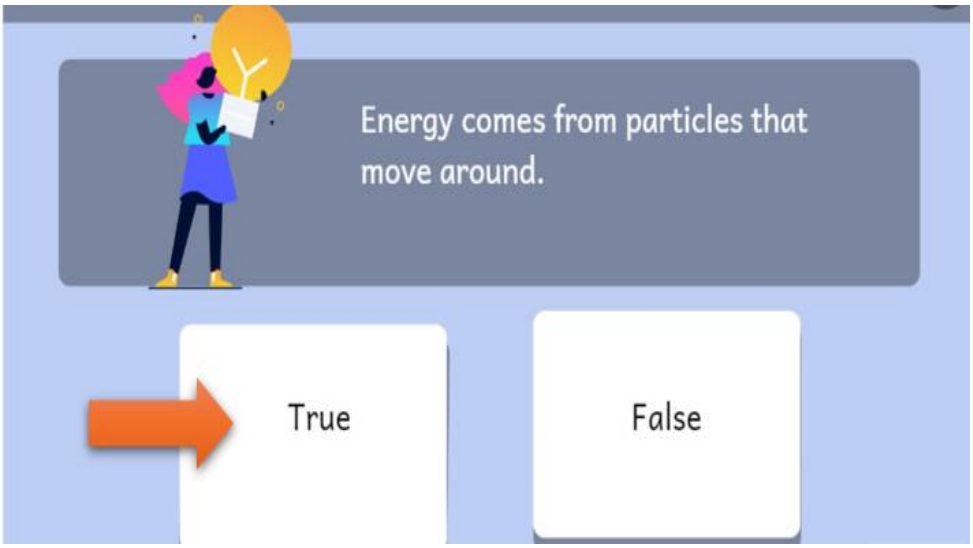
Note. Reading Cycle 1. Took from student A



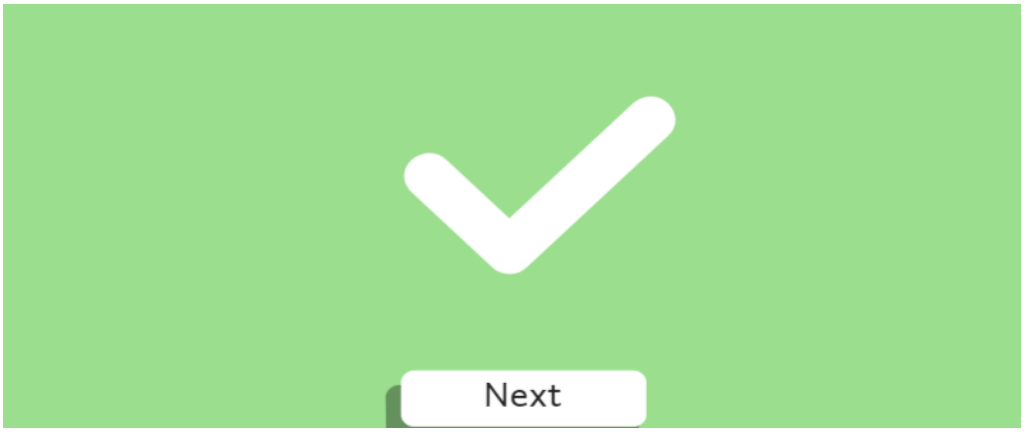
Note. Reading Cycle 2. Took from student F



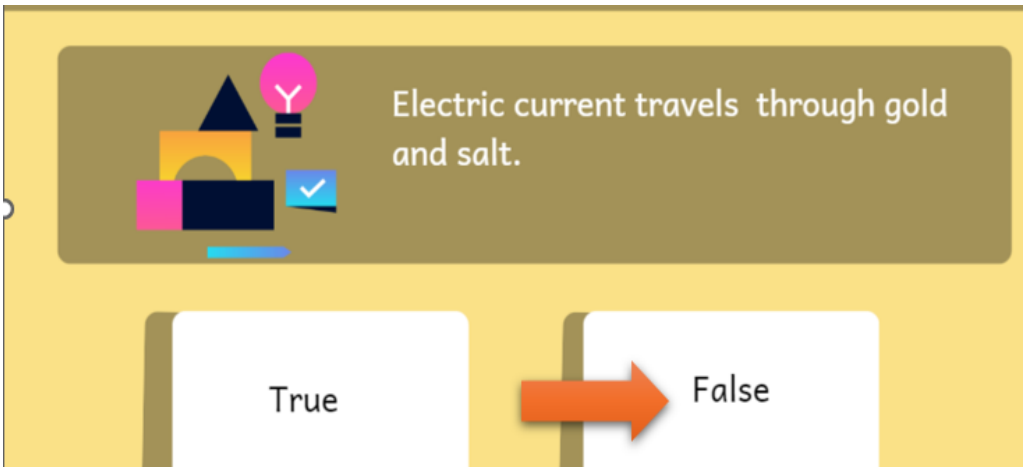
Note. Reading Cycle 2. Took from student F



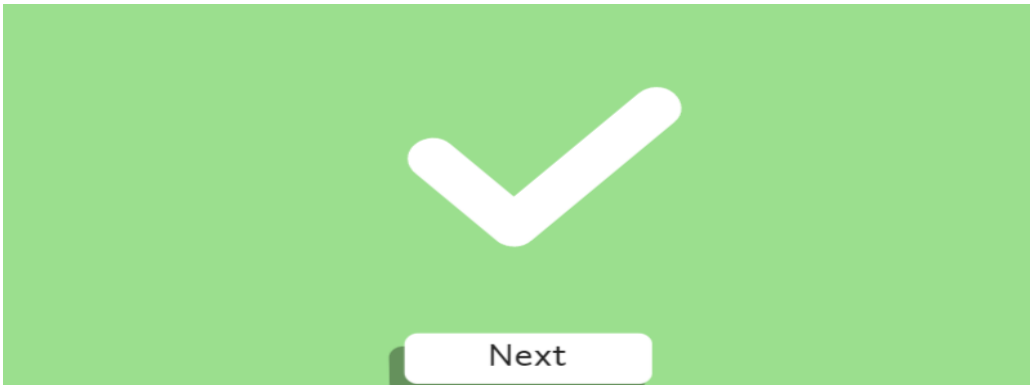
Note. Reading Cycle 2. Took from student B



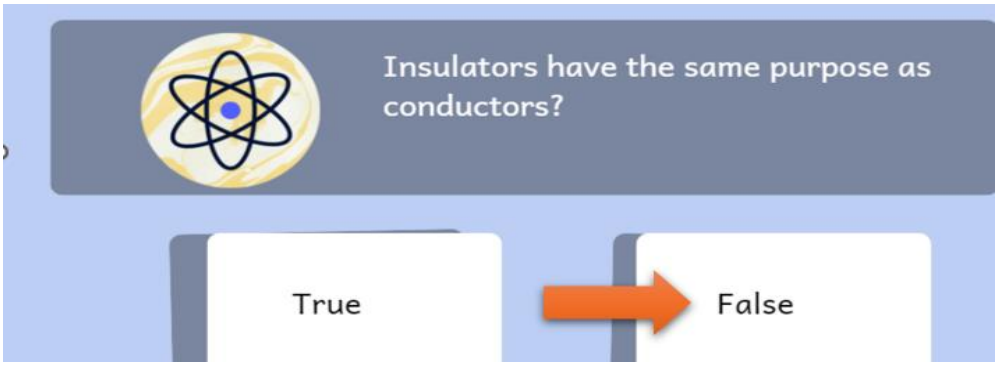
Note. Reading Cycle 2. Took from student B



Note. Reading Cycle 2. Took from student B



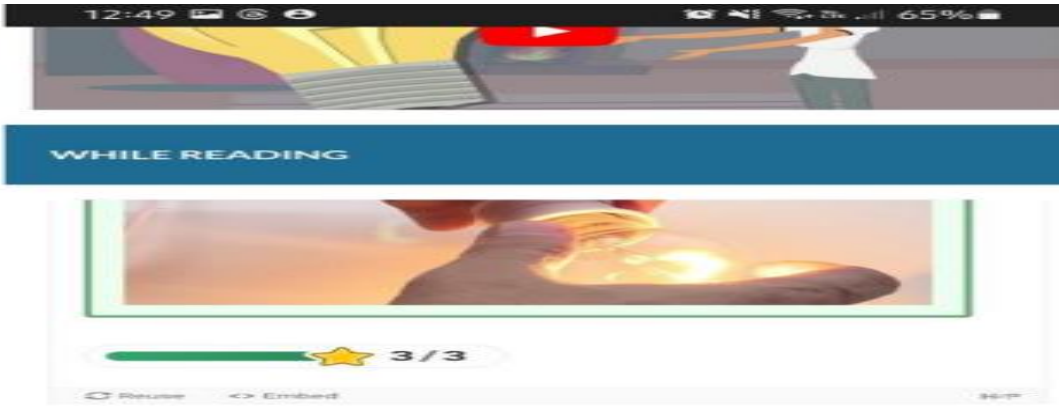
Note. Reading Cycle 2. Took from student B



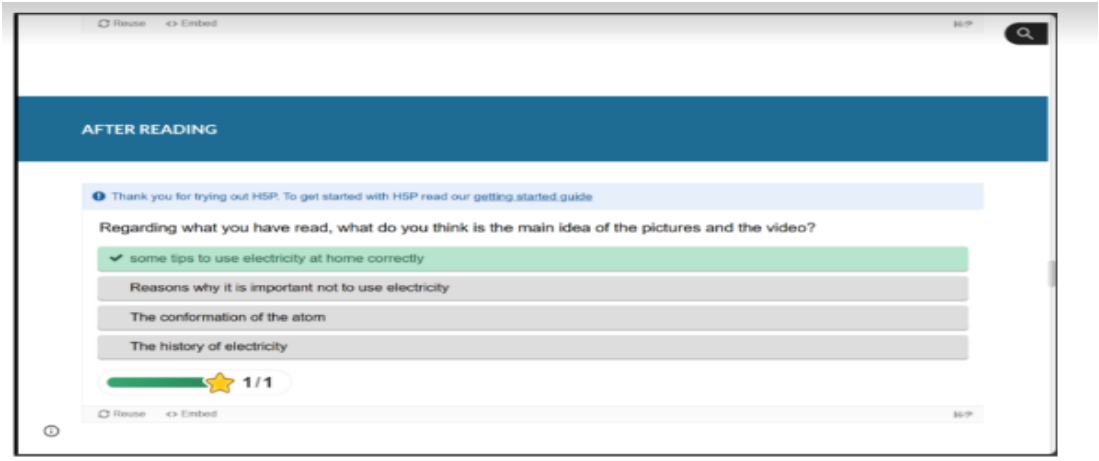
Note. Reading Cycle 2. Took from student B

Note. Reading Cycle 2. Took from student B

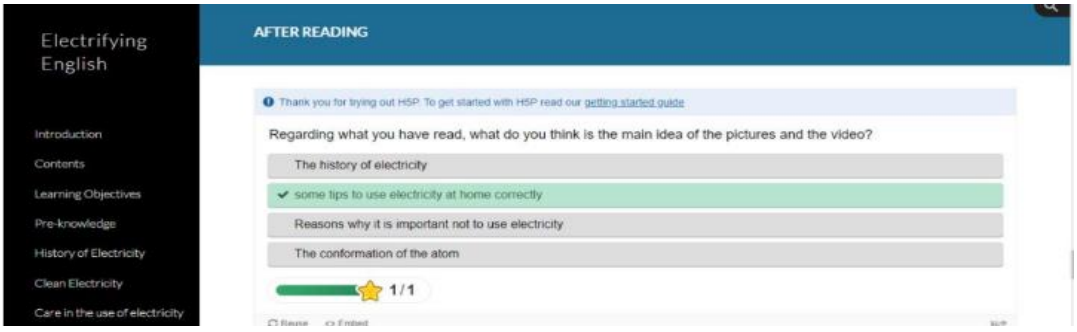
Note. Reading Cycle 3. Took from student D



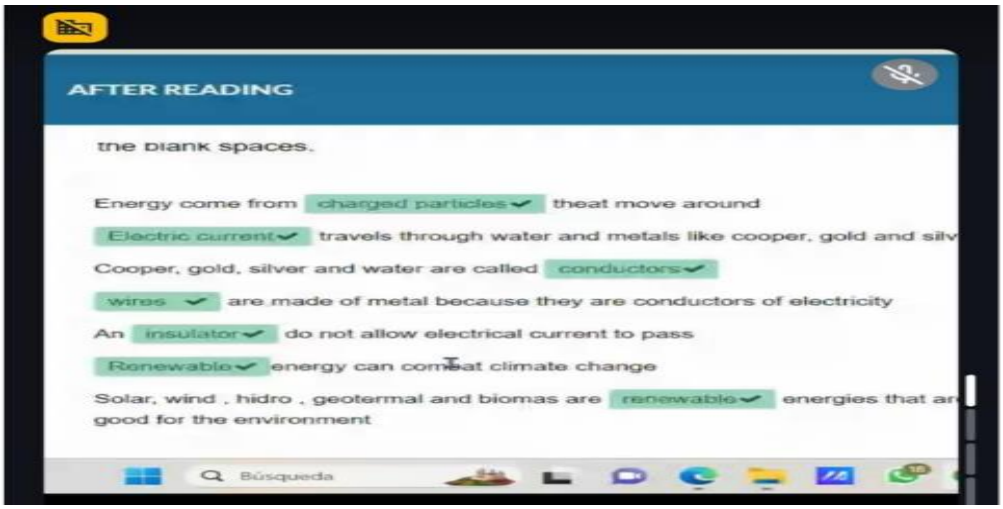
Note. Reading Cycle 3. Took from student A



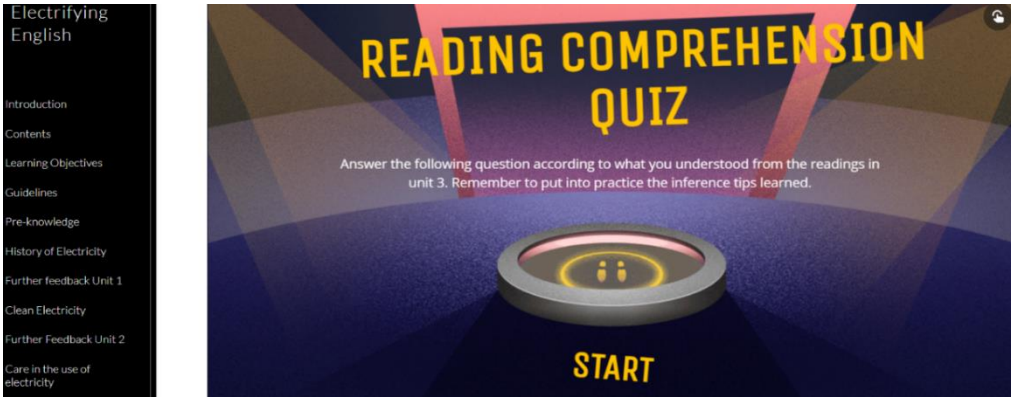
Note. Reading Cycle 3. Took from student A



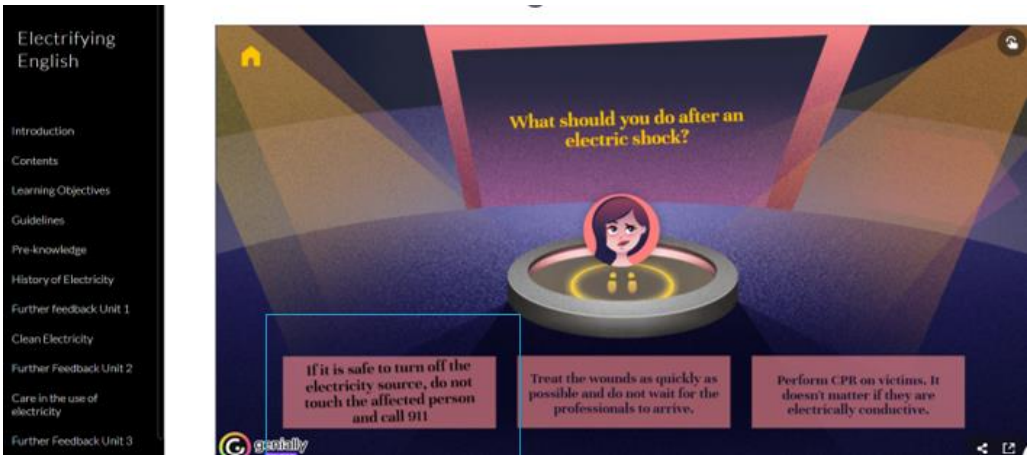
Note. Reading Cycle 3. Took from student C



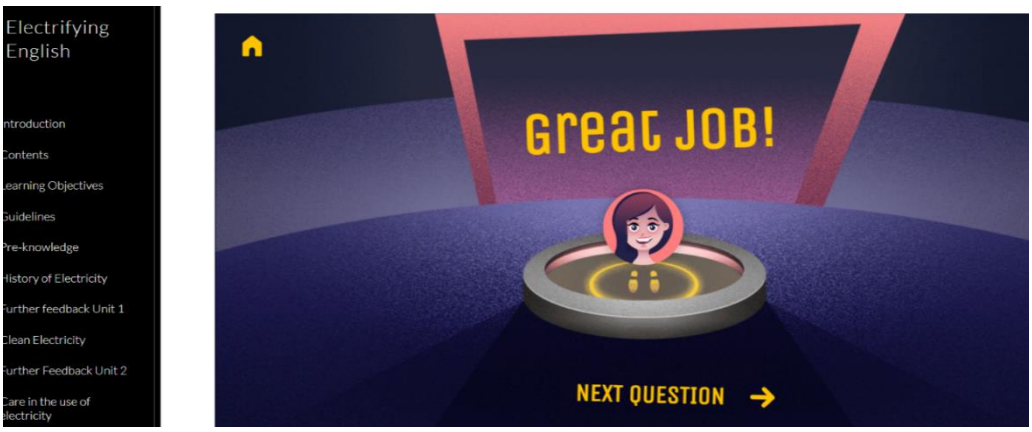
Note. Reading Cycle 3. Took from student B



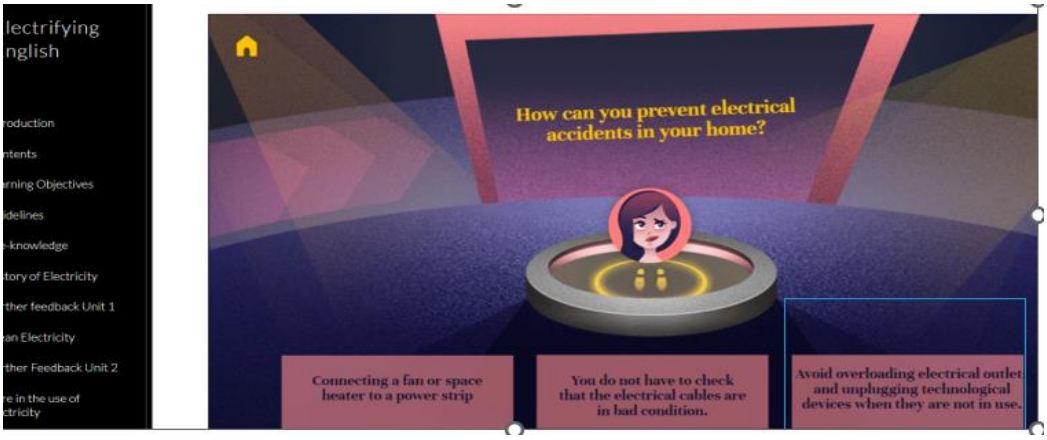
Note. Reading Cycle 3. Took from student D



Note. Reading Cycle 3. Took from student D

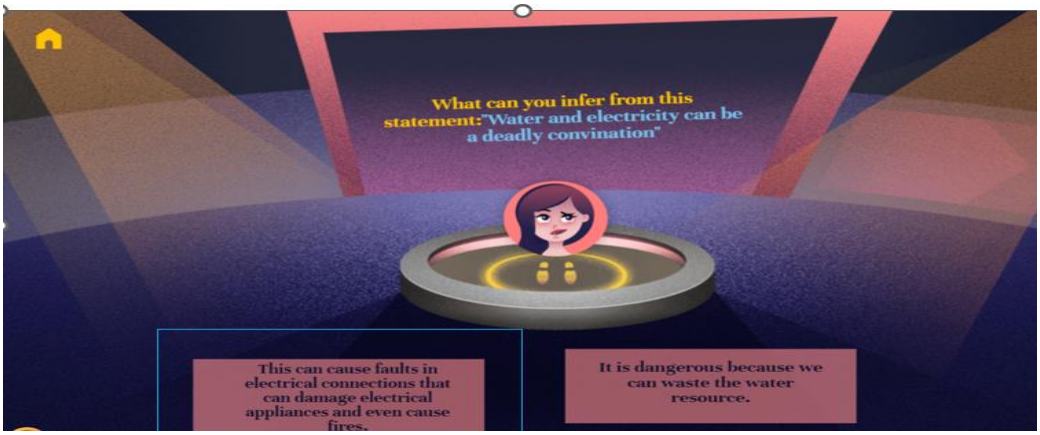


Note. Reading Cycle 3. Took from student D

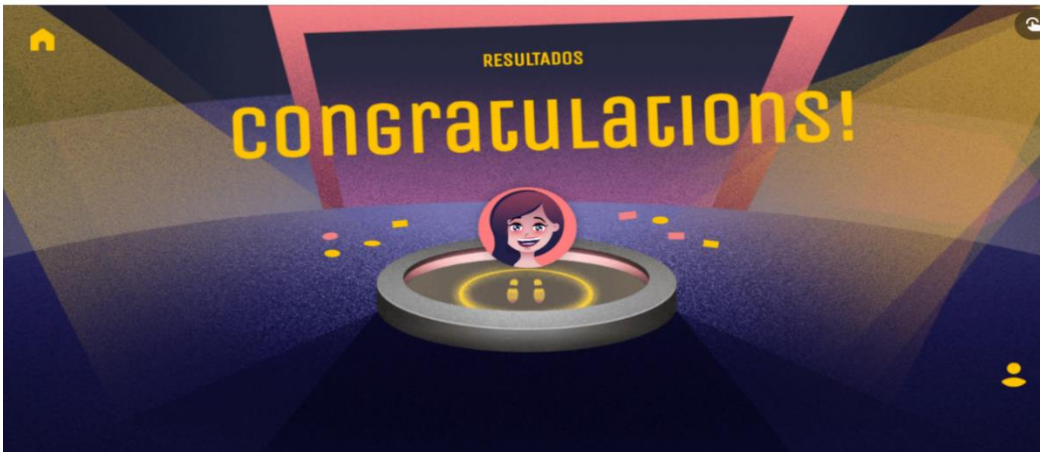


Note. Reading Cycle 3. Took from student D

Note. Reading Cycle 3. Took from student D



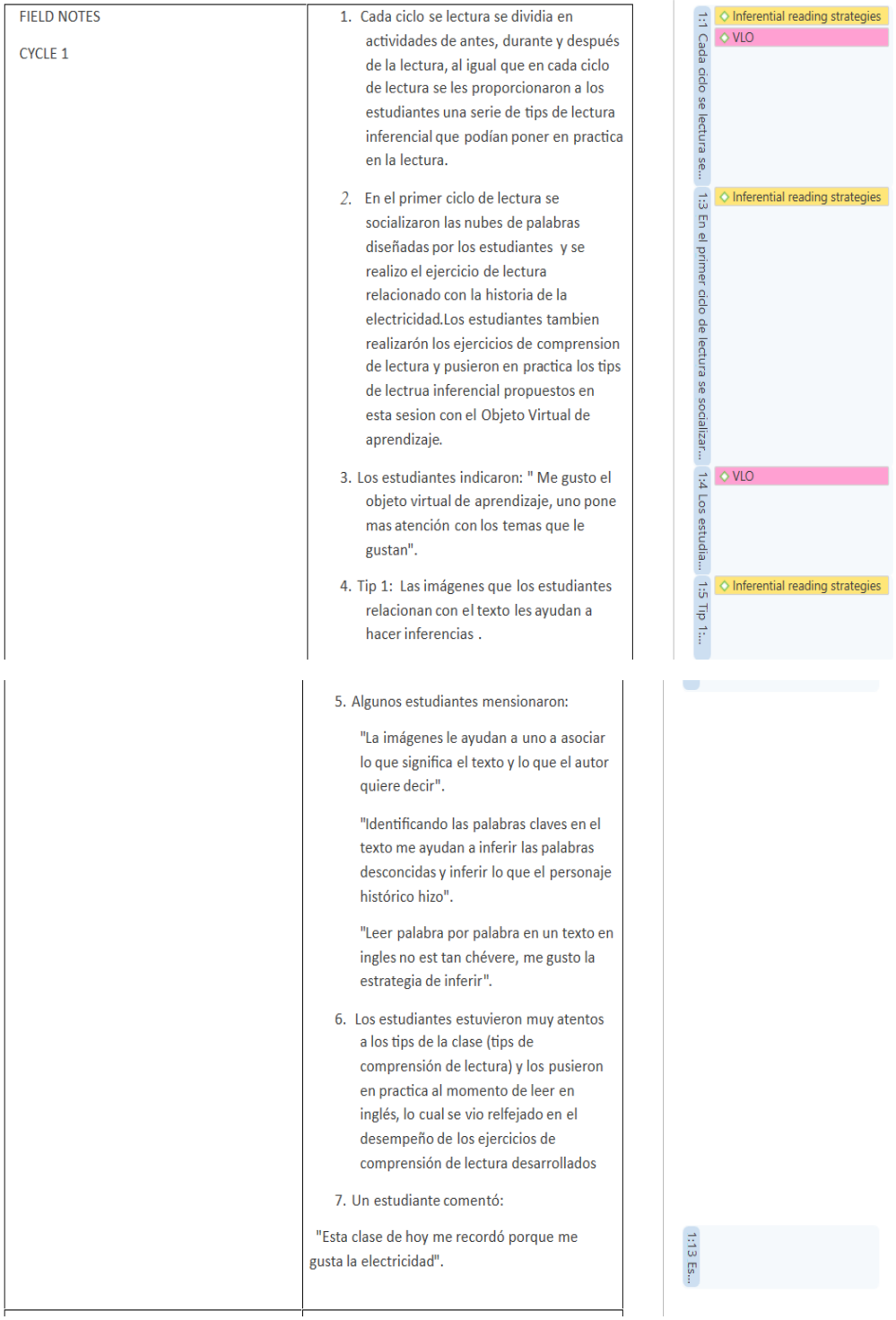
Note. Reading Cycle 3. Took from student D



Note. Reading Cycle 3. Took from student D

Appendix H

Excerpt From a Field Note Took From VLO Cycle 1



FIELD NOTES CYCLE 1	1. Cada ciclo se lectura se dividia en actividades de antes, durante y después de la lectura, al igual que en cada ciclo de lectura se les proporcionaron a los estudiantes una serie de tips de lectura inferencial que podían poner en practica en la lectura. 2. En el primer ciclo de lectura se socializaron las nubes de palabras diseñadas por los estudiantes y se realizo el ejercicio de lectura relacionado con la historia de la electricidad.Los estudiantes tambien realizarón los ejercicios de comprension de lectura y pusieron en practica los tips de lectrua inferencial propuestos en esta sesion con el Objeto Virtual de aprendizaje. 3. Los estudiantes indicaron: " Me gusto el objeto virtual de aprendizaje, uno pone mas atención con los temas que le gustan". 4. Tip 1: Las imágenes que los estudiantes relacionan con el texto les ayudan a hacer inferencias .
	5. Algunos estudiantes mensionaron: "La imágenes le ayudan a uno a asociar lo que significa el texto y lo que el autor quiere decir". "Identificando las palabras claves en el texto me ayudan a inferir las palabras desconcidas y inferir lo que el personaje histórico hizo". "Leer palabra por palabra en un texto en ingles no est tan chévere, me gusto la estrategia de inferir". 6. Los estudiantes estuvieron muy atentos a los tips de la clase (tips de comprensión de lectura) y los pusieron en practica al momento de leer en inglés, lo cual se vio relfejado en el desempeño de los ejercicios de comprensión de lectura desarrollados 7. Un estudiante comentó: "Esta clase de hoy me recordó porque me gusta la electricidad".

Appendix I

Resumen Analítico en Educación (RAE)

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	Implementing a Virtual Learning Object based on electricity content to strengthen inferential reading comprehension skill in undergraduate distance students of Technology in Industrial Electricity at UPTC.
Linea de Investigación	Bilingüismo en la educación a distancia mediada por tecnologías
Author	Angela Vanessa Duarte Infante
Fecha de Publicación	2024
Palabras Clave	Virtual learning object, reading, Inferential reading comprehension skills, E learning, Electricity.
Description	
The research work presented below is carried out with the purpose of designing and developing a Virtual Learning Object (VLO) based on electricity content to strengthen inferential reading comprehension skill in online English classes to a group of undergraduate distance students at UPTC.	

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Aparicio, M., Bacao, F., & Oliveira, T. (2016). *An e-Learning Theoretical Framework.* Educational Technology & Society, 19 (1), 292–307. file:///C:/Users/ASUS/Downloads/24.pdf

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Methodology

This research project followed a qualitative approach; this type of research investigates people's experiences, behaviors, attitudes, and interactions in their natural settings. In this study, qualitative approach was implemented to analyze and understand how the design and development of a Virtual Learning Object based on electricity content could strengthen the inferential reading comprehension skill in online English classes of the study's participants. Likewise with the purpose of answering the question stated in this research, the researcher carried out action research following the action cycle of planning, action, observation and reflection.

For the analysis of the data, the researcher followed the steps proposed by the Thematic analysis, where the information related to the implementation of the VLO focused on Electricity in the English virtual classes was coded and organized into themes that expressed specific information about the research question.

Results

Each of the different tips or inferential reading comprehension strategies suggested in the reading cycles of the VLO allowed the distance learners to gradually improve their inferential reading comprehension skills, however, it is evident that not all strategies favored all students, their implementation and success depended on the student himself, his type of learning and context. It should also be noted that Solé (1992) Three-phase strategies (Before, while and after the reading) proposed in the VLO activated student's prior knowledge related to the main topic of each reading cycle, allowing them to make predictions and deductions of

what they could find in the texts, as well as allowing them to identify and become familiar with the vocabulary related to electricity and to analyze and reflect on the topic they read about, which let them to improve their inferential reading comprehension skills