RESEARCH ARTICLE

Didactic Use of Hypermedial Texts for the Promotion of Inferential Reading in English

Uso didáctico de los textos hipermediales para la promoción de la lectura inferencial en inglés

Uso didático de textos hipermídia para a promoção da leitura inferencial em inglês.

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ABSTRACT

In view of the challenges involved in the teaching and learning of English during the pandemic caused by Sars-Covid19 in secondary and middle school education, a study was proposed with the objective of analyzing the didactic use of hypermedia texts for the promotion of inferential reading in English in Spanish-speaking students in the eleventh grade. The methodology applied was the collective case study, with the participation of five students from a public educational institution in the city of Medellin, Colombia. The instruments used were the field diary, to record information on the development of the workshops, and the electronic survey, to know the perspective of the students. Three categories emerged in the results: contributions of the hypermedia characteristics to inferential reading, reading strategies applied by the students and difficulties presented in the didactic intervention. The conclusions state that the characteristics of hypermedia texts diversify the possibilities of comprehension of English texts by students with different levels of proficiency in the foreign language. On the other hand, when the design of the activities is overloaded with hypermedia resources, it affects the interest and cognitive skills associated with reading.

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RESUMEN

Frente a los retos que implicó la enseñanza y el aprendizaje del inglés durante el tiempo de pandemia provocada por el Sars-Covid19, en la educación secundaria y media, se planteó un estudio que tenía como objetivo analizar el uso didáctico de los textos hipermediales para la promoción de la lectura inferencial en inglés en estudiantes de habla española, que se encontraban cursando el grado once. La metodología aplicada fue el estudio de caso colectivo, donde participaron cinco estudiantes de una institución educativa pública de la ciudad de Medellín, Colombia. Los instrumentos utilizados fueron el diario de campo, para el registro de la información sobre el desarrollo de los talleres y la encuesta electrónica, para conocer la perspectiva de los estudiantes. En los resultados emergieron tres categorías: aportes de las características hipermediales a la lectura inferencial, estrategias de lectura aplicadas por los estudiantes y dificultades presentadas en la intervención didáctica. En las conclusiones se afirma que las características de los textos hipermediales diversifican las posibilidades de comprensión de los textos en inglés por parte de los estudiantes con diferentes niveles de dominio de la lengua extranjera. Por otra parte, cuando el diseño de las actividades está sobrecargado de recursos hipermediales afecta el interés y las habilidades cognitivas asociadas a la lectura.

RESUMO

Diante dos desafios envolvidos no ensino e aprendizagem de inglês durante o tempo da pandemia causada pelo Sars-Covid19, no ensino médio e médio, foi proposto um estudo que teve como objetivo analisar o uso didático de textos hipermídia para a promoção da leitura inferencial em inglês em alunos de língua espanhola, que estavam na décima primeira série. A metodologia aplicada foi o estudo de caso coletivo, onde participaram cinco estudantes de uma instituçãopública de ensino da cidade de Medellín, Colômbia. Os instrumentos utilizados foram o diário de campo, para registrar as informações sobre o desenvolvimento das oficinas e a pesquisa eletrônica, para conhecer a perspectiva dos alunos. Três categorias emergiram nos resultados: contribuições das características hipermediais para a leitura inferencial, estratégias de leitura aplicadas pelos alunose dificuldades apresentadas na intervenção didática. As conclusões afirmam que as características dos textos hipermídia diversificam as possibilidades de compreensão de textos em inglês por alunos com diferentes níveis de domínio da língua estrangeira. Por outro lado, quando o desenho das atividades está sobrecarregado com recursos hipermídia, afeta o interesse e as habilidades cognitivas associadas à leitura.

Introduction

The ways and methods of learning a foreign language have changed in recent decades, giving rise to various approaches and systems of teaching and learning. There has been a shift from traditional grammar and translation methods to communicative approaches in which the four skills are developed: listening, speaking, reading and writing, taking advantage of technologies that allow for real live or recorded interaction. Some techniques and materials must be adapted to different teaching and learning situations, especially those that allow autonomy. In the didactics of foreign languages, teaching should be adjusted based on the needs, objectives and motivations for the person's know-how (Jimenez, 2010; Wan Kassim, 2021). Likewise, Vez (2011) and Titar-Improgo and Gatcho, (2020) state that foreign language teaching is given a communicative and functional approach, with attention to the pragmatic aspects of language, so that the word is not distanced from action or thought, so that the learner can feel motivated in his learning to the extent that he is able to perceive that, thanks to his work inside and outside the language classroom, he is able to do things with words, to modify and transform a given initial situation to the conditions for achieving what is undoubtedly his central objective: the construction of the "I" in and through discourse.

According to Ballestero and Batista (2014) the didactics of reading comprehension in English should be based on the communicative approach and the process of reading comprehension in a foreign language, namely: Bottom-up interpretation, i.e. the reading comprehension process is guided by the content and formal aspects of the text. In top-down interpretation, the process is driven by the reader's knowledge, experiences and expectations. In interactive interpretation, the reading process is an interaction between the processing to which the text leads and the processing acquired by the reader; it is the interaction between the reader's previous knowledge of content and language and the information offered in the text. For their part, Cisneros-Estupiñan, et al. (2012) consider that a reading intervention proposal can influence a change in the student's schemas to reduce the distance between him and the text. They state that the most ambitious aspect of such a proposal "is the change in the student's vision of the text: from monologic to dialogic, from passive to active, from mechanical operation to reflective interaction" (p. 34).

Villalobos (2020) states that teachers should help students activate prior knowledge and identify syntactic and semantic clues when reading text in English, because activating students' prior knowledge facilitates the making of connections to enable the construction of meaning and make sense of the text. Without ignoring that each reader has his or her own reading strategies that he or she activates according to his or her needs. Laura et al. (2021) state that the use of digital technologies for teaching English requires innovative strategies from the teacher to develop cognitive, reflective and social skills in students. Also, Castro et al., (2019) consider that emerging digital technologies favor inclusive English teaching processes, because they allow a variety of resources that can be adapted to the individual characteristics of students.

On the other hand, Salmerón et al., (2010) and Wan Kassim (2021) emphasize that readers visually read the structure of the page such as, the resources used, the headings, the sections and that they can follow a reading strategy such as a motivation strategy by choosing what they find most interesting and a prominence strategy by choosing the links that appear first. Likewise, Çakıcı (2017) highlights some of the advantages of ICT as valuable tools in teaching and learning English as a foreign language, in that the use of computer, the Internet, cell phones, music players, etc. increase students' motivation and language awareness, give variety of content, contexts and pedagogical methods. Likewise, Mogrovejo et al. (2019) affirm that the use of technological resources from the game improves students' English vocabulary; however, as Bravo Bravo and Alves (2020) state, it is necessary to make curricular adaptations that respond to formative purposes. ICTs make the English teaching environment interactive, flexible and student-centered, provide learning opportunities outside the classroom, make possible a large amount of audiovisual materials and facilitate language practice, and foster students' autonomy as they take responsibility for their own learning. With ICTs, relevant materials can be designed to effectively assess students' achievements in all skills. In the same line, Bacca Bonilla (2018), in a documentary research, from 2010 to 2018, makes a pedagogical reflection about different studies interested in recognizing the importance of learning environments mediated by ICT, in the construction of meaningful strategies for strengthening reading comprehension in English. It found that, in most references, there is evidence of the need to strengthen the learning processes of English as a foreign language.

Meanwhile, Titar-Improgo and Gatcho (2020) state that the increased use of technology has changed the reading landscape. Readers' consumption of hypertext is intensifying as they strive to respond to the

challenges posed by the Covid-19 pandemic, and such a response is fraught with challenges, especially to those who are not used to reading in a hypermedia environment. Hypermedia applications make demands on readers: navigating hypertext, searching for information, filtering out unnecessary data. It is therefore essential that readers have strategies to make the most of the technology and thus make strategic sense of the texts that the Internet provides. They argue that reading in the hypermedia environment involves reading digital texts that differ from printed texts in terms of the strategies involved in information processing and that, although some are valid for both media, others are more restricted to online comprehension. Hypertext, in addition to being similar to linear text, includes links within the material to other documents or points. This characteristic is due to the fact that hypertexts can be examined or explored. Also, when hypertext is combined with audio or video, it can involve varied strategic processing. Readers, then, can transfer their print-based reading skills to hypermedia reading, but they will also need to use additional strategies shaped by the characteristics of the hypermedia environment.

Digital technologies should be fundamental in education, since learning to manage technologies, in which social networks, video games, smartphones and other web services are immersed, are necessary to consult information and to have more tools for intellectual, personal and social development. Technology must be adapted to the specific needs of the environment in which it exercises its function so that its use and appropriation has an impact on the personal and group capabilities of students (Marulanda, et al., 2014; Yudhana, 2021). The use of ICTs and their mediations also have an impact on the possibility of students being more competitive in the labor market. In the pandemic era, education mediated by digital technologies was fundamental, since it was through them that it was possible to keep students in the educational system, thus ensuring their permanence. Therefore, the purpose of this article is to analyze the didactic use of hypermedia texts for the promotion of inferential reading in English in Spanish-speaking students of a public educational institution in the city of Medellin, Colombia, who were in the eleventh grade in the school year 2020, a period that coincides with the time of pandemic caused by Sars-Covid 19..

Materials and Methods

This research was developed from a qualitative approach. The method used was the collective case study. According to Calle Álvarez and Chaverra Fernández (2020), the case study in digital culture allows "to approach the relationship between technology and educational institutions" (p. 33). This in order to improve the curricular programs and therefore the curricula of the institution in question. Thus, in order to find and reveal the complexity of the extrinsic and intrinsic processes of students confronted with the inference of hypermedia texts, the case study was supported by theoretical and empirical descriptions and interpretations linked to the context of the students. The particularity of the group selected for the case study is based on the focus on the process of inference made by the students when confronted with a text in English.

This research was carried out in a public educational institution located in the central-eastern sector of the city of Medellin, Colombia. The student population is characterized by its cultural diversity and some students live in conditions of social vulnerability. The educational institution has a holistic model with a socio-constructivist approach, its objective is the formation of complex thinking based on the experimentation of realities and the solution of questions, it gives importance to inquiry, research and collaborative work, sustained within the framework of inclusion and personal growth of students.

In the English area plan, the teaching and learning of a foreign language is proposed as a process that allows students to access other sources of knowledge, other cultures, other ways of seeing reality and another way of communicating with others, which takes into account their environment and their individual characteristics. The development of the didactic proposal was carried out with five groups of eleven students from a public educational institution in the city of Medellin, Colombia. However, as a case study, five students were selected, one for each group:

a) Student 1 (E1), a student of Software Development Technique, with indigenous origin, but without knowledge of his/her ancestral language, showed interest in learning English and tried to pronounce it well when speaking and reading. The student claimed to have difficulties in written proficiency.
b) Student 2 (E2), a student of Electronics Technology, showed that s/he liked to learn this language and independently was enrolled in a conversational English course on the opposite day. The student expressed a liking for reading books and short stories in English.

c) Student 3 (E3), a student of Multimedia Design and Integration Technique, was trying to put into practice what s/he knew about English; however, he recognized that s/he read little in English. This student was enrolled in an English course on the weekends and his/her love for English stems from his/her dream of traveling around the world.

d) Student 4 (E4), a student of the Natural Resources Technique, showed many difficulties in listening, speaking, writing, and reading in English. This student came from the Atlantic coast, so his/her strong accent made it difficult for him/her to pronounce the words. He/she expressed not liking English for this reason.

e) Student 5 (E5), student of the Humanities technique, showed difficulties in pronunciation, listening and writing, decided to participate because s/he considered that s/he had good reading comprehension, although s/he stated that s/he was doing poorly in the written evaluations.

Five students were selected, seeking to have one representative for each of the technical programs offered by the educational institution. In addition, the students had to have an interest in learning English, not have participated in English immersion programs in other institutions and have a technological device with Internet connection. The phases of the study were:

a) Design of the didactic intervention according to the technical resources available to the students. The purpose of this moment was to build the didactic intervention to motivate inferential reading in eleventh grade students, according to their characteristics, interests and expectations regarding English. The didactic intervention was mediated using the hypermedial system, the morphologies of information were used to design readings taken from authentic texts. The design took into account technical aspects such as color theory, hyperlinked clues that led to inference, as well as didactic aspects such as the use of models to reach reading inference.

b) Implementation of the didactic intervention and follow-up of inferential reading through the application of reading tests. The purpose of this moment was to implement the didactic intervention with groups of eleventh grade students. The didactic intervention was planned as workshops with initiation, practice and evaluation.

c) Evaluation of the didactic intervention, to investigate the didactic possibilities of the use of hypermedia texts for the development of inferential reading in English, from the students' perspective. For this purpose, an electronic survey was used, applied to the five students in the case study, from a Google Drive form. For each reading workshop, the electronic survey was applied and had to be answered together with the respective reading test.

The data collection instruments were the field diary and the electronic survey. Jiménez Chaves (2012), states that the field diary "is classified as a non-systematized recording instrument of a personal nature in which the behavior of the observer's experience or that of other individuals is recorded" (p. 149). The field diary as a research instrument was used to record the dynamics of the students, teacher, and institutional reality in the process of the implementation of the didactic intervention, to favor inferential reading of hypermedia texts in English. Mediation strategies, students' attitudes towards English and actions that demonstrated inferential reading were recorded. On the other hand, at the end of the sessions, the teacher/researcher wrote down the pedagogical reflections on his/her didactic actions and perception of the class. The electronic survey consisted of five questions: two direct questions about the hypermedia resources and the proposed text, and two reflective questions about the reading experience in English and the mediations.

The validity and reliability of the instruments were subjected to expert testing. As stated by Escobar-Pérez and Cuervo-Martínez (2008), expert judgment is a useful validation method to verify the reliability of an investigation, since it is "an informed opinion of people with experience in the subject, who are recognized by others as qualified experts in it, and who can provide information, evidence, judgments and assessments" (p. 29). Experts then eliminate irrelevant aspects, incorporate the important ones or modify those that require it.

To validate the hypermedia resource for the students, we turned to the technology and computer science teacher of the educational institution, who has a master's degree in educational technology. After reviewing each workshop, in his opinion, the elaboration of the five mediated reading workshops in Microsoft PowerPoint as a hypermedia resource in PPSX format (non-editable file) met the requirements of design, functionality and applicability. The same professor validated the surveys applied in Google Drive. He recommended a pilot test to see how the presentations would work on computers and mobile devices, which was carried out and involved improving the layout of some images on the slides so that they could be projected on cell phones. The data analysis was supported by triangulation, as it is a control procedure that guarantees the reliability of the results of an investigation. The results to which triangulation strategies have been applied may show more strength in their interpretation (Donolo, 2009).

Results and Discussion

Five workshops were developed in the five eleventh grade groups, one each week and the free messaging

application WhatsApp was used to send the respective workshops. Prior to the development of the workshops, a meeting was held through the video conference application Google Meet to motivate, present the content and structure of the reading workshops so that students become familiar with the management and exploration of the resource and with the reading of hypermedia texts in English. For the implementation of the reading workshops, the Microsoft PowerPoint program was used to frame the strategies and activities to promote inferential reading. Each reading workshop was supported by an orientation guide. The images that are part of the resource are free to use, without copyrights and were taken from the Pixabay.com community. The interactive resources were designed in virtual platforms that allow the creation of open source multimedia activities such as Thatquiz, Educaplay and Google Drive. The above is consistent with Yudhana's (2021) postulates on the importance of determining the delivery of materials to the students.

Regarding the technical aspects, the strategy used was as follows: each eleventh grade group had its workshop mediated by the WhatsApp application. The resource was sent in a PPSX file format, i.e. an XML slide presentation (open and flexible standard used to store, publish and exchange information) of Microsoft PowerPoint, designed not to be editable and to reproduce the presentation on the computer, cell phone or tablet. As a support strategy for the resolution of each workshop, a short video tutorial was sent along with the file, explaining the procedure for interacting with the resource and providing guidance on how to deal with the different types of readings. The video tutorial was made in Bandicam, a screencast type program that allows recording the screen of the computer, cell phone or tablet. In addition, the students had synchronous support from the teacher/researcher through the WhatsApp application.

In the reading workshops, the pre-reading, reading and post-reading moments were applied. Pre-reading was designed to place the student in the topic and prepare him/her for reading comprehension; practical activities related to previous knowledge were presented. In reading, the text was supported with images, audio and hypertexts as clues to facilitate the inference process because vocabulary activities and identification of ideas were presented. In the post-reading, practice and evaluative activities were proposed with the purpose of strengthening the comprehension process and that the student uses the strategies to infer. For the analysis of the didactic intervention, the starting point was the electronic survey applied to each of the five students, after the development of each of the proposed workshops, and the field diary. It should be noted that the intervention was carried out within the framework of quarantine and social isolation due to COVID-19. Figure 1 summarizes the categories of analysis and their descriptors:

Figure 1. Categories and descriptors

Source: own elaboration
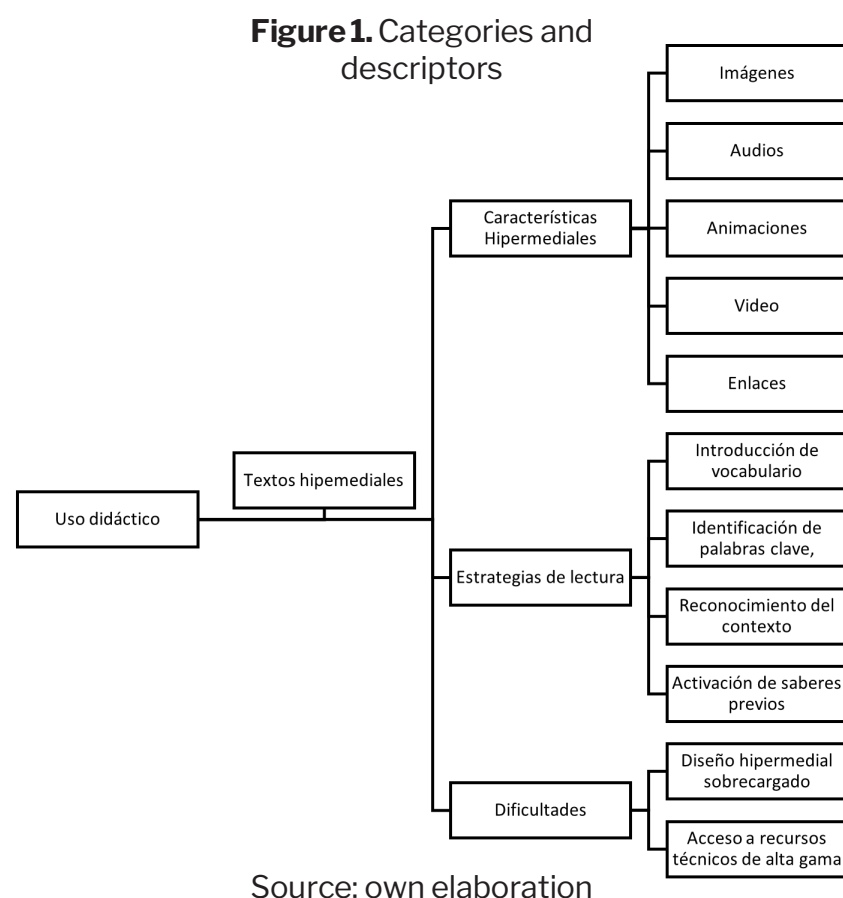
Contributions of Hypermedia Features to Inferential Reading.

Four students (E1, E2, E3 and E5) agreed that the advantages of reading the text in PPT were associated with the ease of reading because of the type, size and color of the letters; the images helped to understand the readings because they were closely related; and it is a different reading than the one done in the textbook. Wan Kassim (2021), states that the combination of letters and still image, are powerful aesthetic aspects that characterize hypermedia and consequently influence reading. Students felt interested in reading the text in a different format, there is motivation and curiosity to see the content of the presentation. The novelty of the resource, which can be viewed both on the computer and on the cell phone, generated a certain expectation to develop the proposed activities. The above, corresponds with the results of the research by Vera, et al., (2019) on the use of multimedia technologies for learning English.

Regarding the audio resources in the texts. students E4 and E5 responded that it helps them to understand in English. On the other hand, students E2 and E3 did not use audio and E1 answered no, because for reading they do not need audio. According to these responses, only for two students the audio would be advantageous; most students do not see the need to listen to the reading in English. In this regard, it was found that multimedia designers often maximize audiovisual features in computer-assisted L2 texts to support lexical bootstrapping and make difficult texts comprehensible (Garrett-Rucks et al., 2014). Probing further with the same students, after the workshop was applied, students E1 and E3 said that they had not used the audio because on their cell phones it did not work for them.

Regarding the animations, all five students agreed that they were appropriate to the reading topic. E1 adds that they captured his attention and made him understand the reading. On the other hand, student E4 considers that they were striking, although they did not contribute to his reading comprehension. The animations in the different workshops were designed as a brief sequence for readers to interact with them, either to display a translation, a practice exercise or for feedback on a quiz. It should not be overlooked that animations in a hypermedia text are an attractive and effective element to capture the user's attention and make them interactively access other sites. Didactically, they are fruitful in learning programs (Wan Kassim, 2021). In the case of the five workshops presented, most of the animations contained the combination of text with non-verbal animation so that students could access the translation of some words by clicking on the highlighted word. According to Mayer's (2005) modality principle, the combination of different sensory modalities of information input enhances learning.

Regarding the videos in the reading, the students responded that, although the videos were very short, they made the reading more interesting and two agreed that some of them did not work for them because they worked on the reading on their cell phones. In workshop 4, specifically, three GIFs of 5 to 10 seconds in length were used. Students assumed that GIFs were short videos. They used GIFs, which are animated images made from the union of several images that follow each other and are played as a video without sound that can be played at will, because the video requires ample space in memory. Garrett-Rucks, et al. (2014) mentions the multimedia principle in which providing students with verbal images (written or spoken) as pictorial (illustrations, photos or videos) should improve students' ability to create coherent mental images in working memory, which would increase learning outcomes. For his part, Irrazabal (2020) says that not all multimedia combinations achieve an improvement in learning and, in some cases, may be detrimental to learning.

An observation that needs to be mentioned, in the use of the resource, is that E1 said that he noticed that when he read one of the texts, on his cell phone, he did it as when he read in the physical book, i.e.: "Follow the reading, pointing with the finger". According to Titar-Improgo and Gatcho (2020), this corresponds to a reading technique to guide the eyes through the screen, which leads to affirm that despite using a technology different from the printed book, readers will often act as if they were in front of the physical book.

On the other hand, E4 said that when s/he faced the practice activity in workshop 5, s/he intentionally clicked on any option so that the same resource would give her/him the correct answer. S/he asserted that, "Teacher, I felt like I was cheating, but it helped me understand the reading a little more and how I should answer on the test." This caused the student to review the reading, going backwards or forwards in the navigation as s/he saw fit. E3, said that s/he thought it was "good that the reading was divided like in parts, because it was long." This segmentation of some readings was done so that a better understanding could be achieved as the student incorporated the information. To E5, it seemed that the readings were full of images very related to the text and that it was very "cool when the drawings appeared". E5 refers to the combination of words and images that appear in the PPT presentation. The expression s/he uses "*bacano*"

indicates motivation towards reading, in this case due to the possibility given by hypermedia to combine the different sensory modalities (Vera, et al., 2019)

This argument gives grounds to affirm that the present research was to the rescue of the technical possibilities of the hypermedia text, not because of the multiple intertextuality links that may or may not deviate the linearity of the reading, but because of the clues that led to the inferential reading of the data extracted from the text. The hypermedial material with which the different readings were approached with the eleventh grade students had a formative character, it was elaborated so that they could strengthen their reading skills, based on didactic parameters that led to an ideal learning process.

Reading Strategies Applied by Students

The main reading strategies proposed in each workshop were: introduction of vocabulary related to each reading, identification of key words (verbs, adjectives, pronouns), recognition of the contextual situation of each reading and activation of previous knowledge.

Regarding the reading experience, E1 expressed that s/he thought it was "good, because it helped me to identify some words". E2: "I thought it was didactic because I had to use the dictionary". E3: "I thought it was very good and practical". E5: "Good, because I learned some words". The activity consisted of opening a virtual dictionary, then, through a link, opening the *Thatquiz* application and writing in English the past tense of a verb, its negative form, or writing in Spanish the meaning of an expression or word. As the case may be, these exploration routes allowed establishing a dialogue between the resources and the student, seeking to maintain the student's interest (Naidu, et al., 2020). Overall, all five students found it practical and motivating. The objective of the pre-reading activities was to familiarize the students with the vocabulary, prepare them for reading, initiate them with the mental representation of the text content, and lead them to inferential comprehension.

Regarding the activities after reading, E1 was helped to understand the reading. E2 said that "I thought the practice activity after reading was cool because it told me if it was correct or not". E3: "The activity after the reading helped me remember the verbs and it was easy". E4 found the activities confusing and E5 found them fun. The main goal of the post-reading activities was for students to practice solving comprehension questions through motivating activities. E3 mentions an intrinsic characteristic of hypermedia and that is the quality of interaction with the resource that gives the user the ability to explore and associate the elements presented (Wan Kassim, 2021). An additional element typical of computer systems is immediacy, to which the student refers when s/he says whether the activity developed by him/her is correct or not. This immediacy in the results is the feedback, which makes the activity proposed in PPT, an exercise that can be repeated several times and is the practice before facing the test.

E4, who states that the practice activities were confusing, is due to the fact that s/he needs constant guidance from the teacher to develop activities such as reading comprehension. When asked why the activity was difficult for him/her, E4 said: "I got a little distracted, because in this activity I did not understand the questions". This caused the student's disinterest in developing the activity, which usually happens when the text is not understood. E4 did not form mental representations from the text read, nor did s/he integrate the information contained in the reading with his previous knowledge (Salmerón, et al., 2005). As a result, the student did not understand the reading comprehension practice activity (Yudhana, 2021).

Regarding the ways of making sense of the texts, the students responded as follows: E1: I tried to identify the ideas that the writer conveys. I found key words that gave me clues to answer. E2: I relied on my knowledge of English. E3: I inferred the answers based on the information in the text. E4: I had to translate to understand and answer. I answered randomly because I did not understand the questions. E5: I found key words that gave me clues to answer. I had to translate to understand and answer.

Students E1, E2 and E3 resorted to identifying key words for comprehension and inference. To this effect, it is worth mentioning that when they refer to key words, they are talking about names, places, actions, words that describe, words similar to Spanish and known words. Some key words in the different texts, were highlighted and were cross-references that when clicking on them, their exact translation is activated so that they can be interpreted correctly, since some lexical knowledge was considered useful and necessary for students to be able to integrate ideas from the text, extract information and infer. In addition, the use of interactive content favors adaptive (Naidu, et al., 2020; Zhao, 2018) and autonomous learning (Koliasa, et al., 2019).

When associating keywords, "the reader forms a network of textual representation of content. It is assumed that the response pattern in the association task corresponds to the activation pattern of this network" (Salmerón, et al., 2005, p. 184). According to Mayer's (2005) signaling principle, in a multimedia presentation, cues are required to enhance learning. Throughout the PPT presentations, the visual modality of the different color of the words or expressions was used to direct the students' attention towards the clues.

On the other hand, E4 did not use the strategy of identifying key words, due to his/her limited command of vocabulary that prevented him/her from constructing a mental representation of the reading, s/he chose not to exhaust himself in the recognition and decoding of the text and answer without making cognitive processes, because his/her reading resources were exhausted, causing low results in his performance. The truth is that when the necessary words are not recognized, comprehension does not occur either (Titar-Improgo and Gatcho, 2020). On the other hand, E4 did not acquire new vocabulary with the proposed pre-reading, reading and post-reading activities, s/he did not make inferences from the context of the reading and the activation of her own prior knowledge did not come into play. According to Yudhana (2021) a component to achieve reading comprehension is a basic mastery of foreign language vocabulary.

Regarding what they need to improve their reading in English, the students responded: E1: "To know more words and know how to put them together". E2: "To know more terms to have an idea of what you are reading". E3: "increase vocabulary". E4: "To learn more English. E5: "Know a lot more about some words to be able to understand texts well". Students 1, 2, 3 and 5 agree in specifically stating that what they need most to understand a reading in English is to know more vocabulary. E4, on the other hand, says that they need to learn more language. As Van Dijk and Kintsch (1983) have already mentioned, reading is not simply identifying letters, recognizing words, and processing discourse; the reader's mental representations of the information, the relationships between the ideas contained in the text and the context of the discourse are involved in this process. These authors say that good readers know how to use the context, they notice almost all the words in the content; on the contrary, poor readers recognize isolated words imprecisely and if contextual clues are absent or misleading, their performance is affected.

One of the objectives of workshop 2 was to use the online dictionary as a resource to support comprehension. A hypertext signals access to the dictionary. By clicking on this hypertext, the student enters new information and it is up to him/her to decide whether to enter or not, or to continue reading the workshop. The use of the dictionary both in the non-virtual and in the hypermedia environment is a support strategy for general comprehension. E2 and E5 made use of the suggested virtual dictionary, because it helped them to understand some words, E1 and E4 did not use it simply because they did not consider it necessary and E3 decided to go to the physical dictionary. There is a strong relationship between vocabulary knowledge and reading comprehension, which is why lexical instruction in the foreign language is necessary. It should be noted, as mentioned by Kulaç and Walters (2016), that readers have several ways of coping with unfamiliar words while reading: they may look up the words in a dictionary, they may guess the meaning from the context, or they may ignore the word. They point out that excessive dictionary use interferes with short-term memory and hinders the comprehension process. To counteract this effect, it is convenient to guide students on the use of the context to understand the meaning of unknown words, in this sense, in reading workshop 2 it is proposed to use the virtual dictionary to look up some words in the reading in order to help comprehension.

Regarding what most caught their attention about the reading in Microsoft PowerPoint, they responded: E1: "That before reading you have to identify words related to the reading and it was like a game". E2: "I liked in this workshop the part where you have to answer questions from the reading and that when you answer wrong the wrong answer changes color. It was like a review for me." E3: "The translations of some words or phrases. The bad thing is that they were not all there". E4: "The activities before and after reading were like games". E5: "There was a practice part where until you didn't answer it I wouldn't let it go.".

The response of E1 has to do with the activation of prior knowledge, where the words or expressions to activate the comprehensive reading were related to the topic of the respective text, which, depending on the workshop, were organized in a number of four to eight so as not to overload the students with information. On some occasions, external tools that could be easily integrated with PPT, such as Thatquiz and Educaplay, were used.

Prior knowledge structures can be supported by activities that form efficient retrieval systems. When reading a text for which there is no knowledge base or when the reader cannot activate his or her prior knowledge simply

"no retrieval schema is established" (Van Dijk &Kintsch, 1983, p. 361). Locating a key word, an expression that accounts for the intrinsic meaning of the text, allows the reader to move towards comprehension, and this can be achieved with frequent exposure to texts. This contributes to a pragmatic teaching of English (Urgilés-Suárez, et al., 2020).

Regarding the reading experience, the students responded: E1: "For me, the reading was very long, so I did not reread, besides, there were many unknown words. But reading in Microsoft PowerPoint was fine for me". E2: "I used seen strategies, such as identifying the key words and my knowledge of English. Also, I had already read the play in Spanish. The rest was good and entertaining." E:3: "It was good because it helped me learn new words". E4: "I didn't do very well. I made a big effort to understand the reading. If I hadn't used the translator I didn't understand a lot of things". E5: "The reading was good". In the students' appraisals, it can be seen that four of them value the process as good, since there are no negative opinions. Other considerations emerge, such as that the reading was long, there were many words unknown to the students, the reading strategies seen in class were applied, and new words were learned. E4, whose evaluation was negative because he did not do well in the reading process, recognizes that he made great efforts to understand the reading and that without the support of the translator he would not have understood the text.

Expressions such as "it was very long reading", can denote several things such as, lack of willingness to read, that the design of the resource did not capture their attention, it was not a topic of their interest. Elements to take into account as inhibitors of comprehension. "I had already read the work" is an opinion that reveals the student's prior knowledge that could have influenced their good performance. "It helped me learn new words," indicates a learning process thanks to the interaction with the hypermedia resource. "I did not do very well", contrary to the previous opinion, this one points out the difficulties with the resource and with the student's own cognitive abilities, which is supported by the same student when he says "I made a great effort to understand the reading".

Difficulties Encountered in the Didactic Intervention

Hypermedia resources facilitate the presentation of information in multiple formats and sensory modalities: text, images, graphics, animations, audio and video. The use of these resources requires a certain mastery of the use of digital technologies. However, when reading hypermedia texts in English, in addition to the reader's technological ability to explore and navigate, it also requires the cognitive ability to establish relationships between concepts, locate ideas, make inferences and activate previous knowledge. In this environment, some problems may arise, which need to be mentioned, as they may directly affect reading comprehension.

Regarding the difficulties encountered in the workshops, the students responded: E1: "I had problems with the reproduction of some videos". E2: "Beyond my capabilities, there was no problem". E3: "The reading was interesting, I learned new things, but it was long and had a lot of things". E4: "Not being able to watch the videos sometimes when working on the cell phone". E5: "I used a translator because the virtual dictionary only translated words and the translator translates more".

E3 says: "it kind of had a lot of stuff". It alludes to the fact that the PPT presentation contained more animations, videos and text than the other readings seen so far. This allusion refers to the design features of the interface. The student perceived a sensory and information overload in the PPT presentation. In this regard, Irrazabal (2020), says that the comprehension of digital text is influenced by traditional or linear text comprehension skills and warns that the inclusion of images and other presentation modalities can help or negatively impact comprehension. In addition, he states that making sense of a text in hypermedia mode requires more information processing: selecting words in hypertext, viewing images and animations, listening to audio, all this to organize, integrate and store information in working memory, can result in an overload, because it exceeds the cognitive capacity of the reader. It is possible that workshop 4, was overloaded with information and that the intentionality of making reading comprehension more meaningful with the support of images, translations and videos, caused a mental overexertion to the students (Vera, et al., 2019; Koliasa, et al., 2021), although, on the other hand, the students stated that it was the workshop that most caught their attention.

One student says that he did not use the suggested virtual dictionary, but instead used the translator "because it translates more". This situation, rather than a problem, indicates a preference when using external tools to understand the meaning of a text written in a foreign language. The preference is because the dictionary (whether virtual or physical) shows the information of isolated words, while the translator presents the translation of fragments or longer texts. It would be necessary to see if the limitations of little lexicon, makes them use the translator more, without looking for other elements such as their previous knowledge or the ability to deduce meanings using the context.

Problems when reading a hypermedia text in English can arise from the design of the resource as such, which may be saturated with visual or auditory elements, generating cognitive overload and consequently interfering with the students' ability to focus on important information, form mental images, process and retain what they have just read. From the technical point of view, if the student does not have a computer capable of storing and reproducing the information contained in the PPT presentation, it can cause demotivation, not developing efficiently the proposed tasks and hindering the promotion of reading in the foreign language.

Conclusions

The didactic factors that favored the inference of hypermedia texts in English were: the organization and structure of each workshop, which contained a step-by-step explanation of what the student had to do. The reading strategy, which was based on pre-reading activities, which simulated games; reading, fed by hypertext, images, audio, animations and very short videos; and post-reading, which contained a comprehension practice activity and the evaluative test, to activate previous knowledge, immerse the students in the reading, guide them to the inference with short and simple practice activities to end with the resolution of the respective reading comprehension test.

The problems that arose with the interaction of the five hypermedia reading workshops in English in Microsoft PowerPoint presentation were related to the design of the resources in view of the fact that some students felt that they had to develop many activities or that there were many things to do. The students' opinions are important for the creation and design of content, in this case of the hypermedia material, which should not generate cognitive overload in the students, but rather should favor the integration of new learning with the knowledge that the student already has. Other problems that arose had to do with the type of device used: cell phones with low storage capacity that, on some occasions, did not allow students to open resources such as the audio, the online dictionary or the videos.

The conditions for improving students' inferential reading throughout the research were the exposure to various readings of texts in English, the selection and organization of the topics of the readings. It was not only a matter of increasing the lexicon, but of following a process towards the discovery of the clues left in the texts to find the answers to the questions of the different tests. An attempt was made to reduce as much as possible the random answers, those that do not lead to processing because, due to ignorance or confusion, they do not allow the student to carry out mental processes, but which were present to warn that more experiences and reading strategies are required for the students.

When describing how the inferential reading process is produced in English, through a didactic intervention based on hypermedia texts, in a collective case study with eleventh grade students, the perception of the participants is that reading hypermedia texts in English is motivating, allows them to have another alternative to reading physical texts and that, with adequate training, they can improve their levels of inferential comprehension. In addition, in the intervention, the students realized that the process of inference requires a series of interrelated skills such as mastery of the English lexicon, knowledge of the topic, and the establishment of relationships between ideas, in order to discover the implicit messages in the texts. Accordingly, it can be affirmed that it is convenient to expose students to texts of different types, length and format in English, in order to improve their performance.

The design of the hypermedia content embedded in the Microsoft PowerPoint resource should be dynamic, simple and meaningful, as well as balanced in the use of images, audios, animations, videos and other sensory elements, so that the interface becomes a reading scenario and does not disperse attention, generate cognitive overload to the student or threaten reading comprehension. Finally, derived from this study, it is recommended to investigate the students' dependence on online translators and how advantageous their use is for learning and retaining English lexis, as well as the implications of their use when solving reading inference problems.

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