

ARTÍCULO DE INVESTIGACIÓN

Affecting Reading Comprehension through ICTs in Question-Answer Relationship in EFL classroom

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Abstract

Reading comprehension plays a transcendent role in language learning. Previous research has highlighted the importance of reading strategies and how students must be trained in how to apply them in order to improve reading comprehension. However, little attention has been given to the use of question-answer relationships (QAR) strategy combined with information and communication technologies (ICTs). The present qualitative action research study used a teacher's journal, surveys, and a multiple-choice test to collect data on the impact of QAR and ICTs on reading comprehension of students in a Colombian public school. Data were analyzed using the grounded theory approach. Results indicated that students improved their reading comprehension skills through reading strategies, and collaborative learning while in-class; however, test scores did not change. This lends support to the notion that QAR and ICTs is an effective approach to reading comprehension, in which case it should be more widely adopted by the reading programs at institutions.

Keywords: *ICTs, Question-Answer Relationships, reading comprehension.*

Introduction

Reading skill has been studied for long, and one of the goals for a teacher is that students achieve the complete understanding of the texts given. In the pursuit of this

understanding, the role of the teacher is to train students to reach higher levels of thinking. What refers to this study, facing reading comprehension should advance from literal comprehension towards higher levels, according to both Bloom's and Barret's taxonomies (Barret, 1976; Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, 1956) which include levels such as literal comprehension, reorganization of information, inferential comprehension and analysis, and evaluation to ultimately create their own ideas based on their appreciation and reflections upon the readings. Students struggle with reading mainly because of the lack of vocabulary, identification of grammar structures, and the shallow analysis proposed to them in comprehension questions. Therefore, students need to be exposed to meaningful readings more often. In other words, topics in the readings that students are familiarized with, that relate to their lives.

Public education in Colombia has a negatively significant difference with private education regarding quality. Most of public-school students are part of low-income families and, by the end of their high school studies, instead of enrolling in higher ones, they start working (OCDE, 2014). This current study pretended to positively affect reading comprehension and offer a possibility to deal with low levels in this skill with eleventh graders at a public school in South-East Bogota.

Because of the lack of studies about the use of QARs and the effect on reading comprehension in Colombia, this study intended to find the impact of such strategy combined with ICT on low levels of reading comprehension.

Provided levels of reading comprehension rise, this study would be an opportunity to further implement it on a national scale, contributing on reading comprehension

development in EFL. In that sense, many of the schools in public and private sector in Colombia which go after raising levels and pursuing a higher position in Colombian school ranks (Revista Semana, 2015) would be benefitted.

This research used Question-Answer Relationships as the core strategy to conduct the investigation; this is owing to the significant positive results shown in comparison to other strategies for reading comprehension (Hemmati & Bemani, 2013; Raphael & Au, 2005).

Moreover, this study intended to support QAR with ICT in order to improve reading comprehension. Within ICT, there are several tools that not only help reading comprehension, but also foster students' critical thinking, and autonomy (López, 2006), and it does have more arguments in favor than against (Yunus, Nordin, Salehi, Sun, & Embi, 2013). So, the objective is to focus on interactive reading exercises: meaningful short texts for students' lives. Bearing this in mind, reading sessions were allotted two hours a week (that means half of students' English class time). In those sessions, the teacher-researcher used short authentic texts in electronic resources in which students not only had to answer both closed and open questions, but also made connections between the text and their own lives. Also, some texts were given in Google Docs, an online word processor that allows the participation of real time group work. In that sense, students could participate online. Such participation was sent to another classmate through e-mail as a digital resource.

It is necessary to see reading no longer as a passive skill, but as an active mental process which needs improvement, and training (Gao, 2013; Hemmati & Bemani, 2013). Considering theories about reading, the top-bottom view has close relation to what

“schema” theory is: the connection between the text and the knowledge of the world the reader has (An, 2013). In such a theory, reading is always intertwined with the reader’s background knowledge. In order for students to reach higher levels of thinking, it is necessary to provide them with reading strategies they can use to face reading from different perspectives and eventually improve this skill (McNamara, 2007). Among the existing reading strategies, Raphael (Raphael, 1982) elaborated the question-answer relationship strategy, which combined with information and communication technologies (ICTs) for reading comprehension could be an opportunity to provide students with enough tools to understand texts fully. QAR provides a rather simple taxonomy and structure to guide readers in how to approach distinct types of comprehension questions, thus achieving better understanding of texts. consists in identifying specific types of questions in relation to any given text and the diverse ways to answer those questions.

Raphael (1986) poses two general categories for questions “In the Book” and “In my head”, which are equally subdivided into two subcategories each. “In the Book” type of questions, these ones are explicit within the text; this category subdivides in “Right There” and “Think and Search” questions. The former requires local comprehension of the text; that is, looking for specific information in a specific part of the text; that is, when the teacher plans the question exact words are used from a specific sentence of the text and the same applies at the moment of answering. In contrast, the latter demands a more global comprehension of the text, that means that it will be necessary to make connections across the text, summarize and even make simple inferences. “In my Head” types of questions are also subdivided in two categories: “Author and me”, which require interrelations between

what the text says and what the reader previously knows, it also demands to make inferences along the text of what the author's stance is according to the techniques he uses throughout the text, and even predict future events in the reading. Additionally, the second subcategory is "On my Own" which are questions that although do not require a full reading of the text, they need the use of background knowledge to refer to the topic of the text and connect with firsthand experiences.

As defined by Graesser (cited in McNamara, 2007) "a reading comprehension strategy is a cognitive or behavioral action that is enacted under particular contextual conditions, with the goal of improving some aspect of comprehension." (p. 7). Moreover, as noticed by the National Reading Panel (cited in Stafford, 2012) in the USA, strategies should be included in reading instruction.

Reading strategies should be provided to students in order to improve their understanding. Studies conducted regarding training and use of reading strategies and QAR (Green, 2016; Hemmati & Bemani, 2013; Izquierdo Castillo & Jiménez Bonilla, 2014; Kamil et al., 2008; Muzammil, 2017) showed that students increase their comprehension and overall skills in reading, even in young learners (Cortese, 2003; Gutierrez & Salmerón, 2012; Kinniburgh & Prew, 2010; Ouzts, 1998) because QAR fosters foundations for reading comprehension by going from basic to complex comprehension thinking levels. That implies that it is suggested for a teacher to provide students with enough strategies for them to select and apply so as to better understand texts.

Moreover, not only has QAR proved to be effective in basic reading comprehension, but also promotes scientific thought in specific content areas, such as math,

chemistry, and social sciences (Benito, Foley, Craig, & Prescott, 1993; Cummins, Streiff, & Ceprano, 2012; Kinniburgh & Baxter, 2012; Kinniburgh & Shaw, 2009; Pappa & Tsapalis, 2011). Nevertheless, not all the time has QAR been effective (Lizcano, 2015; Stafford, 2012) when proper training is not given to students within a period of time between 3 to 4 months.

Considering ICTs in education, it is necessary to bear in mind that technology is a means to an end, and ICT tools have been considered as an aid for reading comprehension (Coiro & Dobler, 2007; Mária et al., 2016; Rinji & Ohiare, 2017; Sarab, Al-Shihi, & Hussain Rehman, 2013).

In Colombia, although several studies have been conducted about reading comprehension and the impact of reading strategies including the use of technology in class (Izquierdo Castillo & Jiménez Bonilla, 2014; Jimenez Pulido, 2009; Lizcano, 2015; Poole, 2009; Roa Pinzón, 2014), little has been researched in respect to QARs and reading comprehension in either ELT or another content area (Echeverri Acosta & McNulty Ferri, 2010).

Given the importance of reading comprehension strategies, and the need to conduct more studies within Colombia's context, this study tackled the need to provide more information about the effects of QAR and ICT tools on reading comprehension in Spanish native speakers EFL students. The question that arises, and will direct this research is: How does the use of question-answer relationship activities combined with ICT tools affect reading comprehension in A1 (CEFR) eleventh graders at a public school in South-East Bogota?

Aiming towards obtaining positive results, this study sought to identify the extent, in which QARs, supported by ICT could improve reading comprehension to higher levels. In that sense, this study intended to raise awareness on the importance of the use of reading strategies, and to foster the proper use of ICT in reading comprehension.

Context and participants

The present qualitative action research entailed that the researcher looked at variables, and collected data in the natural setting while attempting to interpret issues or questions based on the points of view of the researcher and the participants (Denzin & Lincoln, 2011). Additionally, there was a “problematic” situation that arose after some reflective practice that needed to be critically questioned so as to bring about changes, through a continuous cycle of plan, action, observation, and reflection (Burns, 2010). Taking those characteristics into consideration, this study was as practical, reflective, analytical, and descriptive as a qualitative action research denotes.

This study was conducted in a public school located in the South-Eastern area of Bogotá. This school created its syllabus for English as a subject of study based upon the idea of training students for the national test SABER 11. This test measures students’ competence in different academic areas of knowledge SABER 11 test scores. Added to the basic areas of knowledge (natural sciences, language, and math) assessed in SABER 11, competence in a foreign language is also assessed considering CEFR levels of performance (Instituto Colombiano para el Fomento de la Educación Superior [ICFES], 2016). Based on 2015’s SABER 11 test scores, students were placed in A1 level (CEFR) in overall English

(see Appendix A). Based on what the national test entails, the school's syllabus focused on training students mainly in grammar aspects.

It is relevant to mention the fact that the school only hosts the two last grades of high school since this can somehow impact the students' performance. Most students come from different schools and that implies different English levels, differences in knowledge background, as well as learning styles, and that once again may affect students' performance in English tests.

The participants of this study were a group of 31 students in their last school year. Students' age ranged from 15 to 19 years old, and the group had a heterogeneous level of English. Very few participants could afford an EFL education in private institutions because of their socioeconomic status (SES). Most of the participants were from low-income families and even escaping from rural areas because of the internal firearm conflict of the country.

Based on Colombian Basic Standards of Competence (Ministerio de Educación Nacional, 2006), eleventh-graders should have a B1 level in English when they finish their high school studies (see Appendix B). Given that, it was not necessary to make participants improve their English level.

Data collection instruments

For this study, the data collection instruments were designed to gather information on the participants' and researcher's perceptions in regard to the application of QAR and ICTs to foster reading skill in a critical way. Also, to collect data on the value of the

strategy and tool selected towards improvement in reading comprehension. Therefore, surveys, teacher's journal, and texts, reading comprehension questions and multiple-choice test as artifacts were selected. The latter helped to measure students' reading comprehension levels as a pre-test and post-test of the implementation.

Dörnyei described three types of information that can be gathered through surveys: factual, behavioral, and attitudinal (cited in Burns, 2010). For this study, surveys helped to collect attitudinal information, which consider teachers' and learners' opinions, beliefs or interests. For this study, short surveys were applied after every lesson planned to two different students every time in order to see their perceptions of the methodology used. The idea was to avoid biased information by handing out the short surveys to different students each lesson (a total of 10 lessons were applied for this study). Such surveys contained Likert scales to guide students and open-ended questions to let the participants write their thoughts (see Appendix C).

Similar in some aspects to field notes, the teacher's journal was designed to record reflective information based on descriptive observations during the implementation (Emerson, Fretz, & Shaw, 2011). This was since field notes also included reflective information, which referred to insights, questions, and concerns while the researcher observed. The teacher's journal kept record on classroom experiences that occurred during observation to do after-class reflections (Lysaker & Thompson, 2013). Therefore, the teacher's journal included reflections on specific information gathered during the implementation (see Appendix D).

Finally, for this study the researcher provided texts, reading comprehension questions, and multiple-choice tests as artifacts (see Appendix E). This research instrument portrayed reading comprehension progress through efficient scoring (Bensoussan & Ramraz, 1984; Hammerly & Colhoun, 1984). This study used a multiple-choice test before the pedagogical implementation as a pre- and post-test of the reading comprehension level of the participant before and after the implementation to compare whether there was any change in reading comprehension.

Pedagogical intervention

The implementation of this study took place from mid-September to late October throughout a 5-week period of 10 face-to-face sessions (2 hours each) with the participants. The first two lessons (first week of implementation) were planned for training. The first lesson was the basic training on the terminology, and everything related to QARs for students to identify types of questions and reading skills needed to tackle the questions, in addition to that, a reading practice for students to relate comprehension questions to QARs. The second lesson was the basic training on the inclusion of ICTs for academic purposes. The main objective was to raise students' awareness of the use of technology to share information for the completion of a task. Students had some background knowledge on some ICT, but not on Padlet. For that reason, the teacher did a demonstration on how to use the online tool.

The rest of the lessons were set into two sessions per lesson planned. Therefore, each lesson plan included descriptions of the activities for both sessions: the first session

included activities to practice reading strategies and foster reading comprehension skills through QAR strategy; the second session was especially guided towards a final digital product that was related to the content of the reading worked throughout the two sessions (see Appendix F). To design the final product, the participants had to have previous comprehension of the texts worked during the lesson (two sessions) in order to cope with the requirements.

The implementation was planned through adapting the In-service Certificate of English Language Teaching (ICELT) lesson plan form in a simpler way. Every QAR-focused session (first session in each lesson) started with pre-reading stages that helped activate the participants' previous knowledge. Additionally, the participants faced the texts bearing in mind several reading comprehension questions that moved through comprehension skills according to QAR, from scanning to prediction, inference, and linking text information with personal experience, for instance. In the case of ICT-focused sessions, recalling information and the inclusion of real-life situation topics were the common aspect. The topic of the texts used in the first session were used as the basis for the second session, ICT session. In that sense, the main ideas of the texts in first sessions were included in the second sessions to foster discussions among students by designing digital campaigns.

Collaborative work and autonomy were fundamental throughout the implementation since the participants had to act in different learning situations (Holec & Council of Europe, 1981), and they were fully responsible for their products in and out of the classroom as suggested by Chan (2000).

Table 1. Timeline of the pedagogical intervention.

WEEK	STAGE	OBJECTIVE	ACTIVITY	TIME	Data Collection Instrument
1 (September 20 th -21 st)	Session One: Training on QAR.	Students will be able to identify and answer different types of reading comprehension questions through the Question-Answer Relationship taxonomy.	Students will be trained on QAR taxonomy and terminology. Through a text, they will check their QAR understanding.	2 hours	Teacher's Journal Survey
	Session Two: Training on ICTs	Students will be able to use some ICT tools to approach reading texts to improve their comprehension in academic contexts.	Students will be trained on Google Docs and Padlet as tools to foster collaborative work online.	2 hours	
2 (September 27 th – 28 th)	Session One: Practicing “In the Book” types of questions.	Students will be able to discriminate main and secondary ideas by classifying them through ICT tools in order to promote an event through a digital campaign.	Students will discriminate between main and secondary ideas of a text. They will create a possible ending to the text and provide peer-feedback for such task.	2 hours	Teacher's Journal Survey
	Session Two: Using ICTs in ideas of a text for a digital campaign.		Students will be trained in poster design and they will make a digital poster campaign based on the second part of the text.	2 hours	
3 (October 4 th – 5 th)	Session One: Practicing “In my Head” types of questions.	Students will be able to synthesize information through mind maps and promote peace through websites.	Students will classify vocabulary and answer inferential questions based on real-life situations.	2 hours	Teacher's Journal Survey
	Session Two: Using ICTs for higher order thinking skills.		Students will make a mind map using bubbl.us about an online text and post it on their own wix.com website.	2 hours	
4 (October 18 th – 19 th)	Session One: Applying all types of QAR questions.	To foster autonomy by providing tools for students to freely select which ones to use in reading comprehension exercises and digital campaigns.	Students will share information through online docs, summarize a text and based on the information propose questions and answers online.	2 hours	Teacher's Journal Survey
	Session Two: ICTs and autonomy		Students will design their own QAR-type questions and then elaborate a non-smoking digital campaign.	2 hours	
5 (October 25 th – 26 th)	Session One: Students' autonomy in QAR and reading comprehension skills	Students will be able to make predictions and propose new ideas about a specific topic by reading a text and using ICT tools.	Students will synthesize information and post it on their websites with a question on their blog based on their real-life situation.	2 hours	Teacher's Journal Survey Multiple-choice Test
	Session Two: Students' autonomy in ICT tools to improve reading comprehension.		Multiple-choice post-test	2 hours	

Data analysis and findings

To confirm data validity, two techniques were applied: triangulation within the three instruments, and peer-revision. The data collected was treated constantly to ensure that there was necessary information to answer the research question (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Moreover, the data analysis was presented three times during an action research seminar to peers who provided feedback that ensured the reliability of the information.

The analysis of the data collected in this study was carried out bearing in mind the principles of grounded theory (Corbin & Strauss, 2015). The nature and purpose of this study also required grounded theory since there is not a specific theory that addresses the research question. The ideal development of grounded theory is to analyze data as soon as it is gathered to generate ‘theoretical samplings’ (Corbin & Strauss, 2015). However, the coding process in this study started after all data were collected because of the other groups and classes in charge of the teacher researcher. Having the data visually accessible, open coding initiated by separating data into smaller manageable analytical pieces in a matrix on excel sheets. Then, with data separated in a matrix, color coding procedures helped to highlight and differentiate pieces of information that had some relation among them. The total of answers analyzed were 120. The initial codes that emerged during open coding process are displayed in table 2. Such codes were grouped based on the common answers provided, that is, “implementation of QAR with the highest number of repetitions, followed by ICT tools most used, implementation of ICT tools, effective aspects in reading comprehension, and difficulties and suggestions.

Table 2. Open coding: initial codes.

Research Question	Initial Codes
How does the use of question-answer relationship activities combined with ICT tools affect reading comprehension skills in A1 (CEFR) eleventh graders at a public school in South-East Bogota?	Implementation of QAR
	Reading strategies most used
	Effective aspects on reading comprehension
	Effectiveness of collaborative learning
	Students' participation in class
	Students' interactions
	Students' attitude in class
	Teacher's monitor students' performance
	Teacher-student relation
	ICT tools most used
	Implementation of ICT tools
	Students' comprehension through ICTs
	L1 interference
	Difficulties and suggestions

The second stage in the analysis consisted on comparing and contrasting the codes that emerged; hence, the possibility to group codes together in broader concepts or categories. In that sense, initial codes were grouped as indicated in table 3. It is to note that the two emergent codes “*L1 interference*” and “*difficulties and suggestions*” were finally integrated in both categories based on what the analysis showed.

Table 3. Comparative Analysis: Axial Coding

Emergent categories	Codes
Influencing aspects in reading comprehension skills	Implementation of QAR Reading strategies most used Effective aspects in reading comprehension Effectiveness of collaborative learning Students' participation in class Students' interactions Students' attitude in class Teachers' monitor on students' performance
Students' reading comprehension and ICT relationship	ICT tools most used Implementation of ICT tools Students' comprehension through ICT ICT use drawback

Finally, as part of the axial coding process, a category mapping was designed which held the possible theory to come based on the emergent coding from data analysis.

Based on the mapping, two prominent categories emerged: *influencing aspects in reading comprehension skills*, and *students' reading comprehension and ICTs relationship*.

Regarding the first category, students reported to have improved their reading comprehension in class because of several aspects. One of them was the use of reading topics related to students' socio-cultural background. In that way, students felt more familiarized with the topics, which reduced students' anxiety, and ultimately led to better comprehension. Having background knowledge about the reading topics also entailed familiar vocabulary.

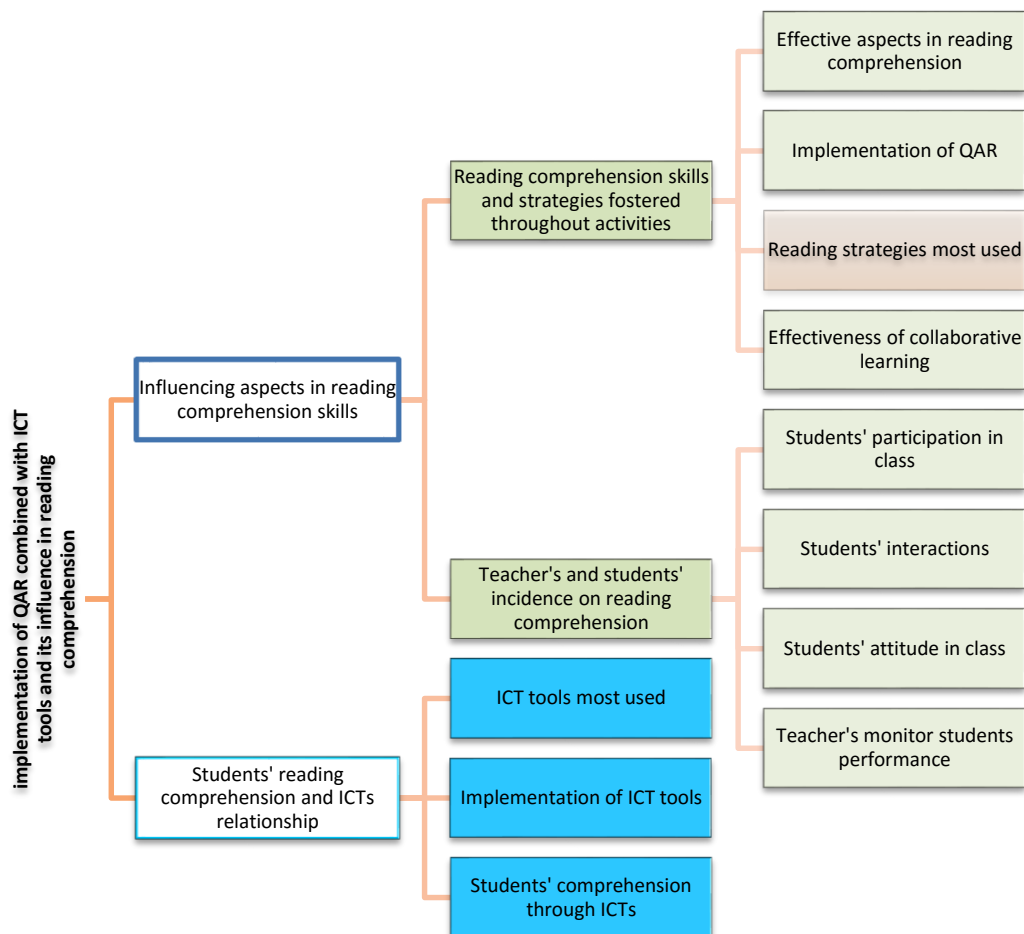


Figure 1. Data analysis mapping.

Although students' English level was A1, they could recognize some vocabulary words during pre- and while-reading activities.

Table 4. Answers provided by students highlighting vocabulary.

Question: Based on this week's lessons, how would you grade your experience with reading in the English class?	Answers
S1	A little better because we have more vocabulary and special terms.
S2	When the teacher makes us read daily-life texts, I realized that my vocabulary has improved even though this subject is hard for me.
S10	Very much useful. I have learned words I hadn't heard and also learnt to analyze a text.
S11	The moments when the teacher gives us new vocabulary and pronunciation.
S17	Does not register.
S19	When we learn vocabulary that helps us with the readings and what we can do with the topics of the readings.

Additionally, students were trained in reading skills and reading strategies within the activities they were asked to do. The salient strategy used in this study was the question-answer relationship. Students regarded question identification as being of good use, and throughout the pedagogical intervention, they recalled QAR taxonomy straightforwardly that having at hand the type of answer that the question requires helped to find the answer quicker. Apart from QAR students developed, they made use of other reading strategies such as visual aids, and mind maps that helped them as metacognitive strategies to activate their reading skills for better comprehension (Praveen & Rajan, 2013) as show in the students' perception samples in table 5.

Table 5. Comparison between teacher's and students' perception regarding reading strategies used.

Teacher's journal	Short surveys
The vocabulary taught was crucial to help students save time in the reading. Images used helped as a metacognitive strategy (journal 3).	We have visual aids and a brief introduction to the topic before being exposed. This help us to understand certain points better (S10).
Sum up the text with free strategy. Pair groups used mind maps with very concrete information. Specific details were omitted, but the general information was grasped and showed understanding of the text (journal 7).	...the lessons have been fruitful because of the topics tackled and the Dynamic used to develop the lessons because we use mind maps, blogs, and we read texts (S1).

Finally, although the focus of this study was on the effect of QAR on reading comprehension, during data analysis traces of collaborative learning emerged as remarkable support for students in their reading comprehension. Owing to vocabulary sharing, reading topics that led to discussions, and mind map design, students had the opportunity to have pair work, group work, and student-teacher interactions to build understanding and knowledge among them. Students interaction was also a major aspect that helped in their reading comprehension. Most of the activities opened with pair work and closed with group work or socialization since “group work provides L2 learners with more opportunities to use the target language and for a greater range of functions in low-anxiety contexts” (Storch, 2001).

Despite the positive aspects, there were several difficulties, and suggestions made by students that may have hindered positive results in this study. The most salient difficulty was time constraints. Another negative aspect that students identified was the length of

readings, and activities. Although engaging, the recurrent suggestion was to have shorter readings and activities because there was not enough time to go through them thoroughly.

Regarding the second category, data analysis also showed the relevant role of ICT tools in students' reading comprehension. It is important to note that technological tools encourage students to rely on themselves as builders of their own knowledge, foster critical thinking through the selection of information, and promote autonomy (López, 2006). Findings suggested that the ICT tools used during the intervention engaged students in the activities, especially in the final products that they had to present after every lesson. On that regard, S19 mentioned that the way in which they had used the reading topics to design poster campaigns or make us think, such as ministries of education, or the cigarette campaign. Students found useful the use of technology to learn vocabulary (table 5). This activity was done during pre-reading stages through Google Docs and the aid of online dictionaries. Additionally, findings suggest that ICT tools not only helped with vocabulary, but also fostered students' participation in class, collaborative work, and overall reading comprehension (Marzban, 2011). Post-reading activities, such as digital poster design, and blog posts entailed students' comprehension of texts, and decision-making, for instance.

Table 6. Students' perception regarding ICT tools to understand vocabulary

S2	With respect to the English class, I think it is interesting because it is dynamic. The teacher uses many resources like games, interesting texts, the use of the internet to learn vocabulary and make the class fruitful.
S11	The activities to learn vocabulary and the use of the computer to find new ways to solve the activities.
S19	I like the way in which we grasp the necessary vocabulary among all of us with computers. In that way, we understand the readings better.

Finally, as a major drawback, students did not have the chance to use any kind of ICT tool to tackle the reading for the multiple-choice test. That fact resulted into negative results especially in question 2, and 8 of the test, which required identification of vocabulary. In other words, students had gotten used to having at hand technological tools that would help them go through readings.

Reading skills and QAR caterogy		# correct
Q1	summarizing / making inferences (think and search)	8
Q2	making inferences (think and search)	1
Q3	scanning / looking for key words (right there)	14
Q4	looking for important information (think and search)	6
Q5	Making inferences / think about main idea (author and me)	7
Q6	Summarizing / making inferences about related details (think and search - author and me)	6
Q7	Predicting (author and me)	9
Q8	scanning / looking for key words (right there)	8
Reading skills and QAR caterogy		# correct
Q1	summarizing / making inferences (think and search)	11
Q2	making inferences (think and search)	0
Q3	scanning / looking for key words (right there)	17
Q4	looking for important information (think and search)	7
Q5	Making inferences / think about main idea (author and me)	8
Q6	Summarizing / making inferences about related details (think and search - author and me)	8
Q7	Predicting (author and me)	11
Q8	scanning / looking for key words (right there)	8

Figure 2. Comparison pre- and post-test

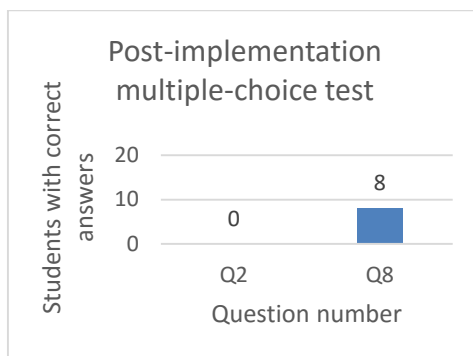


Figure 3. Number of correct answers in questions 2 and 8.

The final step in grounded theory is selective coding which is to integrate all categories into a determining category that delimits theory (Hallberg, 2006). For this study, the core category was *the implementation of QAR combined with ICT tools and its impact in reading comprehension*. Based on the findings of data analysis, QAR strategy plus ICT tools proved to have a positive and negative impact on students' reading comprehension. In-class activities are the most adequate moments for students to use the strategy; however, when dealing with a multiple-choice test, students may not make use of the strategy proposed because of the impossibility to use ICT tools.

Discussion

Since there are no previous studies that had merged both QAR and ICTs, each component in this study was compared separately with previous studies' results. As for reading strategies, regardless of the size of the class, it is an important aspect to foster in students. This study has referred to the implementation of QAR and ICTs; and, teachers must train students in different reading strategies for efficient reading (Rojas, 2001).

In regard to QAR strategy, findings in this study confirmed its positive incidence in students' reading comprehension as it had been demonstrated in previous studies (Echeverri Acosta & McNulty Ferri, 2010; Green, 2016; Hemmati & Bemani, 2013; Izquierdo Castillo & Jiménez Bonilla, 2014; Muzammil, 2017). Students were more engaged in the reading topics and regarded as useful the fact that they could classify and address questions more effectively. In that sense, as Raphael (Raphael, 1986) suggested, this strategy fostered students' lower and higher order reading comprehension skills. Students had to read texts that were close to their socio-cultural background, which made reading more meaningful (Ríos Olaya & Valcárcel Goyeneche, 2005).

Moreover, considering ICT tools, this study has also confirmed the effectiveness of including technological tools as support to improve reading comprehension, similar to what studies in Colombia have shown (Izquierdo Castillo & Jiménez Bonilla, 2014; Jimenez Pulido, 2009; Poole, 2009; Roa Pinzón, 2014). Collaborative work appeared as an emergent key aspect in developing reading comprehension while implementing ICTs, as mentioned by Marzban (2011), and Vargas and Abouchaar (2001).

It is key to say that one of the objectives of this study has been to raise reading comprehension levels. Nevertheless, such objective was not completely reached. Findings demonstrated that the strategy was useful with in-class activities. However, when students tackled the reading test, the overall result was below passing scores, as Lizcano (2015) and Stafford (Stafford, 2012) had shown. That goes in contrast with the studies aforementioned which regarded the strategy as really useful.

This study provided evidence of the importance of training students in different reading strategies that enhance reading skills. The fact that QAR strategy did not transcend to higher test scores was outshined by the impact that it had during the pedagogical intervention. Findings suggest that QAR should be implemented in reading lessons because of the underlying subskills that it fosters. Ranging from lower to higher order of thinking, according to Barret's taxonomy (1976), QAR taxonomy considers the "literal comprehension" level, and moves towards "appreciation". With those levels in mind, findings showed that students recurred to reading skills such as scanning for specific information or predicting what was to happen based on reading part of a text. Moreover, findings in this study demonstrated that as long as students find reading meaningful for them, they can make valuable judgments about the topics involved, which is the highest level of thinking.

Also, the implementation of ICT tools fostered additional reading strategies such as using scanning for specific information like in the vocabulary list in google docs, for instance. Findings suggest that students found useful the fact that they shared information in common accessible locations. Furthermore, mind mapping also fostered students' critical thinking and teamwork skills so as to organize information, summarize it, and then make use of that information in poster or blog design. This study also demonstrated that technological tools cannot be reduced to online dictionaries or online activities. For instance, when readings had a direct connection with their socio-cultural background, awareness, and prevention campaigns helped to raise students' participation, triggered their creativity, fostered collaborative work, increased disciplined since they had to concentrate

on a double task: answering comprehension questions, and the design of a digital product about certain reading topics. Finally, the aforementioned aspects resulted in promoting autonomous learning because students had independent answers to “On my Own” types of questions which were shown through blog posts.

Recommendations

This study has shown the relevance of QAR combined with ICTs to impact students’ reading comprehension. However, findings in the reading comprehension test demonstrated that the content of the reading that students should face must be meaningful for them. In other words, students must have background knowledge about the topic in order to be familiarized and tackle comprehension questions efficiently. Even when students know the type of question they face, reading comprehension tests must be carefully designed lest students feel frustrated by the lack of knowledge of a topic, or vocabulary. Additionally, findings showed that QAR strategy requires the development of several reading subskills. In that sense, students must be aware of such skills needed to answer certain questions and, however beneficial to go beyond lower levels of thinking, training those skills entails time.

Moreover, although the combination of ICT tools with question-answer identification proved to be effective, students’ dependence on them must be controlled. There must be a balance between reading, comprehension check, and technology use. Students were eager to use technology, but the focus on vocabulary acquisition and reading comprehension should not blur because ICT tools are meant for acquiring or building

knowledge, rather than entertain (López, 2006). Otherwise, when there is no technology available, students will have little knowledge of what to do.

Limitations

During the pedagogical intervention, several issues appeared that had an impact on the research. Firstly, the lack of research studies on QAR in Latin America had direct incidence in the instructional design. There were few ideas about what types of activities to design to the participants of this study to apply QAR properly. In the end, the researcher guided himself through the most common ICT tools, and meaningful readings.

Another major aspect was time. A lot of time was devoted to instructional design, and data collection instruments. When the moment of pedagogical intervention arrived, there was little time to cope with the school's calendar, activities planned, and application of the QAR strategy. Similar to Stafford (2012) limitation, time is essential for the proper training and implementation of QAR. Also, the ideal grounded theory based on theoretical sampling (Corbin & Strauss, 2015) could not be done. Data were collected first, and then analyzed.

Another aspect that had direct incidence was the fact that the participants were part of academic studies as well as technical ones with a higher studies institution. They had to present blueprints as their project to graduate as technicians; consequently, sometimes they arrived tired to lessons and some of them felt reluctant to participate, as stated in the short surveys (Appendix L).

Finally, this study was based upon ICT tools and the use of computers was obvious. However, the number of laptops available were insufficient for each participant. That is

why students were set one pair per laptop. In the end, it is remarkable to see that the seating arrangement and continuous pair work had positive influence in the findings.

Conclusion

Reading skill is key for academic success (Hemmati & Bemani, 2013). For that reason, students must be trained in making use of reading strategies that help them in total comprehension of texts. This study analyzed the impact of QAR strategy combined with ICTs in reading comprehension. After the pedagogical intervention, findings demonstrated that the strategy was effective for in-class activities. It raised students' overall comprehension, increased their participation in class, fostered their social and teamwork skills, and promoted their critical thinking as well as their autonomy. Nevertheless, the strategy proposed did not have any effect on students' test scores which suggests that further research must be conducted in this regard. Lack of research about QAR in Latin America urge the need to analyze more on this topic aiming at affecting reading comprehension levels.

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Appendix A

Comparative results of participants' English level

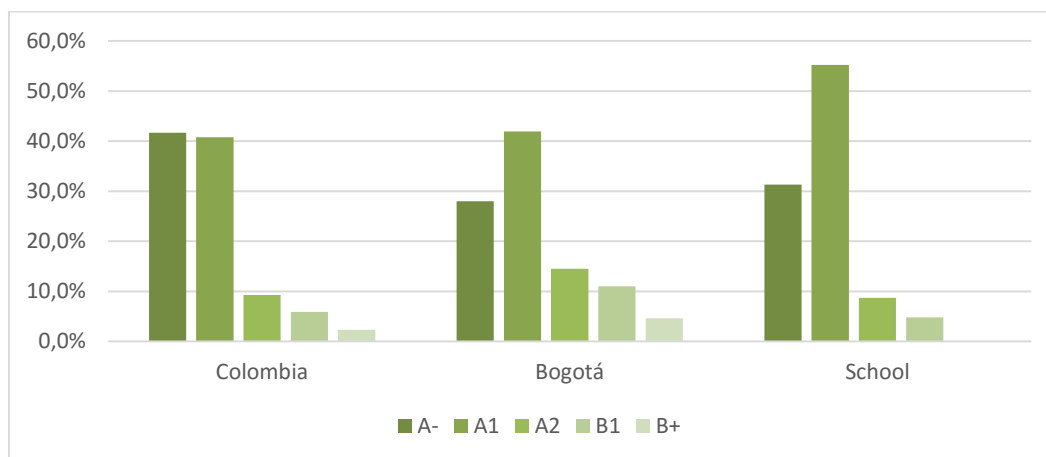


Figure 4. Percentage of students classified in CEFR levels in the school, the city where it is, and the country (Taken from ICFES, 2015).

Appendix B

Colombian expectations of students' English level

Table 7. CEFR equivalence for each school year in Colombia (taken from MEN, 2006).

Levels according to CEFR	Common level's name in Colombia	Expected educational level to develop language level	Goals for education in 2019
A1	Principiante (beginner)	1 st to 3 rd grades	
A2	Básico (elementary)	4 th to 7 th grades	
B1	Pre intermedio (pre intermediate)	8 th to 11 th grades	Minimum level for 100% of graduate students in high school.
B2	Intermedio (intermediate)	Universitary studies	Minimum level for English teachers. Minimum level for other professionals.
C1	Pre avanzado (pre advanced)		Minimum level for recently graduated language teachers.
C2	Avanzado (advanced)		

Appendix C

Students' short survey

Teacher:	
Date:	
Observation number:	
Main objective:	

Research Question

How does the use of question-answer relationship activities integrated in interactive readings affect reading comprehension in A1 (CEFR) eleventh graders at a public school in South-East Bogota?

To identify the extent in which ICTs and QARs could improve reading comprehension in order to foster the use of reading strategies in students.

Basado en la lección de hoy ¿cómo calificarías tu experiencia de lectura?

Para nada agradable	Muy poco agradable	Igual que antes	Agradable	Muy agradable

¿Qué tan útil ha sido la lección de hoy para tu comprensión lectora en inglés?

Para nada útil	No tan útil	Igual que antes	Muy útil

¿Qué partes de la lección te han dado esa impresión?

¿Qué sugerencias tienes para mejorar tu comprensión lectora en inglés para las próximas sesiones?

Appendix D

Teacher's journal

Teacher:	
Date:	
Observation number:	
Main objective:	

Research Question

How does the use of question-answer relationship activities integrated in interactive readings affect reading comprehension in A1 (CEFR) eleventh-graders students at a public school in South-East Bogota?

To identify the extent in which ICTs and QARs could improve reading comprehension in order to foster the use of reading strategies in students.

Data collection instrument question

How does the reflection upon the aspects observed in class help to improve the subsequent interventions?

Students' interaction	Development of activities	Use of QAR language	Use of ICTs	Further questions

Appendix E

Artifacts: Multiple-choice test

Name

Date

Read the story and answer the questions that follow.

There once was a king whose name was Dionysius. He was so unjust and cruel that he won for himself the name of a tyrant. He knew that almost everybody hated him, and so he was always in dread lest someone should take his life.

But he was very rich, and he lived in a fine palace where there were many beautiful and costly things. And he was waited upon by a host of servants who were always ready to do his bidding.

One day, a friend of his, whose name was Damocles, said to him, "How happy you must be! You have here everything that any man could wish."

"Perhaps you would like to change places with me," said the tyrant.

"No, not that, O king!" said Damocles. "But I think that if I could only have your riches and your pleasures for one day, I should not want any greater happiness."

"Very well," said the tyrant. "You shall have them."

And so, the next day, Damocles was led into the palace, and all the servants were bidden to treat him as their master. He sat down at a table in the banquet hall, and rich foods were placed before him. He lacked nothing that could give him pleasure. There were costly wines, and beautiful flowers, and rare perfumes, and delightful music. He rested among soft cushions and felt that he was the happiest man in the world.

Then he chanced to raise his eyes toward the ceiling. What was it dangling above him, with its point almost touching his head? It was a sharp sword, and it was hung by only a single horsehair. What if the hair should break? There was danger every moment that it would do so.

The smile faded from the lips of Damocles. His face became ashy pale. His hands trembled. He wanted no more food; he could drink no more wine; he took no more delight in the music. He longed to be out of the palace, far away; he cared not where.

"What is the matter?" said the tyrant.

"That sword! That sword!" cried Damocles. He was so badly frightened that he dared not move.

"Yes," said Dionysius. "I know there is a sword above your head, and it may fall at any moment. But why should that trouble you? I have a sword over my head all the time. I am every moment in dread lest something may cost me to lose my life."

"The Sword of Damocles"

Assessment

1. Which statement best describes how Damocles views the life of Dionysius at the beginning of the story?

- A. easy and carefree, because he is so cruel
- B. dangerous, because his subjects may kill him
- C. wonderful, because he has riches and fine things
- D. lonely, because his subjects don't like him

2. Which word best describes Damocles at the beginning of the story?

- A. happy
- B. jealous
- C. frightened
- D. adventurous

3. Why is Dionysius referred to as “the tyrant”?

- A. to remind us that he is very rich
- B. to remind us that he is a good friend to Damocles
- C. to remind us that he doesn't want to be king anymore
- D. to remind us that he is a very cruel and unfair king

4. Dionysius rules his kingdom like a tyrant, so his subjects

- A. want to kill him.
- B. would prefer Damocles be king.
- C. are happy for him.
- D. refuse to eat and drink with him.

“Let me go,” said Damocles. “I now see that I am mistaken and that the rich and powerful are not so happy as they seem. Let me go back to my cottage among the mountains.”

And as long as he lived, he never wanted to change places with the king.

Assessment

5. When Damocles chooses to live like the king, what does he learn?

- A. He realizes that having riches only brings problems.
- B. He learns that being the king is hard work.
- C. He understands that the king’s life is not as easy as he thought.
- D. He has an argument with Dionysius.

6. What problem does Damocles have at the start of the story and how does he solve it?

- A. He is very hungry, and he is able to have his fill of food and drink at the palace.
- B. His life is in danger, but he is able to gain protection from the king by becoming his friend.
- C. He envies the king’s riches, but he realizes that his own life is happier.
- D. He is upset that the king is a tyrant, and he convinces the king to be kinder.

7. Which of the following statements might Damocles make at the end of the story?

- A. “I will do my best to protect the king from danger.”
- B. “I don’t want to be king, but I still want to be wealthy and strong.”
- C. “I will try to find a stronger rope to hold the sword.”
- D. “I don’t want to be rich and powerful because it might not make me happy.”

8. Which is an example of figurative language from the story?

- A. He was so badly frightened that he dared not move.
- B. He lacked nothing that could give him pleasure.
- C. When Dionysius tells Damocles, “I have a sword over my head all the time.”
- D. When Damocles tells Dionysius, “I should not want any greater happiness.”

Appendix F

Sample lesson plan

Third Week Sessions (Second Phase: QARs and ICTs)

Teacher:

Date:

Course:

Number of students:

Class time:

Main objective: Students will be able to synthesize information through mind maps and promote peace through websites.

STAGE	AIM	PROCEDURE Teacher and student activity		TIME
		First Session	Second Session	
Warm-up	To engage students with English language.	Students will be asked to get in groups of three, they will be presented some newspaper and will be asked to find news about violence and peace within 10 minutes. They will be given 5 minutes to write down as much information as they remember and then socialize what they wrote down.	Students will search in the web information about war around the world. In pairs, they will post on a Padlet some of the headings found. Then, students will try to guess what the piece of news was about.	20 minutes
Presentation	To engage students in higher levels of thinking in reading comprehension by outlining ideas and synthesizing information through graphics and using QAR strategies.	Students will be presented some vocabulary which students will have to look up and classify in "peace" or "violence". Then, they will be shown the title of the text and they will be asked to predict the content of the reading by sharing their ideas using some of the vocabulary presented before.	Students will be presented "bubbl.com" as a tool to create mind maps. Then, students will be given a web address where they find a text about Peace Corps. They will be asked to synthesize the text in the mind map tool.	50 minutes

		In pairs, students will read the text and make an outline in a google doc. Finally, students will answer the “In the Book” reading comprehension questions and socialize their answers.		
Procedure	To foster students’ autonomy by applying QAR strategies and ICTs.	Students will be asked about violence in their neighborhoods and what they could do to foster peace. They will be asked to add their answers in the google doc posted before. Then, students will be presented some “In my Head” comprehension questions and compare what they had posted with the new answers given. Students will share their overall answers.	Students will be presented “wix.com” for them to start designing their own free website for the English course. They will be asked to design a front page and post their mind maps as a new tab within their website. Also, they will be asked to create a blog and post an “On my Own” question based on the reading topic.	40 minutes
Closure	To check students’ understanding of the topic of the lesson.	Students will summarize what they did throughout the lesson.	Students will be asked to answer the question of another pair of students’ blog.	10 minutes

Appendix G

Students’ answers to short surveys

	<u>S1</u>	<u>S2</u>	<u>S10</u>	<u>S11</u>	<u>S17</u>	<u>S19</u>
Basado en las lecciones de esta semana ¿cómo calificarías tu experiencia con la lectura en la clase de inglés?	Un poco mejor. Si porque tenemos más vocabulario, términos especiales.	Un poco mejor que antes	Mucho mejor que antes. Ahora se me facilita comprender los textos.	Mucho mejor que antes	Un poco mejor que antes	mucho mejor que antes
¿Qué tan útil han sido las lecciones de esta semana para tu comprensión lectora en inglés?	Bastante útiles. Porque hablamos de diferentes temas y no solo nos limitamos a escribir, sino que también tratamos de comprender textos.	Bastante útiles	Bastante útiles. He aprendido palabras que no había escuchado y también he aprendido a analizar un texto.	Bastante útiles	Bastante útiles. Clasificar las preguntas me facilita responderlas	bastante útiles
¿Qué momentos de las lecciones te han dado la impresión marcada en la pregunta anterior?	En los momentos en los cuales traducimos palabras de cualquier tema, redactamos oraciones para	Cuando el profesor nos pone a leer textos cotidianos, me he dado cuenta de que mi vocabulario ha	La actividad de los alcoholes me pareció un buen método en donde se me facilitó más la comprensión en inglés, al momento de realizar el mapa	los momentos donde él nos aporta nuevo vocabulario y pronunciación	Cuando el profesor nos enseñó los tipos de preguntas que nos podemos encontrar y cuando había preguntas sobre	cuando aprendemos vocabulario que nos ayuda con las lecturas y lo que podemos hacer con los temas

	exponerlas, cuando escribimos frases sin traductor, las clases han sido fructuosas por los temas abarcados y la dinámica que se usa para desarrollar las clases porque realizamos mapas conceptuales, blogs, leemos textos.	mejorado y que a pesar de lo difícil que a veces se torna esta materia para mí.	mental.		las lecturas, él nos preguntaba qué tipo de preguntas eran	de las lecturas.
¿Qué aspectos (positivos y negativos) sobre las actividades realizadas con relación a la comprensión de lectura podría resaltar?	Me pareció una buena forma de aprendizaje ya que ningún profesor hoy en día enseña con métodos nuevos, si no siempre es frente a un tablero. Las actividades fueron apropiadas para nuestra edad.	Con respecto a la clase de inglés me parece interesante porque es dinámica, el profesor utiliza muchos recursos como juegos, textos de interés, el uso de internet; para aprender vocabulario y que la clase sea fructuosa. Me parece que explica bien los temas para abordar textos y que también con el uso de internet podemos encontrar muchas cosas que no aburren la clase; y pues que también nos hace aprender sobre las ventajas y cualidades del internet. Aunque las clases tradicionales también son buenas, porque el profesor sabe explicar bien y también se dirige bien hacia los alumnos. pero	Empezare con las partes positivas. El profesor nos enseña nuevas maneras de desarrollar un trabajo. No solo nos ha ayudado a nuestra comprensión lectora, sino que también ha mejorado otros aspectos. El profesor pone textos del diario vivir, es decir, el profesor pone temas que tenga que ver con cosas que nos involucren de alguna manera y esto ínsita a la lectura de dicho texto. Las lecciones son grupales y esto ayuda a el trabajo en grupo y el ampliamiento del vocabulario. (Dos cabezas piensan mejor que una). Tenemos ayudas visuales y una breve introducción al tema antes de ser expuesto, esto nos ayuda a entender mejor ciertos puntos. Puntos malos. La mayoría de los textos son un poco largos y esto conlleva a que pasemos parte de la clase intentando entender, y casi no	Las actividades para aprender vocabulario y el uso del computador para encontrar otras formas de resolver las actividades. Las lecturas son de temas conocidos, lo que se nos hace más fáciles de entender. De pronto las actividades necesitan mucho tiempo y pues algunos de nosotros nos demoramos mucho en resolverlas.	Usar diferentes programas en los computadores nos ayudó mucho en la comprensión. Tener a la mano el tipo de respuesta que quiere la pregunta también me ayudó a buscar la respuesta más rápido. De pronto el tiempo no era suficiente o a veces teníamos muchos trabajos de la técnica y llegábamos cansados a clase.	Me gusta la forma en que sacamos el vocabulario necesario entre todos con los computadores. Así entendemos mejor las lecturas. Las formas como hemos utilizado los temas de las lecturas para hacer campañas con poster o hacernos pensar, como el de los ministros de educación o la campaña del cigarrillo. Los medios digitales nos permitan participar más que en el salón. Aunque las actividades eran muy entretenidas, a veces las teníamos que hacer muy rápido por el tiempo.

		más interesantes son en las que se hace uso del internet porque cada estudiante no solo se limita a ver redes sociales sino a indagar sobre otros programas que nos ofrece el internet.	queda tiempo para solucionar o terminar la actividad correspondiente (en mi caso). Hay actividades que toca terminar en la casa porque la clase no alcanza, y esto hace que me atrase porque cuando llego a casa me pongo a hacer planos.			
¿Qué expectativas y/o sugerencias tienes para las próximas elecciones con miras a mejorar tu comprensión lectora?	Que por medio de imágenes redactemos textos. Seguir con la lectura de textos con diferentes temas, en especial temas que a los estudiantes les llame la atención como la parte de sexualidad, drogas, modas, para que ellos se interesen y aprendan mejor usando los tiempos y los requisitos para que el inglés sea más dominado, pero también usando diferentes actividades para que la clase sea activa	Con respecto a las sugerencias, es divertido que el profesor sea variado en sus clases. sin embargo, a veces me da pereza hacer las actividades que pone el profesor, pero no porque sean aburridas sino porque requieren bastante tiempo y pues en la técnica en la que me encuentro en este momento, siento que no tengo tiempo ni para dormir. Me agrada la manera en que el profesor maneja los temas, pero debería hacer actividades que requieran menor cantidad de tiempo.	Para mejorar mi comprensión lectora en ingles debo poner en práctica más textos para así poder tener mejor fluidez a la hora de hablar en ingles	Temas de actualidad que nos permitan discutir más. Sin embargo, que los textos sean un poco más cortos.	espero que el profesor nos enseñe otras formas de entender mejor la lectura. que sigamos utilizando los computadores para ayudarnos.	Espero que los temas sigan siendo interesantes para leerlos con agrado.

Appendix H

Teacher's journals 3 and 7

	Teacher's Journal
	Name: Alexander Miranda
	Date: September 27th, 2016 Session 3
	<i>Students will be able to discriminate main and secondary ideas by classifying them through ICT tools in order to promote something through digital campaign.</i>
Students' interaction	Individual work was OK. Short but engaging exercise.
	Students seemed to get the importance of using emails to share and work on academic information.
	Groups of 4 was necessary for number of computers, but not all of them were focused on the task.
Reading stages	The vocabulary taught was crucial to help students save time in the reading. Images used helped as metacognitive strategy.
	The reading topic was useful for students: familiar topic = understandable reading.
	Comprehension questions helped to check that most of students understood the text (good thing because they are 32!)
	Questions proposed by students were mostly tricky: they intended to confuse their classmates.
Use of QAR language	Students seem keener to identify types of questions for both: answering and creating their own.
	However, "Think and Search" is still difficult to figure out when designing.
Use of ICTs	Use of Padlet, online dictionaries and google docs became "normal" tools for students.
	They already ask if they will post on Padlet.
	The use of emails has to be refined.
Further Questions	How can I make students focus on group work when required?
	Are emails that useful for this study?

	<p>Teacher's Journal</p> <p>Name: Alexander Miranda</p> <p>Date: October 18th, 2016</p> <p style="text-align: right;">Session 7</p> <p><i>To foster autonomy by providing tools for students to freely select which ones to use in reading comprehension exercises and digital campaigns.</i></p>
Students' interaction	Warm-up activity was engaging. Students are more open to share ideas and talk to other students than their friends. However, the use of Spanish is still recurrent.
	Students had to discuss with their partners to write at least five vocabulary word on the common list that helped them go over the reading.
	It was difficult for students to come to an agreement on what information to post on their wix site. That may be because of the amount of information and the question they had to post afterwards. Perhaps, they did not want to feel overwhelmed for the load of reading then.
	The feedback provided to their partners' answers was more formal than expected, although shallow.
Development of activities	Gather healthy and unhealthy habits. Students participated actively around the classroom. The use of Spanish was frequent even after telling them not to do so.
	Post on Padlet ideas about smoking. Each pair of students had to come to an agreement on what information to post. Therefore, it fostered critical thinking on decision making.
	However, there was some disorganization when students were posting. Everyone posting at the same time.
	Share 5 vocab words on google doc to make a single vocab list. It fostered collaborative work
	It was enriching for the reading part, but for some reason turned into a competition and became frustrating for some students because the words that some students wanted to add were already there.
	Sum up the text with free strategy. Pair groups used mind maps with very concrete information.
	Specific details were omitted, but the general information was grasped and showed understanding of the text. The activity took a long while though.
	Answer in my head questions. Students made use of their mind maps and the vocabulary on the google doc to answer the questions presented.
	Students were aware of the fact that questions were addressed to their opinions and thoughts, but their answers were rather short.
	Smoking in Colombia: post findings on wix site. Make a question. Students made a fast search and most of them addressed to Wikipedia. They were encouraged to search in different websites for unusual information.
	The ideas for the question they had to post were good, but formulating it in English was challenging. Half of the group were making use of Google translator because of the time left.
	There was no time to use the random assign tool. Each group answered the question of the group on their right.
Use of QAR language	When students approached the text, they immediately referred to the comprehension questions. Although the teacher asked them which type of questions they were, they already identified the two "In my head" types of questions. Answers were given properly.
	They also understood what question they had to post on their wix site when the teacher asked them for an "on my own" one. That implies that students internalized notions of QAR
Use of ICTs	Students made good use of the different resources provided and the independent search on the web. Some groups insisted on listening to music while doing the tasks because that boosted their concentration.
	The use of Padlet had to be controlled because students wanted to make fun and for a while they lost track on what they were supposed to do.
Further questions	Reading comprehension was highly productive. Inferential questions demonstrated good understanding: literal comprehension questions are better out of the tasks?