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QUIZZ AND SMARTPHONES: WARM-UP STRATEGY FOR IMPROVING UNIVERSITY STUDENTS' CLASS PARTICIPATION

QUIZZ Y SMARTPHONES: ESTRATEGIA DE CALENTAMIENTO PARA MEJORAR LA PARTICIPACIÓN EN CLASES DE LOS ESTUDIANTES UNIVERSITARIOS

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Abstract

Due to the impact of the internet and technology on the millennials generation, the teaching and learning process must be integrated by both trends, as they can increase university students' motivation as well as their levels of class participation. This integration can be achieved through potential and authentic pedagogical strategies: warm-up activities using smartphones and a technological tool called Quizizz. The objectives of this study were: 1) to identify if students increased their class participation after using quizzes and smartphones as a warm-up strategy, and 2) to explore the perceptions of the students about their level of class participation. Data were collected with the application of three instruments (the teacher's diary, a classroom map, a students' perception scale) and also a combination of a qualitative and a quantitative data analysis. The results of this study pointed out that all of the 47 participants improved their willingness to participate in class. However, their own perceptions about participation did not show any particular change. In other words, the students' willingness to participate in class positively changed, but their own perceptions about participation remained the same before and after the application of these strategies.

Keywords: Warm-up strategy, smartphones, quizizz, class participation, university students.

Resumen

Debido al impacto del internet y la tecnología en la generación de los millennials, el proceso de enseñanza-aprendizaje debe ser integrado por ambas tendencias, ya que pueden aumentar la motivación de los estudiantes universitarios y sus niveles de participación en clases. Dicha integración puede lograrse a través de una potencial y auténtica estrategia pedagógica: las actividades de warm-up con smartphones y una herramienta tecnológica llamada Quizizz. Los objetivos de este estudio fueron: 1) identificar si los estudiantes aumentaron su participación en clases después del uso de quizizz y smartphones como estrategia de warm-up, y 2) explorar las percepciones de los estudiantes sobre su nivel de participación en clases. Los datos se recopilaron con tres instrumentos (El diario del profesor, el mapa del aula y la escala de percepción de los estudiantes) y se utilizó una combinación de análisis cualitativo y cuantitativo de datos. Los resultados de este estudio indicaron que los 47 participantes mejoraron su disposición de participar en clases. Sin embargo, sus propias percepciones al respecto, no revelaron ningún cambio. En otras palabras, la disposición de los estudiantes de participar en clases cambió positivamente, pero sus propias percepciones de participación, siguieron siendo las mismas antes y después de la estrategia.

Palabras claves: Estrategia de calentamiento, smartphones, quizizz, participación en clases, estudiantes universitarios.

INTRODUCTION

Nowadays, people of all ages have access to technological devices daily. Among all the new technologies, mobile phones or smartphones are doubtless, the most popular among people around the world. Many studies support the use of these devices in education and describe it as “a popular learning tool” (Kiernan & Aizawa 2004:80) and as “effective tools for a broad range of educational activities” (Thornton & Houser 2005:226).

As technology has become ubiquitous, the new methods or techniques used inside the classroom should not be only suitable to the students' personal characteristics, needs or curriculums' objectives; but also, methods should meet working demands, requirements of new pedagogical social trends and students' multiple intelligences.

Moreover, language learning adversities such as: students' lack of interest, tiredness, boredom and personal matters along with the revolution of technology; make teachers reconsider classroom practices to encourage students to participate, create, communicate, collaborate and cooperate during the lessons.

Today's students are all digital people, in other words, they are familiar to digital technologies and they take great advantage of the new innovations available (Langan *et al.* 2016:111). Searching for information, downloading materials, communicating, browsing and playing games are some of the infinite possibilities for accessing this new technological world. With this in mind, some researchers agree that “using real world resources for teaching and learning in the classroom can make education more meaningful and relevant to our students” (McNeal & van't Hooft 2006).

Inside the classrooms, the use of technological

devices is not new. A number of teachers have discovered the benefits of using and integrating different tools as computers, projectors, televisions, tablets or iPads into the educational curriculum. However, research shows that mobile devices can integrate and transform classroom teaching methods across the curriculum more easily than desktops (Sung, Chang & Liu 2016:253). According to the Telecommunications Office in Chile (SUBTEL in Spanish), there were 23 million cell phones in 2017 (SUBTEL 2017:1).

Technology has had an important role in English for Specific Purposes (ESP), including Business English (BE) courses, which are both “directed towards the immediate professional or academic demands and applicable situations” (García-Laborda & Frances-Litzler 2015:43). Technology can also benefit students' motivation, productivity and engagement in the lessons (Roblyer 2015:209).

Millennials are leading the ranking among the users of mobile phones and the internet. Even though, smartphones may be seen as a threat or a means of distraction and danger for many teachers; these new generations of Chilean students are connected to the web during 38.5 hours per week, where 16.3 hours of connection is via mobile or smartphones (Díaz 2017:1).

A possible, meaningful and accurate procedure for integrating technology into the classroom and lessons, may be through the use of a strategy of warm-up activities. Warm-up activities are short activities developed for the introduction of the lesson (Diril 2015:143). These activities have a great impact on students' learning and participation in any English class.

It is suggested that, adults' participation in higher education and other learning endeavors is predicated on motivation and that adult learners are motivated by diverse factors” (Sogunro 2015:23). When warm-up activities are prepared using technologies such as: computers, cell phones, online videos or social media, it helps students engage the lesson contents in accordance with their needs (Cutter 2015:2).

Quizizz, for instance, is a free pedagogical and technological multiplayer tool for classroom activities that allows students to practice individually or in teams with their smartphones. Quizizz is available as an application and as a webpage, it supports different devices with a browser. The main purpose of this tool is to play or create student-paced formative assessments in a fun and engaging way for students of all ages, but in this study, it was used as a tool for delivering warm-up activities through the use of smartphones.

The main research aim of this study was to analyze university students' level of participation in ESP lessons before and after the use of the warm-up strategy along with smartphones and the Quizizz tool. This aim sought specifically:

1. To identify if the students increased their class participation after the use of quizizz and smartphones as a warm-up strategy.
2. To explore the students' perceptions on their level of class participation.

This paper is in the context of the research grants FONDECYT 1191021 entitled *Estudio correlacional y propuesta de intervención en evaluación del aprendizaje del inglés: las dimensiones cognitiva, afectiva y social del proceso evaluativo del idioma extranjero*, and VRID Enlace 218.003.002-10 UDEC, *La evaluación del inglés: conocimientos, percepciones, disposiciones afectivas y representaciones sociales. Una mirada sistémica del proceso evaluativo desde los profesores y futuros profesores de inglés, estudiantes, autoridades y apoderados*.

METHODOLOGY

Since it is urgent to understand and explain the possible benefits of a new teaching-learning strategy using a technological device, this study applied a qualitative perspective with the idea of understanding in depth this local phenomenon in order to obtain valuable answers for this pedagogical practice towards university students'

class participation engagement.

The proposed strategy was implemented on two tertiary education groups of English students and was framed within a participatory action research design: a collaborative and reflective manner where the teacher and the students experienced themselves the intervention in order to improve a specific educational problem about their own context and practice. In support of this argument, "the main point of action research is to find out more about what is going on in your own local context in order to change or improve current practice in that situation" (Heigham & Croker 2009:117).

The scope of this research is descriptive since the intention of this study was to describe in detail a local issue by providing background information about it and gathering the data after its intervention stage (Sajjad 2016:202).

This study was conducted in a public Chilean university. The cohort was 17 freshmen from an elementary ESP class and 20 sophomores from an intermediate EB class. The first group of participants was constituted by 8 men and 9 women and their ages ranged between 18 and 21; the second group was confirmed by 7 men and 13 women whose ages ranged between 19 and 27. It is important to mention that in Chile currently it is possible to see a balance of women and men in some of the university programs. Both groups presented the following characteristics:

- A1 to C1 English proficiency levels according to the Common European Framework of Reference for Languages.
- Lack of motivation and interest towards the English lessons.
- Major interest in new technologies.
- Users of smartphone devices.
- Lack of participation during the lessons.
- Participants came from the areas of Engineering and Business and Administration

The criteria adopted to choose these groups was related to students' previous performances and perceptions with regard to English lessons. These two groups of students were very difficult to encourage their class participation and were interested in changing the lesson methodologies. Thus, based on the specific characteristics of both groups and the research objectives of this study, a purposive sampling technique was adopted (Etikan, Musa & Alkassim 2016:2).

The intervention lasted a week and a half, with a frequency of three sessions of 15 minutes each. Regarding the planned strategy, participants had the opportunity to use an innovative technology-based strategy, where the activities were short and created based on participants' needs. The general steps to join Quizizz are shown in Figure 1 below.

Source: Own elaboration to show the steps to join quizizz

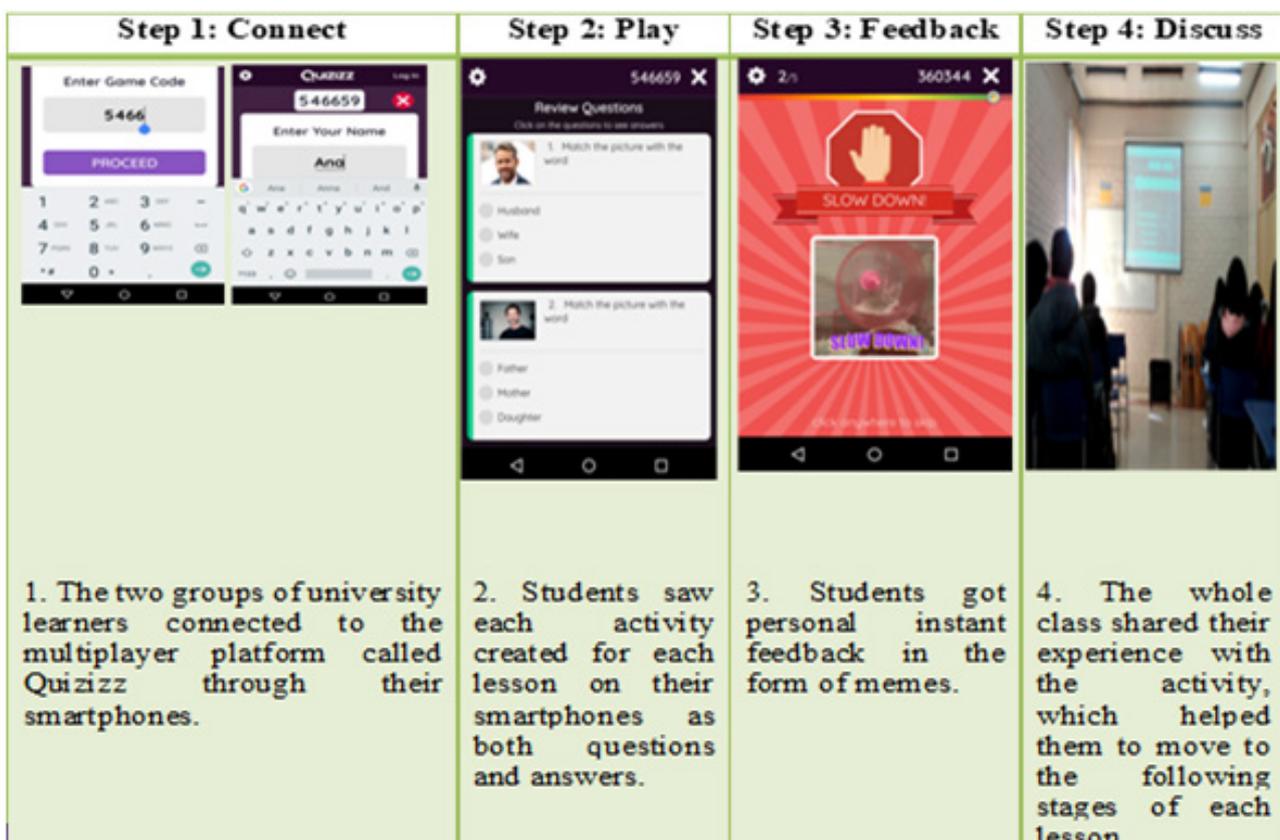


Figure 1: Steps to join quizizz and smartphones as a warm-up strategy

At the beginning of each lesson, participants were introduced to the Quizizz tool by asking them to go online (<https://quizizz.com/join/>). Next, they joined to the warm-up strategy by writing a code number and a nickname on their smartphones and then started to complete the activities related to each lesson's aim. Finally, participants checked their answers by discussing them with a partner and the whole class. In each

intervention session, a different warm-up activity was applied such as matching pairs, memory games and vocabulary surveys. Figure 2 shows the different warm-up activities that were applied.

Source: Own elaboration to show the warm-up activities

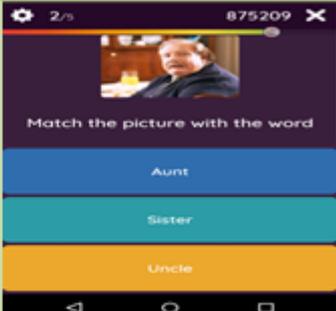
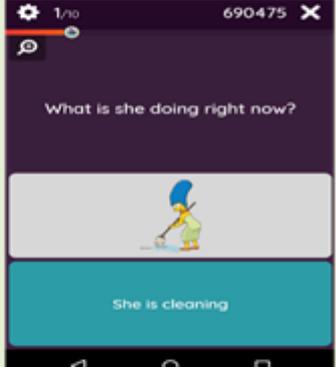
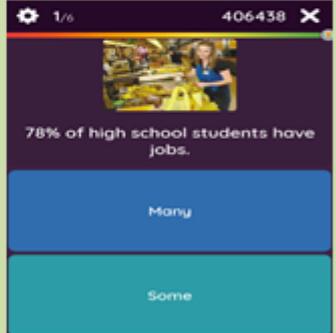
Warm-up	Description	Example
<p>Session 1: Matching pairs</p>	<p>Quizizz showed a matching pair warm-up strategy. Students had to select the best correct word for each picture.</p>	
<p>Session 2: Memory game</p>	<p>Quizizz showed a memory game warm-up strategy. Participants had to remember as many activities.</p>	
<p>Session 3: Vocabulary survey</p>	<p>Quizizz showed a vocabulary survey warm-up strategy. Participants had to consider and select the best option for a survey.</p>	

Figure 2: Warm-up activities

The data collection techniques chosen for this study were three mixed methods supported by concurrent validity and proven by piloting the instruments with a group of participants with similar characteristics to participants of this study. It was proven how the instruments (The teacher journal, The classroom map and The students' perception scale) were actually able to predict a possible explanation for each of the specific objectives proposed in this study. Therefore, the three data collection methods were applied during the three sessions of the study.

The teacher journal was used to keep a record of what it was observed during and after the implementation of the strategy. The classroom map was used to record participants' interaction, illustrate and compare what happened during the different lessons. In addition, The students' perception scale was used to identify participants' opinions and beliefs about their own level of lesson participation.

A thematic analysis was used to analyze The teacher journal as well as The classroom map.

For The students' perception scale, frequency analysis was used. To organize the data collected, the following steps were followed: 1) Familiarization with the data, 2) coding, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes and 6) writing up. On the other hand, to assure validity and capture different dimensions of the data collection techniques, the three of the instruments were triangulated (Braun & Clarke 2006:87).

Triangulation refers to the use of multiple methods or data sources in qualitative research to develop a comprehensive understanding of the phenomena (Korstjens & Moser 2018:121). For instance, in this study The students' perception scale was used to measure the relationship between the implementation of the use of Quizizz and smartphones as a warm-up strategy, and the possible changes on participants' behavior. At the same time, participants' improvement on their level of class participation was explored using The teacher journal's observations along with the qualitative comments given by participants in the second section of The students' perception scale.

RESULTS AND DISCUSSION

The data was analyzed separately according to the specific objectives of the study.

SPECIFIC OBJECTIVE 1: TO IDENTIFY IF THE STUDENTS INCREASED THEIR CLASS PARTICIPATION AFTER THE USE OF QUIZZ AND SMARTPHONES AS A WARM-UP STRATEGY.

In order to analyze if there were any changes on the students' participation after working with

the intervention strategy, two instruments were used. The teacher journal served to record impressions and details related to the strategy and participants' behaviors and attitudes in the classroom. Besides, The classroom map was used to register the student interactions while they were using Quizizz. For the analysis of both instruments a thematic analysis was used, showing the most recurrent themes and sub-themes presented during the observation process.

Table 1 shows the main theme related to the use of Quizizz and smartphones as a warm-up strategy and the most recurring sub-themes related to both intervention groups in the study. The first theme presented was the Quizizz and smartphone warm-up strategy, where the teacher, along with participants registered some recurrent characteristics and sub-themes as shown in Table 1. It is presented how many times each group mentioned and related these sub-themes with the Quizizz warm-up strategy.

Table 1: Use of Quizizz and smartphones as a warm-up strategy

Theme	Sub- themes	Frequency	Group	Observed by
Quizizz and smartphone warm-up strategy	Students' familiarity with the strategy	37	Group one: 17 Group two: 20	Research-practitioner
	Students' difficulty with the strategy	3	Group two: 3	Research-practitioner
	Students' backwardness	9	Group one: 1 Group two: 8	Research-practitioner
	Unclarity of instructions	2	Group one: 1 Group two: 1	Research-practitioner

Source: own elaboration from the data provided on the main themematic analysis

Regarding the impressions expressed by the teacher, one of the most recurrent sub-themes presented was Students' familiarity with the strategy as it seems that all participants were used to working with their smartphones and technology in their daily lives. It appears that it was easy for them to interact with the Quizizz as a warm-up strategy. Therefore, all of them were willing to participate during the implementation with no further problems.

Even though the 37 participants were part of

the strategy and completed it, some of them had some drawbacks as shown in Table 1, where students showed some difficulty with certain questions that were part of the strategy, it was also observed that there were problems with the students' backwardness.

Nine students were left behind while the rest of the participants had finished with Quizizz, so these students had to wait for the others to end the strategy. Even though Quizizz had a time set for each activity, between 35 and 100 seconds to answer each Quizizz item, some of the students were faster than others.

Finally, it was noticed that in two occasions the instructions given to participants might not have been clear so they asked the teacher again in order to explain it in Spanish for a better understanding. This situation may have occurred since most of the students from the two groups had a poor understanding of English and in most of the lessons the teacher had to clarify the instructions and content in their mother tongue in order to simplify the information given so they could carry out the different activities during the lesson.

A second theme was related to the warm-up activities applied during the three sessions through the technological tool Quizizz supported by smartphones. In each of the three sessions of the intervention, a different warm-up activity was employed for both groups such as: Matching pairs, Memory games and Vocabulary surveys, respectively.

It seemed that even though these warm-up activities were developed once in each group, the students showed a different and better disposition to work and participate than in previous traditional warm-up activities.

Prior to the implementation of the intervention, participants were exposed to the same warm-up activities but their interest and level of participation were lower, possibly because they were not attracted to them, they were afraid of participating in front of the class or they were not used to using Quizizz in most of their other courses. Most of their courses were lectures where they were just seated and had to listen to their teach-

ers. The methods used to present these activities were not appealing to their multiple intelligences or communicative needs.

It is important to note that even though The students' perception scale was not meant to be used for this objective, some of the students' comments noted at the end of the scale were beneficial to this purpose as seen in Table 2 and Table 3.

Table 2 shows a third theme allied to the technology used during the three sessions and some examples were extracted from the qualitative comments that students wrote in the comment section in The students' perception scale. These observations were expressed during the first and last day of implementation. Smartphone, WI-FI connection and Quizizz sub-themes were recurrent subjects associated to the use of technology in the classroom.

Table 2: Use of technology

Theme	Sub-themes	Shown in	Comments
Use of technology	Smartphones as a excluding device	Group one	... I feel that it also excludes students who do not have the necessary technology to have the application (G1)
	Misfunctioning of WI-FI connection	Group one Group two	During the Quizizz activity it was disconnected from my internet and I couldn't finish it (G2)
	Quizizz as a motivating tool	Group one	With the application the classes become more interesting. Personally, it motivates me to participate more (G1)

Source: own elaboration from the data provided on the secondary themematic analysis

Concerning the use of technology, three sub-themes were mentioned as shown in Table 2. From the participants' perspective showed in the students' comment section, the pedagogical tool Quizizz was helpful to motivate them to participate more during the lessons, they also mentioned it was interesting and fun to play with it.

Nevertheless, it seemed that for some participants, that the use of this strategy with a smartphone may exclude some of them due to the fact that they may not have this kind of technology required to be part of the lesson, so they would not be able to participate during the strategy.

Furthermore, while the strategy was applied, the WI-FI connection failed, thus, some of the participants could not keep working with the Quizizz section activities but they continued with their partners.

With this in mind, it seems that participants' positive perceptions about Quizizz, support the thesis that participants modified their behavior by improving their willingness to participate during the lessons. Likewise, by introducing a strategy related to participants' interests, they would feel more motivated to be part of the English lessons. However, before the strategy was applied, students had almost no interest and did not show any excitement to participate in the lessons.

During the observations, it could be noticed that they were very interested in the lessons and they encouraged themselves to continue playing with Quizizz and smartphones used as a warm-up strategy. As some of them mentioned in The students' perception scale comments, it was easier to continue with the next activity due to the fact that the strategy introduced them to the new vocabulary or the topic that they were going to learn and practice in the course of the lessons.

A fourth theme was showed in relation to participants interactions, through The classroom map there could be identified the most recurrent interactions that participants held during the implementation of the strategy. During the three intervention sessions per group, all participants interacted at some point with the strategy, with a frequency of 111 times. One of the most recurrent interactions was student-student (156 times) as they were asked to work in couples and discuss their answers to each other during the intervention strategy.

Finally, the student-teacher interactions were related to asking about instructions and answering questions about the strategy at the end of Quizizz, with a frequency of 136 times. The teacher-student interactions occurred with a frequency of 120 times, where the teacher explained the instructions and answered questions.

Participants were uncommonly active in relation to the lesson interaction while the intervention strategy was applied. Even though participants

were usually exposed to similar activities before the intervention, their level of interaction was very low as they preferred doing the activities by themselves or did them in their mother tongue.

After the use of this intervention strategy the two groups of participants changed their willingness to participate during the lesson. Participants increased their participation compared to the lessons before the action research intervention. From the teacher's observation, during the intervention they seemed more comfortable, excited and willing to work, spoke in English and shared with the rest of the class.

Group 1 asked the teacher constantly to work with the intervention strategy and participated actively in the lesson. Before the intervention, they had a low class participation since they were A1 level students and were afraid of making mistakes. Even though Quizizz showed how correct their answers were, they did not feel embarrassed to share their answers with the rest of the class. Similarly, Group 2 enjoyed the activities and, according to them, this allowed them to have a better understanding of the vocabulary and topics studied during the lessons.

In Figure 3, there is an example of The classroom map, which was used in one of Quizizz and smartphones warm-up strategy sessions to identify the position of the participants in the classroom and the interactions promoted by the intervention strategy.

Table 3: Students' comments about the English lessons

Theme	Sub- themes	Session	Comments
Students' perception of the English lesson	Students' participation in the English lesson	Session 1	Since English is harder for me to understand, my participation is very little because one feels insecure in answering or asking
	Students' interest in the English lesson	Session 3	I entertain myself in classes and that motivates me to learn English
	Benefits of the use of the strategy	Session 3	The strategy makes me more willing to participate in the classroom, without fear of being wrong, since everyone laughs and plays when someone makes a mistake but always helping and explaining the correct answer. The matter fixes easier on the mind
	Classroom interaction after the use of the strategy	Session 3	I like the interaction that is achieved during the process
	Cultural differences	Session 1	Sometimes the exercises are not well understood because of the gringo names or activities that I do not know

Source: own elaboration from the data provided on the secondary thematic analysis

The first sub-theme (Students' participation in the English lesson), illustrates participants' awareness on their level of participation in the lesson. When interpreting their comments, it seems that some of the students felt confident in relation to their English language proficiency, so they felt that they did not need to take part in the lesson discussions since they mastered the activities. In contrast, there were some participants, who felt the opposite as they were insecure of their English skills and they manifested that English was hard for them so they could not develop self- confidence in language performance.

Another idea that might be connected to the previous issue may be the classroom environment

created by the teacher and classmates, where the students may have felt anxious or insecure when they had the opportunity to speak or connect with others. For instance, students did not want to participate because they were afraid of being teased or judged by their group of peers or the teacher.

The second sub-theme (Students' interest in the English lesson), describes participants' attentiveness in the English language as a reason for motivation and engagement in the lessons. From the comments it could be inferred that the individual interests in the topics and learning a lan-

guage could be beneficial in acquiring, speaking English and participating.

The third sub-theme presented in the comment section of The students' perception scale was: Benefits of the use of the strategy. A number of participants mentioned the pros of this Quizizz strategy based on the use of smartphones. It must be reported that the effectiveness of this kind of strategy in an English as a Foreign Language classroom relied heavily on the lesson objectives, clarity of instructions and individual students' willingness to communicate or interact with others.

As the students noticed that Quizizz worked as a leading strategy for the lesson, it also enhanced participants' interaction, and the strategy facilitated the learning process possibly because of an emotional factor while they were working with it. Lastly, the strategy reduced the students' anxiety while they worked with their classmates as they were having fun and laughing. Thus, they did not feel under pressure since they were all working under the same conditions with a familiar tool.

In the fourth sub-theme (Classroom interaction after the use of the strategy), the participants pointed out the importance of interacting in a stress-free environment adding that they enjoyed working with the strategy because it allowed them to feel relaxed and participate voluntarily and spontaneously.

Furthermore, an important topic is the possible cultural difference that the content of the strategy might have presented; for instance, participants were learning a foreign language, and the topics were not familiar to them as it was expressed by the students. Finally, the fifth sub-theme (Cultural differences), illustrates a topic that may affect the students' willingness and engagement in the lessons and the importance of adapting the lessons to the students' real context to make them meaningful, engaging, authentic and collaborative, through the integration of technology and traditional materials.

SPECIFIC OBJECTIVE 2: TO EXPLORE THE STUDENTS' PERCEPTIONS ON THEIR LEVEL OF CLASS PARTICIPATION.

To meet this objective, The students' perception scale was designed according to the following dimensions that address students' perception on their class participation:

1. Oral participation
2. Nonverbal attentiveness
3. Engagement

The dimensions had three statements each, where participants had to tick their personal choice from the three options for each statement. The teacher addressed each dimension individually. For the analysis of both groups' data, it was calculated the average percentage for each dimension, the three statements and the number of answers categorized as: Disagree, Neutral and Agree.

Afterwards, it was calculated the percentages between each group. The responses were converted into comparative pie chart figures before and after the intervention as follows. Figure 4 shows participants' awareness and feelings about their oral participation before and after the intervention strategy.

Source: Own elaboration from the data provided on the students' perception scale

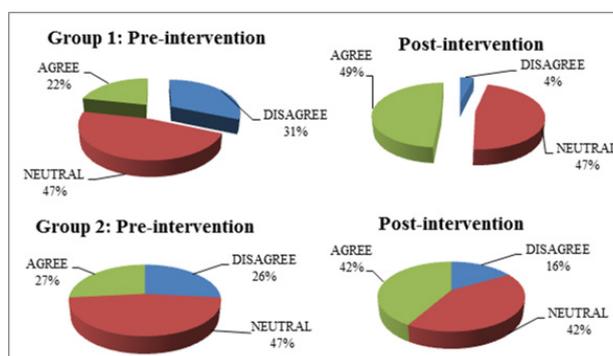


Figure 4: Students' perception about their oral participation

Regarding the first dimension (Oral participation), Group 1 of participants seemed to perceive that after the implementation of the strategy, they had improved their oral participation in a 49%. In contrast, there was only 22% of Agreement before the intervention. Nevertheless, 47% of participants maintained themselves as Neutral concerning Oral participation.

Group 2 of participants seemed to perceive that after the implementation of the intervention strategy, they had improved their Oral participation in a 42%. In other words, participants felt less anxious to speak in English and they were more motivated to communicate with the class. Nevertheless, 42% of participants maintained Neutral concerning Oral participation after the intervention.

Figure 5 illustrates the students' outcomes about their Nonverbal attentiveness behaviors in the pre and post intervention in Group 1 and Group 2.

Source: Own elaboration from the data provided on the students' perception scale

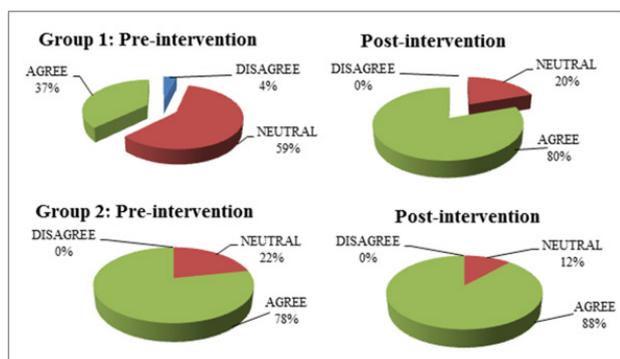


Figure 5: Students' perception about their non-verbal attentiveness

Concerning the second dimension related to the students' self-reported Nonverbal attentiveness that indicated involvement in the lesson, Group 1 of participants tended to Agree that after the intervention they responded nonverbally or paid attention to others in an 80%.

These findings lead to conclude that playing with Quizizz and using their smartphones helped the students to pay more attention to the classroom environment and lesson, as well as helped them be more aware or interested in the lessons. Furthermore, 0% percent of students Disagree with the statement that they did not connect with the lessons at some point or they were not involved in participating in the English lessons.

Group 2 of participants tended to Agree before (78%) and after (88%) the implementation that they usually answered nonverbally or paid more attention to the teacher or classmates. Equally in in pre and post interventions, 0% of participants disagreed that they did not show any kind of nonverbal response while they were in the lesson.

Figure 6 shows perceptions of Groups 1 and 2 with respect to participants' interest and motivation in the lesson before and after the intervention.

Source: Own elaboration from the data provided on the students' perception scale

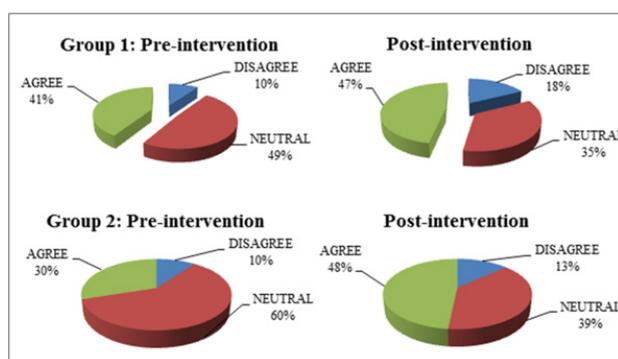


Figure 6: Students' perceptions about their engagement in the English lessons

In the third dimension: Engagement, which is defined as behaviors that are aligned with the motivation to learn (Liem & Martin 2012:3); the category Agree, slightly increased from 41% to 47% after the intervention where Group 1 was more interested and less anxious in participating after the intervention than before it.

Similarly, in Group 2 the category Agree in-

creased in an 48% after the intervention strategy, where Group 2 was more interested and less anxious in participating during the lesson. However, it appeared to happen that a small percentage of participants maintained their Disagree responses in relation to their lack of motivation and interest in the English lessons.

Technology has become ubiquitous in daily life and mainly in the professional sphere (De Paz, Rodríguez, Zato & Corchado 2015:3), which leads to the tendency of using it in the English classrooms. When teaching English for Academic Purposes (EAP) or ESP, the need to use authentic materials grows in every lesson (Bremner 2010; Evans 2012). Furthermore, teachers have embraced that technology increases the development of teaching methods as well as students' knowledge (Mosca, Paul & Skiba 2006:7), which seems promising to implement in the classrooms.

In terms of the objectives of this study, the first major result revealed that by employing Quizizz and smartphones as a warm-up strategy, ESP students modified their class participation. This finding coincides with the work of Gros, Kinshuk and Maina (2016) showing that students were active in relation with their lesson interaction while the intervention strategy was being applied (Gros *et al.* 2016:4).

One explanation for the students' change of behavior may be related to the warm-up activities, as preparatory time for the lesson, where students develop a positive disposition or attitude for learning (Rushidi 2013:130), just as the participants of this study did. Moreover, it was demonstrated in this study that students were eager to use the strategy and engage in the lessons by actively participating as it happened also in Rost's (2006) and Velandia's (2008) studies.

The percentages from the results suggested that the use of technology, as it was the case of Quizizz and smartphones used as a warm-up strategy, was useful to encourage or motivate students to participate more during the lessons. The data was consistent with Roblyer's (2015) summary of research findings in accordance

with the value and significance of technology for students' productivity and engagement in the lessons (Roblyer 2015:209).

The findings in this study proved wrong the work of earlier research studies (Thomas, O'Bannon & Bolton 2013) which tended to assume that the use of technology such as mobile devices is disruptive for class development (Thomas *et al.* 2013:295). The students in this study perceived technology as an opportunity to interact with their classmates, to share experiences and to learn in a more enjoyable and clearer manner, which allowed them to easily connect the new contents with the rest of the lesson (Gikas & Grant 2013:18).

Furthermore, this study revealed a major issue related to the technological tool set time, high-performance students had an advantage regarding time in comparison to the low-performance students, who took more time to end the intervention strategy proposed by the teacher. In this case, high-performance students started to feel anxious, bored and distracted low-performance students. It is important to declare that the previous situation described, accounts for both groups of students in this study.

Another major finding in this study is related to participants' perception on their level of participation in the English lessons. Participants considered that their oral participation did not experience any change in comparison to their performance before the strategy. This perception persisted with no variation before and after the intervention.

This finding may be explained by the fact that both groups of participants were not used to communicating orally, they spoke just when the teacher required them to do it. As the strategy was not monitored individually by the teacher, participants did not feel pressure to discuss the contents in English.

The results also suggested that participants tended to use nonverbal behaviors to communicate during the lessons before and after the intervention during the three lessons. These results coincide with the results of the study of Bambaerero

and Shokrpour (2017), showing that participants engaged in this kind of mobile strategies by working in teams, payed attention purposely and responded with non-verbal gestures in order to be understood (Bambaeeroo & Shokrpour 2017:51).

Lastly, the findings demonstrated that participants' perception in relation to their interest and engagement in the lessons before and after the intervention remained without any change (Heflin, Shewmaker & Nguyen 2017:91). Similarly, researchers such as Liem and Martin (2012), Harris (2011) and Velandia (2008) agree that engagement in learning is closely related to motivation, in which learners are committed to master a task, activity or learning strategy.

In this study, participants did not perceive any change with regard to their motivation or willingness to sustain the strategy, which it was contradictory to the results where students demonstrated that they did change their behavior by improving their willingness to participate during the lessons.

LIMITATIONS

Despite the fact that this study achieved its aims, there were some drawbacks presented during the whole process of researching. Nonetheless, before presenting the limitations of this study, it is important to state that this is an action research study and the results shown here are not generalizable. It is important to take into consideration that action research is conducted to find solutions for certain pedagogical classroom issues that need to be explored and improved; therefore, as findings are not generalizable, the number of participants is not a problem for action research. It allows to work with any number of participants.

Firstly, the findings of this study were restricted by the time constraints and number of participants. Secondly, even though the groups chosen

were ESP both, they had a different focus on the English lessons: Group 1 was an elementary communicative class, while Group 2 was an intermediate communicative business class; and there was a variety of English proficiency levels in both groups: A1 to C1.

Third, there were some technical limitations to the widespread practice of mobile technology as the size of the screen or accessibility and availability of the Internet connection. Since the data was reported merely by the teacher-researcher, there might be potential sources of bias. One instance could be the selective memory that could have influenced the recalling of data while working on The teacher journal.

Lastly, the teacher-researcher was unable to determine which of the three types warm-up strategies (Matching pairs, Memory game and Vocabulary survey) was the most accurate to motivate students and why the students did not perceive any change in their class participation, even though they orally expressed that they enjoyed the strategy.

IMPLICATIONS

Regarding the technological-educational strategy topic, the results established that the Quizizz warm-up strategy supported by the use of smartphones was useful to accomplish the teaching objectives to benefit participants' level of participation. Thus, this study presented a possible useful strategy in order to meet similar issues related to students' participation in the English lessons. It is worthwhile to expand the research with regard to the sources that teachers use in the lesson in order to involve innovative tools to benefit the teaching-learning process of future generations of English students.

This study endeavors to address this topic in order to clarify some misconceptions that teachers and students may have regarding the use of technology or new strategies in the English lessons.

In addition, interesting research questions may arise for future studies that can be derived from the findings of this study, such as:

- 1) What are the factors that engage adults' students to participate orally using a technological strategy?
- 2) How the students' motivation could be maintained after the use of this strategy?
- 3) How this kind of innovation strategies could be incorporated in Chilean classrooms? and
- 4) How to motivate anti-technology teachers to use this technological strategies for teaching?

CONCLUSIONS

First, the findings of a possible modification of the students' participation behavior after the use of Quizizz and smartphones as a warm-up strategy showed that all the students were eager to participate because they expressed that they felt comfortable using the strategy. Second, after the implementation, the students showed a predisposition to work and participate in the lessons because the strategy was entertaining and motivating for them.

Third, the students were active during and after the strategy, thus the intervention facilitated the interactions maintenance even in the next stages of the lessons. On the whole, participants increased their interactions by reinforcing their students-students collaboration while the strategy was being implemented. On the same line, effective lesson planning at the university level is crucial to engage learners and encourage them to participate actively in the lessons. University teachers have to develop the skill of lesson planning for learners that sometimes lack the necessary entry competences. Therefore, the use of ICT can become an effective tool to guide students' learning processes in a context of well-organized and motivating lessons.

Furthermore, this research also pursued to induce the students' awareness on their level of participation in the ESP lessons in order to integrate students in the process of learning. Most students admitted that they usually interacted or participated in nonverbal attentiveness behaviors with or without the use of the strategy, that is to say, students preferred not to speak but to respond with facial expressions or gestures to express that they were paying attention to the lesson, following instructions and understanding the strategy and lesson content.

At the end, participants expressed that the use of Quizizz and smartphones as a warm-up strategy did not have an effect either on enhancing their oral participation or their engagement in the lesson before and after the intervention. However, they also expressed that it happened because of their lack of confidence, shyness and indifference towards the English subject matter.

Even though the results of the observation and The classroom map showed that participants had a slight change on their level of participation and motivation towards the lessons, Quizizz and smartphones as a warm-up strategy did not affect participants' performance and commitment for the lesson before and after the implementation. It is relevant to state that participants misunderstood the meaning of participation, most of them believed that the basis of participation was speaking since they did not relate participation to nonverbal attentiveness behaviors or involvement in the lesson's activities.

After the intervention of this action research project, it is concluded that the teacher's role must be redefined to meet the needs and demands of today's world. Today's teachers have to understand the importance of making education relevant to the students. Besides covering the educational curriculum when planning an educational program or preparing for a standardized English test, teachers should make learning significant and engaging for students to be successful in their professional and personal lives.

Because of the influence of technology and media, students are exposed to an infinite amount of information; this overload of information may

mean that teachers have to prepare themselves as well as constantly update the teaching contents and enhance their technological knowledge to engage the students' attention.

The findings of this study can be understood as valuable data and evidence for a similar educational context, which supports the use of a technological strategy with adults' students. This is relevant for students to participate during the lessons, study hard and succeed in the process of acquiring English. The participants of this study recognized a change in their participation regardless the identified limitations of this study.

Finally, there were found some disadvantages regarding this kind of strategy such as: connectivity problems, accessibility for students who did not own a technological device as a smartphone and the students' proficiency in English, which led some students to be left behind while they were working with the strategy. Despite these limitations, the findings of this study are valuable in the light of the teachers' awareness of these issues and possible upcoming solutions as well as future studies in the field.

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