ABSTRACT

This research aims to improve the work of teachers towards the diversity of students in educational communities. The case study methodology is used to determine the changes in the learning of vocabulary in English as a foreign language in two children aged 11 and 13, diagnosed with hearing loss and communication difficulties. The research team carried out an educational intervention for six months that used word memorization strategies supported by realia and gamification. The instruments used are the semi-structured interview, participatory observation, and the Tevi-R test to monitor the vocabulary acquisition progress of students with hearing impairment. The results show that the memorization strategy improved the informants’ ability to remember a greater number of words learned in English, going from 4 words/session reported in the pre-test to 9 words/session reported in the post-test.
Sociología de la educación

de estudiantes con déficit auditivo. Los resultados muestran que la estrategia de memorización mejoró la capacidad de los informantes para recordar mayor número de palabras aprendidas en inglés, pasando de 4 palabras/sesión reportada en la prueba previa a 9 palabras/sesión reportada en la prueba posterior.

INTRODUCCIÓN

Diversity in educational communities refers to the participation and acceptance of all students in teaching and learning process. Due, Inclusive Education should consider more than curricular or methodological questions. It is a different way of understanding education, emphasizing the philosophy of values for living in harmony inside progressist societies (UNESCO, 2006; Bravo et al., 2021).

The universal declaration of Human Rights established that people worldwide have access to Education of quality without any distinction such as impairments, different origins, culture, ethnic identity, sexual preferences, or catastrophic illness. In the case of Ecuador, the National Constitution of 2008 declared Education as one of the leading social priorities. Thus, the Ecuadorian government promulgated the Intercultural Education Organic Law (2011) for implementing new curricular policies, considering more flexible lesson plans and learners’ needs to improve their individual and group academic development (Corral et al., 2015; Villafuerte et al., 2017; Zandy, 2019). However, the review of teaching practice and inclusive culture evidenced the need for innovating didactics to improve instructors’ work (Rodríguez et al., 2021; Bravo et al., 2021; Pacheco et al., 2022). However, Villafuerte (2022) states that using games in the teaching sequences is pertinent and favors the articulation of the content of the curriculum. Nevertheless, in nations like Ecuador, it is still necessary to get parents to understand that games for educational purposes positively contribute to enhancing attention to the diversity of students.

Besides, this work’s authors’ motivation is to understand better how hearing loss and communication capabilities influence the learners’ EFL acquisition process. Thus, this work aims to provide teachers with valid information for improving students’ attention having the condition of hearing loss.

According to Booth & Ainscow (2001), crucial indexes for determining the evolution of Inclusive Education in a nation are (1) government policies, (2) teachers’ practices, and (3) inclusive culture. In addition, UNESCO (2006) states:

Inclusive Education is the process of addressing and responding to the diversity of needs of all students through inclusive practices in learning, cultures, and communities to reduce exclusion within education. It implies changes and modifications in content,
Inclusive Education aims to overcome the barriers and gaps in educational communities (Bonalts & Sánchez, 2007). Besides, it is a process that responds to the diversity of student needs and contributes to improving learning, culture, and communities free from all forms of exclusion (UNESCO, 2009).

In addition, Inclusive Education means accessing to education of quality, but it is also transforming situations of exclusion (Blanco, 2013). Nevertheless, it demands the social transformation of instructors to assume the challenges of working with students in a condition of disabilities (Moliner, 2013; Corral et al., 2015). Scholars such as Acosta (2013); Moliner (2013); Ramirez (2017) understand the term Inclusion as an attitude based on dialogue, participation, cooperation, requirement, trust, and acceptance of diversity, but it is focused on students having disabilities and refers to people in a general way. Nevertheless, Inclusive Education is still a process in construction. Thus, it is possible to find people who are highly compromised to work on inclusive Education, but others assuming a distant position from Inclusion (Villafuerte et al., 2017). Consequently, it is necessary to permanently revise the inclusive education condition in nations worldwide, expecting to improve its implementation in Education and other public services and socio-economical fields (Bravo et al., 2021).

Hearing loss or hearing impairment is a prevalent condition that affects people worldwide, determining different levels of disability with physical to social and psychological implications (Moliner, 2013). In consequence, it is essentially an early diagnosis for supplying timely treatment.

Knowing the causes and associated risk factors, Muñoz et al. (2014) states that hearing loss is a sensorineural affection with rapid onset in a healthy individual. The etiology can be broad and multifactorial. Most patients do not recover their hearing in its natural evolution, and some may even develop a prognosis of the affected ear. It is also crucial that the treatment and approach of these patients not only be focus on hearing rehabilitation, but also on counseling and education for reaching their social inclusion and good academic results (Diaz et al., 2016).

Hearing loss is an auditory disease that shows a decrease in hearing tone below 20 decibels. Significant hearing impact occurs due to damage inner ear or nerves. Possible reasons that cause it are congenital disability, disease injury, or consumption of dangerous medications. It can occur at any stage of the child’s life, pre, peri, postnatal, or later during his development. Besides, its origin could be genetic. Thus, when parents have a hearing deficit, their children may inherit it. However, children with this deficiency have no evident physical symptoms.
Consequently, types of hearing loss can vary within the framework of classroom communication (Pizarro, 2017).

Concerning the Linguistic approaches, Halliday & Matthiessen (2004) state the contexts’ relevance to understand the terms used in the communication. Therefore, the words exceed the grammatical limit to achieve the transfer of the message (Halliday, 2008). Besides, years of experience confirm that learners’ psychological language acquisition processes are similar in people with or without hearing loss conditions (Domagala et al., 2021).

Besides, scholars such as Krashen (2011) consider that learners with hearing loss can learn about language and acquire a foreign language.

Almurashi (2016) sustains people have an innate predisposition to use rules and language structures of the mother tongue to the target language. However, Chomsky’s theory allowed linguists to create new theories based on teaching foreign languages to students with hearing loss to demonstrate that they can acquire a language even if there is a lack of communication skills (Domagala et al., 2021).

Among the previous works revised in this research, Garayzábal (2009) argues that phonological processes such as elision, language sound frequency, and groupings in each language are overlooked from an evolutionary perspective. In addition, Simonsen et al. (2014) show significant gender differences, mainly in the direction of girls outperforming boys in language acquisition. On the other hand, Perez & Alvira (2017) establish that vocabulary acquisition strategies involve affective and cognitive factors that may cause students to prefer one strategy over another.

This research answers the following questions:

1. What are the EFL instructors’ motivations and attitudes toward working with students with hearing loss?
2. Are the EFL instructors trained for teaching students in a condition of hearing loss?
3. How did learners progress in the EFL vocabulary acquisition when using memory strategies?

This research aims to improve the work of teachers towards the diversity of students in educational communities.

**METHODOLOGY**

The methodology used in this work is case study research. It monitors the evolution of people related on a specific variable (Maldonado, 2018). This research assess the English language vocabulary acquisition progress in two students diagnosed with hearing loss. They took part in an educational intervention considering the participants’ interest in acquiring vocabulary...
in English language, using memory strategies to retain new words and the project-based learning methodology (PBL) for 24 weeks.

**Case study background**

The case study is two students diagnosed with hearing loss who reported difficulties using their cochlear implants. They are a girl from Venezuela and a boy from Ecuador. They both lived in Manta, Ecuador, during the execution of this process. The research team called them “The rocket-boy” and “The Starfire girl” to protect their identity.

The Starfire girl. - She is 14 years old and attends the 10th grade of primary education. She was born in Venezuela, but her family migrated to Ecuador in 2019. Her audition is upper to 70 DBHL and fills into deep. She likes drawing and painting and loves watching anime, exposing her to learning a new language. She always shows a positive attitude toward learning. She shows a delay in communication since she moved from her origin country because her cochlear implant is not working correctly, and she had not gotten assistance for the reparation. She hates to feel the noise people make when they speak simultaneously. Thus, she denies using the device anymore. She prefers to communicate in Spanish with other people using mimics and the assistance of her mother. She created a connection that helped to learn English by using Spanish sign language.

The rocket-boy. - He was eight years old and attended the 5th grade of elementary school. He has a great talent that allows learning quickly, and He likes to learn English language. thus, He had a positive attitude through learning challenges. However, he showed a delay in reading and communicating with others in Spanish. His historical medical files report an audition of around 40 to 69 DBHL with minimal listening. He needs his parents’ and teachers’ permanent stimulation to get better achievement in academic activities to work his communicational deficit. He cannot stand places where there is much noise. he prefers to be alone.

**Instruments**

The instruments used in this research for the collection of information are:

**Interview guide**

This instrument aims to collect information to design an educational intervention for the instruction of EFL to learners with hearing impairment. An expert panel integrated for three professionals with more than ten years of experience in Inclusive Education, Psychology, and EFL instruction evaluated this instrument. They recommended reducing the number of open questions in the initial version to eight questions concerning didactic material, session time,
and motivation for learning strategies. Interviews were executed face-to-face for forty-five minutes. The informants were professionals with more than five years of experience caring for students with disabilities. The research team took notes on paper, due at the request of the interviewees. Researchers executed the interviews at a public university located in Manta, Ecuador.

Observation field daily format

The technique of observation is frequently used in educational research to collect information related to the efficiency of a teaching strategy (Martinez, 2007). The instrument identifies the frequency learners use the new English language vocabulary learned in classes. This instrument was selected following Orellana (2019), concerning field daily allows registering learners’ attitudes and motivation for learning English as a Foreign language. The research team created this instrument to determine participants’ use of memory strategies for acquiring new vocabulary in the English language. In addition, it collects information about the date, sessions, lesson topics, students’ reactions, and correct/wrong use of the vocabulary learned. A panel of experts with more than five years of experience in EFL instruction and educational research evaluated this instrument. They recommended using this instrument permanently during every session from the beginning to the end of the educational intervention.

Revised Picture vocabulary Test (TEVI-R).

This instrument is a standardized test designed by Echeverría, et al. (2002). It determines levels of understanding of EFL passive vocabulary in students with Spanish as their mother tongue. This instrument is widely used in Chile with learners from two and half years old to seventeen years old for assessing the number of new words learners remember in a specific vocabulary. Learners’ progress is represented in a diagram by categories of the topic. Pretest and posttest used this instrument.

Procedures

The procedures executed in the case study are explained below:

Stage 1:

Planning and evaluation of the interview instrument in Jun/2019.

The research team executed the interviews with professionals in inclusive education in July/2019. Interviews took place in a public university located in Manta, Ecuador.

The research team executed a categorical analysis of the information collected in the interviews with professionals in inclusive education in August/2019 and made a chart representing the selected categories’ features. See table 1.
Stage 2:
The research team contacted the participants “The rocket-boy” and “The Starfire girl” in July/2019. They and tutors agreed to participate in this process in August/2019.

Stage 3:
The research team adapted the test Tevi-R to local conditions in Sep/2019. It was used in the pretest in April (2020) and post-test (November/2020) to assess participants’ EFL vocabulary acquisition changes.

Stage 4:
The research team designed the educational intervention in August/2020, and the execution began in September/2020 to finish in November/2020. The researcher team executed observations in every session of the educational intervention.

RESULTS

Results obtained in this research are organized following the logic of the research questions that appear in the section introduction.

In answer to question 1: What are the motivations for a student with hearing loss to learn a foreign language? Researchers present the categorial tree and analysis of the interviews.

Categories and subcategories used in the analysis of information are:

Category 1: Motivations for learning a foreign language. - It is a complex construct that explains the reasons why people decide to take any action, the amount of effort they will devote to it and how much time they will be willing to use to develop that attitude in a sustained way (Chichande Molina, 2021).

Subcategories: Intrinsic motivation, Extrinsic motivation.

Category 2: Attitudes. - Set of reactions people have when they are under the effect of different situation surrounding (Huwari, 2021).

Subcategories: Positive attitude, Negative attitude, Indifferent attitude.

Category 3: Inclusive education. - It is access to education of quality for everybody without any kind of discrimination. Its implementation puts people in a learning environment que consider learners’ needs (Ehala, 2020).

Subcategories: Utopic position, sense of justice position
Category 4: Educational practices. - The most important task of the teacher is to accompany and lead the knowledge of the educator, and the learner is considered as result of a personal relationship of the educator with the learner (Kosmas, 2021).

Subcategories: Personal reasons, and knowledge reasons

Table 1 shows the results obtained in the interview with Ecuadorian professionals of inclusive education, organized according to the categories and subcategories selected.

Table 1.
Students’ motivation and attitudes for learning a foreign language

<table>
<thead>
<tr>
<th>Categories</th>
<th>Evidence</th>
<th>Subcategories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivations for learning a foreign language</td>
<td>E1. 0:18:00 “Depending on learners’ prior knowledge and likes of English language. Listeners must learn it, but not everyone likes it.”</td>
<td>Low intrinsic motivation.</td>
</tr>
<tr>
<td></td>
<td>E1. 0:19:30 “… The same happens with people with hearing loss. If it is within their capabilities, like to learn another language and this also depends on the motivation teacher promote”.</td>
<td>High extrinsic motivation.</td>
</tr>
<tr>
<td></td>
<td>E2. 0:20:30 “Students feel it is more important to know a foreign language than to communicate themselves in another language.”</td>
<td>Low intrinsic motivation.</td>
</tr>
<tr>
<td></td>
<td>E2. 0:22:10 “It is a valuable load of motivation”</td>
<td>High intrinsic motivation.</td>
</tr>
<tr>
<td>Attitudes for learning a foreign language</td>
<td>E1. 0:20:20 “For students with hearing impairment to feel rejected, to feel a look of rejection from a teacher can be a collapse”.</td>
<td>Negative attitude.</td>
</tr>
<tr>
<td></td>
<td>E1. 0:15:10 “… knowing or having another language as a strength ensures that they become more visible.”</td>
<td>Positive attitude.</td>
</tr>
<tr>
<td></td>
<td>E2_0:12:00 “It is difficult to have real inclusion”</td>
<td>Negative attitude.</td>
</tr>
<tr>
<td>Public policies related to inclusive education</td>
<td>E3_0:10:00 “Inclusion is for everybody; it represents education of quality”</td>
<td>Sense of Justice position.</td>
</tr>
<tr>
<td></td>
<td>E2_0:12:00 “This was supposed to be a utopia that students with educational disabilities were included in regular education. Is still a dream”.</td>
<td>Utopic position.</td>
</tr>
<tr>
<td></td>
<td>E2_0:16:00 “students with educational disabilities should be included in regular education in all the country”</td>
<td>Sense of Justice position.</td>
</tr>
<tr>
<td></td>
<td>E3_0:16:00 “Education laws make no difference for people with disabilities. Therefore, they must pass the subjects”.</td>
<td>Sense of Justice position.</td>
</tr>
<tr>
<td></td>
<td>E1:17:06 “Watching students” is possible to find their talent and capabilities. It is a good personal initiative.”</td>
<td>Personal reasons</td>
</tr>
<tr>
<td>Educational practices</td>
<td>It is necessary to implement adaptations to help to students with disabilities”</td>
<td>Knowledge reasons</td>
</tr>
<tr>
<td></td>
<td>E1:17:06 “Teachers use frequently innovative didactics for supporting students with disabilities”</td>
<td>Knowledge reasons</td>
</tr>
</tbody>
</table>

Source: Interviews to experts in inclusive education.
In answer to question 2: How did learners progress in vocabulary learning? The figure 1 shows the participants’ vocabulary acquisition progress before and after the educational intervention.

**Figura 1.**
*Learner’s progress by lesson topic.*

![Graph showing learner's progress by lesson topic](Resource: project registers (2021)).

**DISCUSION**

Based on the analysis of the results obtained in this case study, the authors found that memory strategies articulated to realia and gamification could improve the EFL instruction of learners with hearing loss and communicational deficit. Consequently, memory strategies could enhance the work with diverse students in educational communities.

This research showed that teachers of English as a Foreign language could increase the number of words learned by students with hearing loss and communication deficiency. The Rocket-boy. - The case study (boy) reported retaining four vocabulary words in English at the beginning of the process. The Rocket-boy faced frequent distracting situations presented in his everyday learning environment. Such conditions required creating new graphic material to support teaching on the last sessions of the educational intervention. These didactic materials supported the Rocket-boy’s memory, increasing his periods of attention and the number of retained vocabulary words from 4 to 7 words per session.

The Starfire girl. - The case study (girl) reported retaining six vocabulary words in English at the beginning of the process. The research team exposed her to practice that combined memory strategies with sign language in Spanish quickly. When she communicated in the English language, she related and used the new vocabulary very frequently. The use of memory...
strategies increased her number of retained vocabulary words from 6 to 9 words per session. Such conditions helped create a new approach to acquiring sign language in English.

The results found in this research are coherent with the position of the scholars Holliday (2008); Garayzábal (2009); Simonsen et al. (2014) when they state that the acquisition of a language is directly related to the learners’ context. Thus, the participants in this case study could understand the use of words in concrete situations. Consequently, the findings remark on the necessity of improving learning environments to reach learners’ higher levels of learning.

The evidence allows the authors to agree with the position of Perez & Alvira (2017) when they affirm that vocabulary association with pictures (realia) stimulates visual learners to memorize more new words because they see or imagine an object, doing a more memorable experience. In addition, learners retrieved the vocabulary easily from their long-term memory into working memory. Thus, this case study proposes the intensive use of realia as an efficient memory strategy to acquire vocabularies such as word cards, association with images, and association with a topic. Games shown in this case study, are very effective for vocabulary acquisition. Games helped instructors to create the appropriate contexts to introduce new terms in EFL class. Besides, games allow learners to relate and use the range of words progressively and improve the capacity to remember the language learned.

The present work achieved participants remember the 90% of the new vocabulary in English. However, they had difficulty pronouncing because they could not hear when the instructor introduced the words, and their repetition became very difficult.

Besides, the research team found the results coherent with Orellana (2019); Pacheco et al. (2022), concerning the learners’ stimulation using games and movement. Thus, didactic material using realia and gamification should be intended to develop perception and receptive skills and visual kinaesthetic, which play a fundamental role during the integral development of language and contribute positively to the learners’ vocabulary acquisition improvement.

In addition, the authors agree with Rosales et al. (2020), who affirms that girls can reach a more advanced linguistic level related to human lexical competence. In other words, the research team observed that the girl stopped using sign language to repeat the new words presented in the educational intervention vocally. Such conditions demanded to be making new adjustments to the educational intervention to achieve better results of communications.

Among other findings detected in this research, authors remarks on the high vulnerability of migrant students in Ecuador, and their poor situation is more complex when they have a condition of desability. Such a condition is coherent with Krashen’s affirmation (2011) when he states the need to save kids from poverty. Thus, people in the condition of migrants in Ecuador have no economic means. They have limited access to social assistance services that
are also scarce in Ecuadorian society, such as the maintenance of the cochlear device and medical monitoring of hearing loss with emotional stress due to their device’s damage.

The authors present recommendations for teachers to improve their practice based on the observations.

a. Lip-reading:
Sunlight or artificial light must hit the face of the speaking person because learners with hearing loss can perceive instructors’ features, reads lips, gesticulation, and articulate.

The voice of students in a condition of hearing loss is usually high volume because only in that way do they manage to feel the vibrations of their voices.

Students make repetitive mistakes due to the difficulty of pronunciation of sounds such as -sh, ch, x, and th- in the English language

b. Comprehension:
Teachers should vocalize the best as possible because students with hearing loss always tend to lip-read. That is their most common way of communication, followed by signs interpretation and technological devices.

A teacher should use didactic material colorful to motivate students to learn. Teachers should use pictures, videos, or objects (realia) when introducing new vocabulary because conceptualization is the most challenging problem for students with hearing loss conditions.

Using realia (natural objects) contributes notoriously to students with and without hearing loss understanding new vocabulary in their mother or foreign language.

c. Writing:
It is necessary to show the articulations (hands language) in both languages so that you can also handle some signs with your hands and little natural objects.

Reinforcing Writing through guided tutorials to present examples of new vocabularies.”

The use of graphics or photographs is beneficial to convey new vocabulary when practicing Writing.

Working with videos promotes learning new topics by exposing learners to images of different contexts. Examples can be videos of locations like the beach, the park, the zoo, and the airport. Here, the ICT gives essential support to bring scenes to the classroom.

To summarize, the authors recommend improving teachers’ inclusive practice by following this route:

1. It is necessary to create didactic material extra to improve the instruction of learners with a hearing loss condition.
2. To promote realia and gamification strategies in the instruction of students with a hearing loss condition. This situation demands teachers more time of dedication. However, improving learners’ explanations and participation with and without sensory deficits is necessary.

3. A teacher should create more secure, friendly, and positive learning environments to expand the attention of diversity in educational communities.

Finally, the research team also remarks on the necessity to review the Ecuadorian national curriculum, in which all students with or without a condition of hearing loss and other disabilities have a mandate to approve the subject of English as a Foreign Language. This scenario allows authors to remark on the pertinence of this work to create didactic material, propose teaching strategies, and encourage teachers to analyze the students’ socio-economical and health conditions to improve their contribution to the diversity of the educational communities.

CONCLUSION

Based on the theoretical review and analysis of the information collected in this case study, the authors declare the fulfillment of this work’s aims. The results show that the case study informants increased the number of new words retention and recall for more time when they were exposed to English as a Foreign Language practice using realia and gamification as strategies for acquiring vocabulary. The main contribution of this work focuses on the proposal that the combination of the memory strategies with realia and gamification allows the creation of more interactive classes, which can improve the communicational students’ skills in the diversity of the educational communities.

This work introduces the research line: teaching practice for English Language Instruction to learners with a hearing loss condition as active members of educational communities. The weakness of this research work is probably the corpus size, which is insufficient to present any generalization. However, the results allow EFL instructors to learn about the experience of teaching EFL to students with hearing loss and communicational disability in a formal education scenario. Finally, the authors invite other researchers to conduct new studies on memory strategies for learners with and without disabilities.

ACKNOWLEDGMENT:

The contribution of the projects that made the realization of this work possible is appreciated:

(a) Proyecto Interdisciplinario de Alfabetización Integral con Componentes de Gamificación para el Desarrollo Sostenible de Niños, Jóvenes y Adultos mayores de Manta, Ecuador. Prof. Cinthya Zambrano at ULEAM. Manta-Ecuador.
(b) Research project of ULEAM Chone: Propuesta de adaptación curricular en la enseñanza del idioma inglés para la inclusión de estudiantes con necesidades educativas especiales auditivas, de las unidades educativas de Chone y Manta. Prof. Victoria Andrade at ULEAM. Chone-Ecuador

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<td><strong>Carlos Moreira</strong></td>
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