Braille reading and writing as an innovative strategy

in the English second language

Angel Tellez Tula

angel12.tellez@gmail.com

https://orcid.org/0000-0002-7925-9271

Efraín De Jesús Castro González

e.bendone@gmail.com

Benjamín Gutiérrez Gutiérrez

Gutierrezgutierrezbenjamin@gmail.com

https://orcid.org/0000-0003-2716-9108

Tutalani I. Asino

tutaleni.asino@okstate.edu

Secretaría de Educación Pública,
Benemérita Universidad Autónoma de Puebla,
& Oklahoma State University
Puebla, México

ABSTRACT

Cabe destacar que hubo una revolución completa en la educación y un cambio de paradigmas como la enseñanza remota de emergencia. A nivel mundial, las escuelas cerraron las puertas e implementaron la enseñanza remota de emergencia. Sin embargo, las barreras y la adaptación en la educación se han hecho evidentes en varios países, incluido México. Este estudio de investigación de métodos mixtos fue una forma de analizar el uso de Braille en el aula de inglés. Por lo tanto, el presente estudio es una investigación de métodos mixtos que utiliza dos formularios de Google Doc para recopilar datos cuantitativos y narraciones escritas, los datos cualitativos, como instrumentos de investigación. Específicamente, debido a la pandemia de Covid-19, el estudio se realizó de manera virtual durante los meses de noviembre-diciembre (2020), febrero y marzo (2021). Los hallazgos de este estudio mostraron una aceptación del uso de Braille en el aula de inglés. El objetivo de este estudio es comprender cómo los estudiantes de secundaria perciben el uso de un convertidor Braille como técnica didáctica para mejorar su aprendizaje de idiomas en un entorno de aprendizaje virtual.

Keywords: *educación inclusiva; braille; elt; convertidor de braille; concurso de decodificación braille*

La lectura y escritura braille como estrategia innovadora en la Segunda Lengua Inglesa.

RESUMEN

Cabe destacar que hubo una revolución completa en la educación y un cambio de paradigmas como la enseñanza remota de emergencia. A nivel mundial, las escuelas cerraron las puertas e implementaron la enseñanza remota de emergencia. Sin embargo, las barreras y la adaptación en la educación se han hecho evidentes en varios países, incluido México. Este estudio de investigación de métodos mixtos fue una forma de analizar el uso de Braille en el aula de inglés. Por lo tanto, el presente estudio es una investigación de métodos mixtos que utiliza dos formularios de Google Doc para recopilar datos cuantitativos y narraciones escritas, los datos cualitativos, como instrumentos de investigación. Específicamente, debido a la pandemia de Covid-19, el estudio se realizó de manera virtual durante los meses de noviembre-diciembre (2020), febrero y marzo (2021). Los hallazgos de este estudio mostraron una aceptación del uso de Braille en el aula de inglés. El objetivo de este estudio es comprender cómo los estudiantes de secundaria perciben el uso de un convertidor Braille como técnica didáctica para mejorar su aprendizaje de idiomas en un entorno de aprendizaje virtual.

Palabras clave: inclusive education; braille; elt; braille convertor; braille decoding contest.

INTRODUCTION

Globally, blind and visually impaired people exist in every society. "The estimated number of blind persons increased (by 42.8%) from 34.4 million in 1990 to 49.1 million in 2020 yet global all-age age-standardized prevalence of blindness decreased between 1990 (0.85%; 95% UI:0.68%-1.1%) and 2019 (0.60%; 95% UI:0.48%-0.75%)" (Bourne et al., 2020, Results). In consequence and unfortunately, children are not the exception. Regarding Blind people, there were efforts to help Blind people in society. Braille is very effective for communication between visually impaired and sighted people.

Understanding how secondary school students view using a Braille converter as a didactic approach to enhance their language learning in a virtual learning environment is the main goal of this study. This study reports the findings of using the Braille code and the ELT teaching-learning process. This study occurred among 79 participants in a public junior high school (secondary) in Puebla, Mexico. Furthermore, the study created the First Virtual Braille Decoding Contest in English. There is a large amount on the benefits of using Braille in education in developed countries to be very specific, in English teaching-learning (Farani & Aryanti, 2016; Özer & Cabaroğlu, 2018; Sester & Lopes, 2017).

For visual people who cannot read Braille, exchanging information with blind people is difficult. Marcet et al. (2016) states that "The Braille system, designed by Louis Braille in 1825, is based on a grid of six tactile dots presented in two parallel columns of three dots each. The combination of these six tactile dots signifies a specific letter" (p. 812). However, there is a limitation to research conducted in Mexico. The current study will help to enrich and provide a better scope on blending English language teaching with Braille. This research aims to understand students' perceptions when using a Braille converter as a didactic strategy to teach (visual) secondary education students to enhance their learning regarding language skills in virtual education.

Inclusive education

According to Kirschner (2015), "Inclusive education is an approach to schooling in which students with many different kinds of disabilities and learning needs are educated in classes with non-disabled and typically developing students" (p. 1). In particular, Mexico has taken a specific path to achieve good results. However, it has faced several challenges; to advancing Education Reform in order to achieve greater quality with equity and inclusion in the education system

In summary, as claimed by (García-Cedillo et al., 2014)to expand and improve services, Mexico requires intense and well-organized training programs for general and special education professionals and the opening of working positions for exceptional education staff.

The use of Braille in the ELT

Individuals with blindness and visual impairments face numerous barriers. Specifically, going to areas related to social and emotional development. The teaching of a foreign language to students presents some peculiarities. An essential criterion is that there has not been much research in a macro and micro context to address specific singularities. However, with all the efforts made, we must be aware that the teaching of a foreign language is not an advantage for blind students but a fundamental educational right.

Kocyigit & Sabuncu (2015), conducted a case study focusing on the process of visually impaired learners and their teachers when studying a foreign language. Furthermore, the case study focused on the process with sighted students (i.e., in an inclusive/regular education setting). Unambiguously, the data obtained from the interviews with visually impaired students showed that the experiences of both sides used "challenge" as the keyword to describe the process of learning English. Additionally, in the same study, Kocyigit & Sabuncu found particular strengths that implemented the process smoothly due to the agents involved in the research: the visually impaired students, teachers, parents, and their school (2015, p. 5, Conclusion, para. 1).

Justification

There is a need to establish a culture of value and acceptance based on public education. Looking at visually impaired groups is just the tip of the iceberg when guiding students into different ways of looking at people and how to relate with them. Students need more opportunities to explore the different communities that constitute minorities in society to exercise empathy, create bridges, and expand their action scope. Precisely, the word inclusion sounds convincing in education programs. However, to achieve more outstanding quality with equity and inclusion in the educational system, it is necessary to reinforce the transforming role of education. This research intends to provide a beginning point to use an uncommon strategy, to test its effectiveness, and in further time use them in impaired people.

The use of Braille in teaching English in Mexico is not well-researched. There has been research in higher education where blind individuals have successfully completed a BA in English teaching program (Quiroz & Palmeros, 2016). According to new research conducted at la Universidad de Colima, Mexico, Ramos-García et al. (2022) cover the design and development of a cheap and user-friendly refreshable single-character Braille display using Internet of Things (IoT) technology (p. 1).

The aforementioned instances show the need for participation and for addressing the issue of researching blind people in Mexico. There haven't been many studies conducted in Mexico, but the Emergency Remote Teaching (Aprende en casa) program Mexico implemented helped to bring to light the country's educational deficiencies. However, if there was a segmentation for blind people, the difference would only widen further and the scant study on this population serves as a reliable indicator.

Research question

The specific research question of this research is set out below.

1.- How can a Braille converter be a strategy for teaching a foreign language to secondary school visual students to improve their learning regarding language skills?

METODOLOGÍA

For this study, four subjects were selected from one of the researchers' English conversation clubs, employing a mixed-methods approach. According to research, "mixed-methods studies can help to confirm or cross-validate relationships discovered between variables, as when quantitative and qualitative approaches are compared to see if they converge on a single interpretation of a phenomenon" (Fraenkel & Wallen, 2008, p. 588).

The central postulate of mixed-methods lies in the feedback of qualitative and quantitative methods within a single and coherent methodological perspective, which would allow a level of understanding of the research object (and, therefore, of the results) closer to the complexity of the phenomenon. (Moss, 1996, pp. 20-28)

The study followed an explanatory design. In research from Fraenkel & Wallen (2008), they mention that in this design, researchers first use a qualitative method to discover the essential variables underlying a phenomenon of interest and to inform a second quantitative method. Next, they seek to find the relationships among these variables. The general purpose is to relate the use of a Braille converter as a didactic technique in the

teaching-learning of English in a virtual learning environment. The technique to analyze the data was developed by Hernández, Fernández & Baptista (2006), a technique that consists of data triangulation, involving the data of the object of the study, researchers with expertise in the field, and the researcher.

Instruments and Data Collection Procedures

The data for this study is collected with 3 online surveys using Google Docs forms. Zhang (1999) mentioned that web-based survey tools have transcended their predecessors and are applied in almost all fields of study to conduct research. A first demographic questionnaire was applied at the beginning of the research to obtain demographic information like participants' age, year in school, gender, and years of studying English. Furthermore, the instrument also gathered students´ perceptions of Braille (blending Braille in English, willingness to learn English, and is conducive or harmful to learning Braille while learning the English language). The instrument was elaborated in Google Doc forms and contained 18 questions, most closed-ended questions. A total of seventy-nine participants responded to the survey.

The following sections describe in detail the procedure:

The researchers emailed a questionnaire that included questions on respondents' demographics and opinions on Braille in the ELT.

The researchers sent a questionnaire that asked for demographic information and their perceptions about Braille in the ELT.

The researchers sent a questionnaire after an event (Braille competition) was conducted using Braille to analyze if students' perceptions changed toward using Braille in the ELT.

The researchers analyzed two narratives from two winners of the First Virtual Braille competition.

The study occurred over four months (November, December, February, and March) in 2021. Essentially, the platform used was Edmodo, and the platform helped to upload a reflection based on a Braille phrase. To be very specific, six-morning groups were involved, and three-afternoon groups participated in the current research; three questions were responded to make students reflect. **The questions are marked below:**

- What do you think of the statement? (2 lines)
- What meaning do you give to the statement in your life? (2 lines)
- How can we carry out what you learned in the sentence in practice? (2 lines)

As a consequence, the students had the instructions to write a paragraph. However, the researchers analyzed that students needed a word bank to create their reflective paragraphs. Finally, a rubric was included based on a self-assessment reflection sheet.

After some time using and translating Braille statements into written English, a Braille competition took place and requested ten activities from the students in one month. Subsequently, during the Braille competition, the researchers sent a survey to the students to analyze their perceptions, opinions, and attitudes after the competition. On August 28, 2021, the First Virtual Braille Decoding Competition in English virtually took place in the state of Puebla, Mexico. The competency had a group of three English teachers, ten junior high school students from Técnica 61 (out of the 79 participants), and a prestigious jury from Mexico, Brazil, Finland, and the United States of America. The students used their knowledge to decode English phrases in English. In other words, it was hands-on action to learn a foreign language.

Finally, three students wrote a narrative about their participation in the First Virtual Braille Decoding Competition in English. The narratives are based on their perception of the involvement in a Braille- English contest. The question is cited below..

What is your experience participating in the First Braille decoding contest had on your academic and personal life?

The reflection was sent in a word document in September 2021. Three students submitted it to one of the researchers using the Edmodo platform. **Research from Mendieta (2013) mentions the following:**

In narrative studies, a constant dialogue between researchers and teachers (or other school actors) is generated so that they can both, in light of their understandings of particular teaching and learning situations, collaboratively re-construct and make sense of what happens inside and outside the classroom. (pp. 139-140)

Research context

The Secundaria Técnica 61 is located in San Martín Texmelucan de Labastida, Extension Pino Suarez No. 1, Colonia La Purísima. The institution has a morning shift number of 749 from 14 to 15 years old and a population of 542 students on the afternoon shift. For the current study, 79 participants participated. Their current language is Spanish, and they are learning English as a second language. The context will be as follows: semi-urban, and

the socioeconomic level will be medium-low. Most of the families are merchants. San Martín Texmelucan is located in one of the biggest markets in Latin America.

The researchers selected the students over one year. One of the main reasons the participants were chosen was because they will be the students in each classroom with unique characteristics to identify Braille symbols faster. Similarly, considering the ability of the subjects to participate in learning a second language. A consent letter before the research took place was sent to the parents and had the approval of the principal of the school where the study took place; it gave detailed information about (the purpose of the study, the Braille competition, the purpose of the study, and the timing).

Procedure

An Online Braille Converter that uses English Braille is the primary tool for this action plan. The system recognizes words and, using algorithms, translates them into Braille. The English language teachers can download the phrases in four different styles of Braille conversion. Essentially, the platform used is Edmodo, on November, December, February, and March. The platform helped to upload a sentence of reflection. Six-morning groups were involved, and three-afternoon groups participated in the current research; they used three questions to make students reflect.

RESULTS AND DISCUSSION

Table 1

First Virtual Braille competition in English

Session	Date	Participants	Activity	Modality	Tool	Objective
18 Braille Sessions	Nov. (9-13) Mar. (22- 26)	79 students	Decode Braille	Asynchronous	Edmodo	Write a reflection
	Nov. (9-13) Mar. (22- 26)	79 students	Write a reflection	Synchronous	WhatsApp	Verify velocity

Table 2 . *Gender demographic information*

Age	
Age	Number of students
13 years old	one student
12 years old	68 students
11 years old	ten students

The table above mentions the aging group information about the 79 participants. The participants ranged from age of 13 years old to 11 years old. The average age is 12 (68-year students). In addition, there were 10 (11-year students). Finally, the lowest aging population is 13 years old (one year student).

Table 3 . *Do you think that the use of Braille can be a teaching and learning tool in English?*

	The number of students	Percent
Yes	36	45,6%
No	4	5,1%
Maybe	39	49,3%

The data mentioned above was extracted through Google Docs. It reveals information about using Braille as a teaching and learning tool. At first, there were 6 participants (45,6 %) who shared that Braille can be used as a teaching and learning tool. However, there were 4 participants (5, 1%) who thought that it could not be used as a learning tool. Finally, there were 39 participants (49, 3%) who were neutral on using Braille as a teaching-learning tool.

Table 4 . *Would you be willing to learn Braille?*

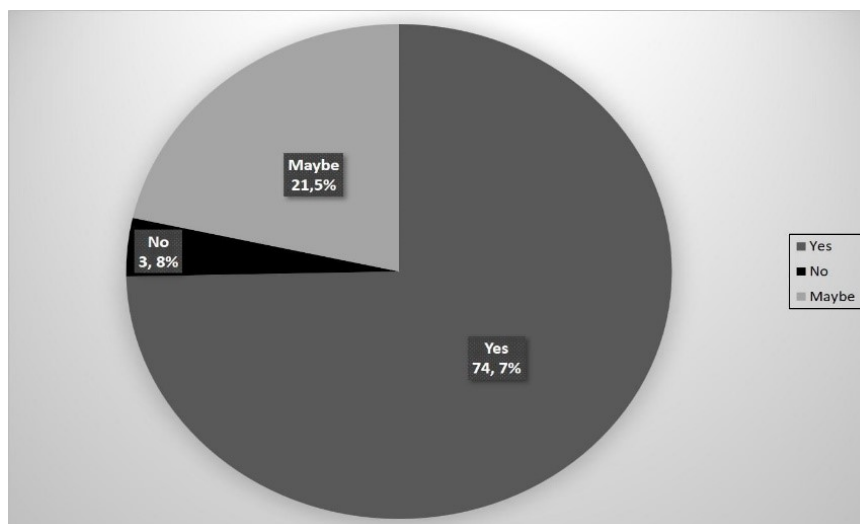|	The number of students	Percent
Yes	54	68,4%
No	4	5,1%
Maybe	21	26, 6%

 The data mentioned above was extracted through Google Docs. It reveals information about the willingness to learn Braille. There were 54 students (68,4 %) that would be willing to learn Braille. In addition, there were 4 students (5, 1%) who were unwilling to learn Braille. Finally, there were 21 students (21, 6%) that shared that they are neutral on their willingness to learn Braille

Table 5. *Do you think it is beneficial or harmful to learn Braille while learning the English language?*

	The number of students	Percent
Beneficial	75	94,9 %
Prejudicial	4	5,1%

The data mentioned above was extracted through Google Docs. It reveals information about the nature of learning Braille while learning the English language. There were 75 students (94.9%) who thought that the ability to read Braille would help be beneficial. However, there were four (5, 1%) students who mentioned that it would be harmful to learn Braille while learning the English language.

Graph 1 .*Do you think that the use of Braille can be a teaching and learning tool in English?*
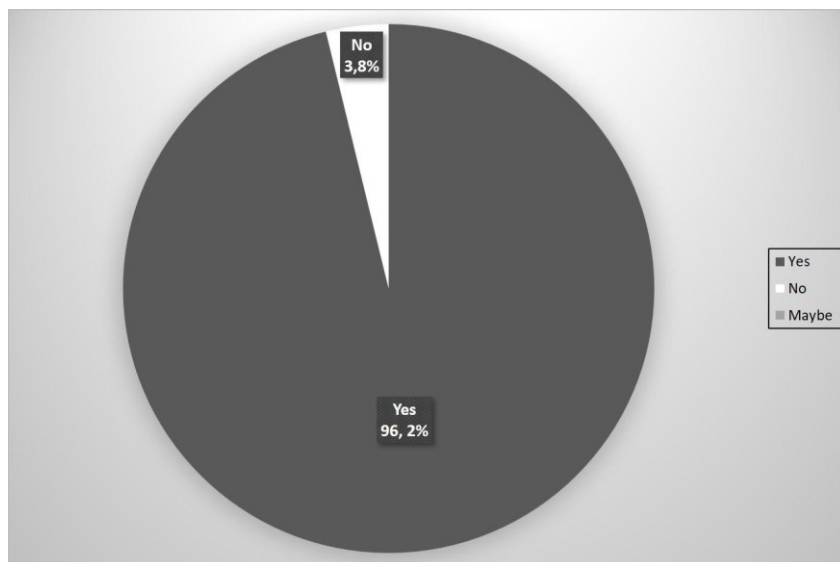

The data was extracted through Google Docs. It reveals information about using Braille as a teaching and learning tool. At first, there were 59 participants (74,7 %) who shared that Braille can be used as a teaching and learning tool. However, there were 3 participants (3, 8%) who thought that it could maybe be used as a learning tool. Finally, there were 17 participants (21, 5%) who were neutral on using Braille as a teaching-learning tool.

Graph 2. *Would you be willing to learn Braille?*
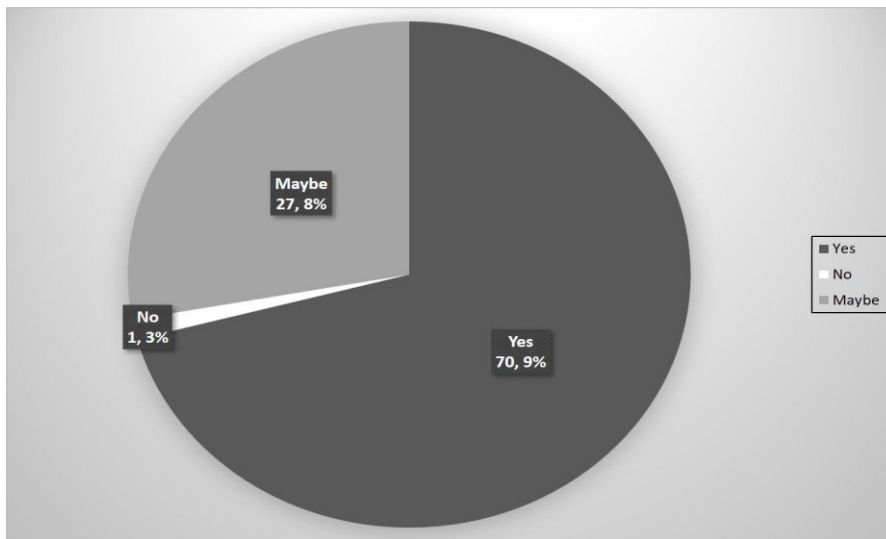
The data revealed information about the willingness to learn Braille. There were 56 students (70,9 %) that would be willing to learn Braille. In addition, there was 1 student (1,3%) who was not willing to learn Braille. Finally, there were 22 students (27,8%) that shared that they are neutral on their willingness to learn Braille

Graph 3. *Do you think it is beneficial or harmful to learn Braille while learning the English language?*

The data shown above was extracted through Google Docs. It reveals information about the nature of **learning Braille while learning the English language.** There were 76 students (96,2%) who thought that the ability to read Braille would help be beneficial. However, there were 3 students (3,8 %) who mentioned that it would be harmful to learn Braille while learning the English language.

Analysis of the narratives.

The stories of two of the participants were requested. The students sent their narratives after the competition. The question is cited below:

What impact did it have on your participation in the First Braille decoding contest in your academic and personal life?

P.1. First prize winner.

The impact that participating in this Braille contest had on my life is significant since it gave me the opportunity to learn a new language, and I was able to reinforce the value of empathy and the teaching of English.

P.2. Second prize winner

In my point of view, I feel that it is beneficial to learn Braille together with English since we will not only learn a language but we will also learn a new language.

P.3. Third prize winner.

It helped me to practice English and a new form of communication that I did not know in English. It helped me to learn to write words correctly to pronounce them more fluently.

P.4. Fourth prize winner

I think it was a good experience to know more about this modality, one of its advantages is that I learned to assess things that we did not notice importance, I learned to use the Braile well and I had an application of my knowledge in English.

The previous narratives mention that learning Braille (had significance in students' life to learn a new language they believe is beneficial *to learn Braille with English,* practice English and a new form of communication, and asses the importance to learn Braille. The following answers were from the first winners. There were also negative responses. However, because of the lack of space, only the positive response will be outlined. A study conducted in 2012 in the United Kingdom using the adoption of the Unified English Braille (UEB) code found that overall, participants were able to read and understand the UEB samples and identified various advantages and disadvantages of the code (Cryer et al., 2013).

CONCLUSION

The present study showed that there seems to be a real opportunity for blending Braille as an activity that can be used in the English classroom. As mentioned, there is not much research on using Braille in English language teaching in Mexico. In many cases, there has

been some research in higher education on how blind students have managed to study for a BA in English teaching (Quiroz & Palmeros, 2016).

However, this study tried to start with basic education (high school students) to generate awareness of students with special needs at an early age. Specifically, in basic education, students need more opportunities to explore the different communities that constitute minorities in society to exercise empathy, create bridges, and expand their action scope. The data revealed that 79 participants mentioned their willingness to learn Braille. There was a slight increase in the willingness from the first and the second survey. The data shows 54 (68,4%) - 56 (70,9%).

Furthermore, the participants agreed that Braille is beneficial while learning English. The results showed that in the first survey, out of 79 participants, only 4 (5,1%) of the students said it would be harmful to 3 (3,8%). On August 28, 2021, the First Virtual Braille Decoding Competition in English, this contest was held in Puebla, Mexico.

The competition was organized by a group of three English teachers, ten junior high school students from Técnica 61, and a prestigious jury from Mexico, Brazil, Finland, and the United States of America (what started as a strategy ended up being a product). Finally, this competition will be the counter-stone to many English teachers as an inclusive tool to motivate students to learn the English language by using Braille.

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