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Teaching a Second Language to Students with Down Syndrome

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Resumen

El propósito de la presente síntesis de investigación fue reconocer que estrategias son útiles para enseñar una segunda lengua a estudiantes con síndrome de Down. Para esta síntesis exploratoria de investigación bibliográfica, veinte y dos estudios de investigación empírica fueron seleccionados por medio de fuentes en línea y a su vez categorizados de acuerdo a los objetivos de esta investigación. No hubo limitaciones relacionadas al diseño o año de publicación de los estudios seleccionados. Para lograr el propósito de esta investigación, las estrategias para enseñar una SL a estudiantes con DS, los efectos de cada tipo de estrategia, y las percepciones de los profesores sobre la enseñanza de una SL a estudiantes con DS fueron analizados. Los resultados revelaron que varias estrategias fueron efectivas al enseñar una segunda lengua a estudiantes con DS. Por lo tanto, estas estrategias fueron organizadas en categorías más pequeñas tales como: intrínsecas, extrínsecas, tecnológicas, y motivacionales. Además, los resultados demostraron que los estudiantes con DS pudieron aprender una SL mediante la aplicación de distintas estrategias de enseñanza. Por consiguiente, las estrategias predominantes fueron las intrínsecas y motivacionales. Asimismo, con respecto a las percepciones de los profesores, esta investigación resaltó la importancia de la formación, las adaptaciones curriculares, el trabajo colaborativo, el ambiente del aula y la motivación.

Palabras clave: Síndrome de Down (SD). Segunda lengua (SL). Estrategias. Trastorno del lenguaje. Trastorno. Educación inclusiva.



Abstract

The purpose of the current research synthesis was to recognize what strategies are helpful to teach a second language to students with Down syndrome. For this exploratory bibliographical research synthesis, twenty-two empirical research studies were selected by means of online sources and categorized based on the aims of this paper. There were no limitations related to the design or year publication of the selected studies. In order to address the purpose of this research synthesis, the strategies to teach an SL to DS students, the effects of each type of strategy, and teachers' perceptions about teaching an SL to DS students were analyzed. The results revealed that various strategies were effective when teaching an SL to DS students. Therefore, these strategies were organized into shorter categories such as intrinsic, extrinsic, technological, and motivational. Moreover, the results demonstrated that students with DS could learn an SL by applying different teaching strategies. Thus, the most predominant teaching strategies were intrinsic and motivational. Also, regarding teachers' perceptions, this paper remarked the importance of training, curricular adaptations, collaborative work, classroom environment, and motivation.

Keywords: Down syndrome (DS). Second language (SL). Strategies. Language impairment. Disorder. Inclusive education.



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Diego



Dedication

I dedicate this paper to my beloved brother, Oliver, who has been my partner and best friend since the day I was born, the one who is very proud of me no matter what. I am grateful for his willingness, support, and advice in my academic, professional, and personal life.

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First of all, I want to thank my beloved ones, family, and friends for their continuous support, love, affection, and for always helping me make the right decisions.

I dedicate this effort to any teacher, researcher, or student who finds this research study fruitful for their convenience and purposes.

Diego



Introduction

Some time ago, learning a second language was not an accessible option for students with DS. Learning a first language was already seen as an arduous task, so an SL was considered almost impossible (Bird et al., 2005). Nevertheless, many research studies developed in different languages have proved that they can do it; even though, as Bernie-Smith, Patton, and Kim (2006) mentioned, their learning process is slower than regular students. Knowing an SL has many different advantages such as job opportunities, communication, increase of cultural awareness, etc. For that reason, Morales (2017) claimed that the lack of research in this area should not exclude DS students from the good outcomes of learning an SL. However, there is not a specific strategy that works perfectly on teaching an SL to DS students, for that reason it is important to study this issue and identify the most suitable strategies (Melero, 1999). Therefore, in order to offer a good SL education to this vulnerable group, this study attempts to find what strategies are useful to teach a second language to students with Down syndrome by answering the following questions:

1. What are the applied strategies to teach a second language to students with Down syndrome?
2. What are the effects of each type of strategy on Down syndrome students learning a second language?
3. What are the teachers' perceptions about teaching a second language to students with Down syndrome?

The current research synthesis is organized in six chapters beginning with the background, statement of the problem, rationale, research questions, and objectives, which shape chapter one. Chapter two includes the theoretical framework and indicates key terms and definitions from a variety of authors regarding the topic of the study. Chapter three



contains the literature review which provides a description of the most relevant information from the selected studies in order to answer the research questions. Furthermore, chapter four presents the methodology used for this study. Next, chapter five shows the data analysis divided into tables with their corresponding descriptions. Finally, chapter six includes the conclusions and recommendations of this research synthesis followed by the references and appendix.



CHAPTER I

Description of the research

Background

Down syndrome (DS) is a disability that affects people of all races, economic settings, or geographical areas. Children with this condition are born in monolingual, bilingual, and multilingual families (Kyffin, 2018). Unfortunately, research about the bilingual development of DS students is minimal (Bird et al., 2005). However, research studies like the ones carried out by Sicilia (2017) and Gràcia (1999) indicated that children with DS could successfully learn two languages or more.

Vallar and Papagno (1993) reported a trilingual Italian woman, referred to as FF. The native language of FF's parents was Italian, but her father was also fluent in English. As a child, she attended an Italian school where she learned English and French. She had a good level of conversation and understanding in Italian and English, but she was less proficient in French. An examination of her cognitive abilities in her first language (L1), Italian, demonstrated good acquisition of language and vocabulary, despite widespread cognitive impairment. Therefore, this study showed that individuals with DS were able to learn more than only one language and that exposure to more than one language did not have detrimental effects on their L1.

Another published study of DS individuals learning two languages, which took place in London - England, reported the case of two twins with DS born to deaf parents. The twins' mother became deaf when she was seven because of meningitis, and their father's deafness was of unknown origin. The twins could communicate in English orally and use sign language. They conveyed messages orally in English, and they also used British Sign



Language (BSL). BSL was the primary language for the family, but the twins also used English to talk with each other. The results demonstrated that the two participants showed similar DS impairments in both ways of communication, orally and using the BSL. Additionally, although the twins preferred to communicate orally in English, they could learn and communicate with their parents by using BSL. This fact confirmed that even with their disability, people with DS are able to learn more than one language (Woll & Grove, 1996).

Bird et al. (2005) reported the language profile of eight bilingual children with DS. All the participants' native language was English, and the majority of them had French as their second language (SL). Their performance was compared with 14 monolingual children with DS. In the end, the results demonstrated that DS children can learn more than a language and that an SL does not have adverse effects on the acquired mother tongue.

Edgin, Kumar, Spano, and Nadel (2011) also developed another study of bilingualism in people with Down syndrome. The participants of this study were thirteen individuals with DS, who were frequently exposed to another language more than their native (English), predominantly Spanish. In this study, the authors demonstrated that frequent exposure could be an important tool to help DS students to understand an SL. Moreover, they confirmed that DS students were able to learn a second language.

In conclusion, many researchers stated that people with DS could become bilingual, and there is no reason for them to be excluded from a bilingual learning environment.

Statement of the problem

According to Bird et al. (2005), it was believed that children with DS should not be exposed to two languages for some time. The authors mentioned that DS children usually present delays acquiring their first language (L1), so the limitation to a single language



appeared logical to avoid negative consequences in developing the mother tongue. However, recent studies demonstrated the opposite. For example, Sicilia (2017) reported that a second language does not have detrimental effects on the acquired mother tongue and that people with Down syndrome can learn a second language if teachers use effective strategies in class.

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2008) stated that inclusive education exists. It means that Down syndrome individuals can study in any public or private school and be part of regular classes. Nevertheless, as Cifuentes, Rojas, and Cárdenas (2017) mentioned, teachers need to know more about disabilities and use different strategies to teach these DS students.

A foreign language is “any language other than that spoken by the people of a specific place” (YourDictionary). According to Mizza (2014), a second language is “other language than a person’s native or mother tongue, being studied or learned” (p.101). In this research, second language and foreign language, both terms, were labeled as second language. This paper intends to investigate and analyze the different strategies that educators have used to teach a second language to students with Down syndrome. According to Gràcia (1999), learning a second language is a slow and challenging process at the beginning. Nevertheless, later with the help of teachers, classmates, and family, people with DS find learning an SL beneficial for their daily lives.

Rationale

Abbasian and Ebrahimi (2020) mentioned that teaching a second language to children with disabilities, such as Down syndrome, represents a challenge for teachers and learners. For a long time, the language of DS students was restricted to the mother tongue because it was believed that bilingualism had adverse effects on the receptive and productive first



language systems of these children (Katsarou & Andreou, 2019). This belief raised doubts among researchers, which is why several research studies have focused on the effective teaching of an SL among individuals with DS. Bird et al. (2005) demonstrated that bilingualism is possible for DS students, and they also highlighted that an SL does not have harmful effects on the acquired mother tongue. However, as Vallejos (2016) mentioned, there is a surprising lack of information about strategies to teach a second language to Down syndrome students.

Inclusive education is a rising trend in the world. Consequently, entities like the United Nations (UN) have promoted projects to highlight the importance of supporting rights by establishing cultural and social policies that encourage people with disabilities. In Ecuador, inclusive education is still a new term, and it is in the process of consolidation (Clavijo, López, Mora, Ortiz, & Cedillo, 2016). Ecuador works with the “Plan Nacional del Buen Vivir” (PNBV), which develops inclusion, social protection, integration, and territory. Based on this plan, the Ecuadorian educational system identifies and values all people, giving special attention to priority groups. Additionally, the PNBV includes basic actions such as inclusive education for students with disabilities, which all educational institutions must promote (SENPLADES, 2012).

This research is essential since, as future teachers of English as a foreign language (EFL) in Ecuador, it is necessary to know how to work with students with different impairments, specifically with Down syndrome. In addition, EFL teachers need to be aware of inclusive classrooms to support DS students and use their strengths to give them a meaningful learning experience by using appropriate strategies.



Research questions

What are the applied strategies to teach a second language to students with Down syndrome?

What are the effects of each type of strategy on Down syndrome students learning a second language?

What are the teachers' perceptions about teaching a second language to students with Down syndrome?

Objectives:

General:

To recognize what strategies are helpful to teach a second language to students with Down syndrome.

Specific:

To identify the strategies applied to teach a second language to students with Down syndrome.

To determine the effect of each type of strategy on students with DS when learning a second language.

To describe teachers' perceptions about teaching a second language to students with Down syndrome.



CHAPTER II

Theoretical Framework

This research synthesis is about different strategies that teachers can apply to help Down syndrome students to learn a second language. Therefore, definitions and relevant aspects about inclusive education, Down syndrome, and a description of a second language will be presented to provide the necessary background.

Inclusive Education

Many authors and organizations define inclusive education by using different words. For example, Stubbs (2008) mentioned that "Inclusive education is, very simply, a statement of everyone's fundamental right to access education and not be excluded." (p. 18). Also, she added that "Inclusive education refers to a wide range of strategies, activities, and processes that seek to make a reality of the universal right to quality, relevant and appropriate education." (p. 8). In addition, Polat (2011) highlighted that inclusive education considers individuals of any race, ethnicity, disability, gender, or other aspects of human identity that might be seen as different from the rest. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 1994) developed The Salamanca Statement, which declared that common schools with an inclusive adaptation are the most successful means of facing discriminatory attitudes, creating an inclusive society, and reaching "education for all" (p. 4). Moreover, it mentioned that these kinds of schools could supply fruitful education for most children and enhance the effectiveness of the whole education system.

It is not only essential to know what inclusive education is but also to know how it has developed through time. For that reason, the historical background is needed to describe its history and context.



Historical background

According to Downing and Peckham (2007), inclusive education has become a trending topic for the last 30 years because different declarations and mandates have been issued to favor special needs students. The Universal Declaration of Human Rights (1948), Article 26, established that “Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory.” (p. 7). Also, according to Ainscow & César (2006), the Education For All (EFA) movement gained strength in the 1990 thanks to different international policies that UNESCO guided. Moreover, UNESCO (2008) presented a document about educational inclusion, referring to students' needs. In the 21st century, Ecuador was a country that focused on offering education to the masses and did not take into account students with special needs. In 2010, the Manuel Espejo foundation was created to know how many people with different disabilities were in the country; and then determine their necessities to make laws for their benefit. (Bravo, Villafuerte, & Ormaza, 2013).

Inclusive education underlines that individuals with disabilities should have admission to quality education. The Salamanca Conference on Special Needs Education focuses on children with disabilities and other drawback groups and takes inclusiveness to secure education (UNESCO, 2015).

Disabilities

According to the Centers for Disease Control and Prevention (CDC, 2020), disability refers to a condition of the body or mind that makes it difficult to develop specific activities and interact with the world. Also, according to the World Health Organization (WHO, n.d.), disability refers to humans with a health condition like cerebral palsy or Down syndrome, and personal environment factors such as negative attitudes or limited social support.



Unfortunately, individuals that present any disability have to deal with fewer opportunities than regular individuals. "People with disability experience poorer health outcomes, have less access to education and work opportunities, and are more likely to live in poverty than those without a disability" (WHO, n.d., para. 3).

Intellectual Disability

Intellectual disability is an abnormality that refers to the level of cognitive functioning that an individual demonstrates. People with intellectual disabilities have significant problems when receiving, processing, or adapting information. This abnormality involves a tremendous social effect since it affects the children that suffer from it, their family, and society (Shree & Shukla, 2016). People with intellectual disabilities can do simple things like play, dance, or create things; however, they cannot grasp abstracts. Also, students with this condition learn in their way, slower than their peers that do not have this disability. Finally, they present difficulties when associating information in different situations. (Bernie-Smith, Patton, & Kim, 2006).

According to Dierssen (2012), "Down syndrome is the most common form of intellectual disability" (p. 844). Because of the impairments students with Down syndrome have, they face many problems in comparison to their regular classmates. "Hearing loss and oral-motor problems are common in DS and have important adverse effects on language learning and use." (Abbeduto, Warren, & Conners, 2007, p. 249). Also, Ramos (2007) claimed that Down syndrome is a condition, not a disease. However, because of the characteristics this condition presents, it requires scholarly attention from the very beginning, which should be considered when designing a linguistic program.



Down syndrome

In 1886, the first person who used the word disorder to describe Down syndrome was Doctor John Langdon Down. Even though he could not discover the principal causes of the condition, this disorder was named after him in the early 1970s. (National Association Down Syndrome, n.d.). Down syndrome is “the most common chromosomal disorder in newborns” (Levman et al., 2019, p. 1). According to Asim, Kumar, Muthuswamy, Jain, & Agarwal (2015), it is also the most leading cause of intellectual disability.

Epstein (1989) mentioned that individuals with DS confront a group of physical, mental, and functional malformations that result from trisomy 21, which is the existence of three chromosomes 21 instead of the typical two, which causes mental retardation. Furthermore, Epstein (1989) claimed that three remarkable nervous system abnormalities distinguish Down syndrome. The first is an exceptional level of hypotonia that causes a feeling of limpness. The second is intellectual disability, which may vary from moderate to severe. The third is the increasing loss of mental function, affecting around 50% of people with DS older than 50 years. Moreover, as Hayes and Batshaw (1993) mentioned, “the prevalence of Down syndrome is 1 in 700 births, and boys outnumber girls 1.3 to 1.0.” (p. 524). Down syndrome may affect different domains such as language learning, which is a remarkable area affected by this mental handicap (Bird et al., 2005).

Down syndrome language learning

Chapman, Seung, Schwartz, and Bird (1998) mentioned that Down syndrome typically comes accompanied by mental retardation, consequently delaying language development. As a result, children with DS tend to have more significant deficits in expressive language, particularly in the morphosyntactic domain. (Chapman, 2003; Bird & Chapman, 2011). On the other hand, receptive vocabulary has been presented as a potential



strength for people with this condition. (Chapman, 1995; Chapman, Bird, & Schwartz, 1990; Chapman, Schwartz, Bird, 1991; Chapman, Seung, Schwartz, Bird, 1998, 2000). However, as Chapman (1995) suggested, a more significant gap between production and comprehension vocabulary emerges almost with the onset of first words.

According to Chapman (1997), "such dissociation of language and other cognitive skills can occur in otherwise typically developing children, and it takes at least two forms: specific language impairment of expressive language (only), and specific language impairment of both receptive and expressive language." (p. 307).

Language is one of the most affected areas of functioning in Down syndrome students, and maybe, the most difficult one in terms of inclusion in society. (Abbeduto, Warren, & Conners, 2007). Also, AlDhahri (2016) mentioned that DS individuals "face difficulties finding the correct formulation of words and sentences." (p. 7)

Regarding acquiring a second language, DS students can learn and deliver information, speaking or writing, but the procedure is slower than regular (AlDhahri, 2016). Moreover, intervention to support DS students' communication tends to show positive effects (Montagut, 2008). The type and frequency of intervention in the early years of these individuals can significantly impact language development. (Yoder, Woynaroski, Fey, Warren, & Gardner, 2015).

Students with Down syndrome can learn another language different from their native one, and it does not have detrimental effects on its development (Burgoyne, Duff, Nielsen, Ulicheva, & Snowling, 2016). It has been demonstrated that children with Down syndrome can learn more than one language and that a second language does not affect the acquired mother tongue (Vallar & Papagno 1993; Woll & Grove, 1996; Bird et al., 2005). Bilingualism does not negatively impact language skills in people with DS; DS individuals



are able to learn more than just their native language. (Cleave, Bird, Trudeau, & Sutton, 2014).

Second Language

A second language is any other language that is learned beyond the first or native language. It is used for different purposes such as public communication, higher education, trade, work, etc. (Cambridge Advanced Learner's Dictionary & Thesaurus, Collins English Dictionary, Oxford Advanced Learner's Dictionary, Dictionary Merriam-Webster)

A second language involves two environments. The first is the language learned in the context by non-native speakers; On the other hand, it also refers to Foreign Language, in which the language is not spoken in the country of the speaker, but the person consciously wants to learn it. (Nayar, 1997).

Second language in students with Down syndrome

Some time ago, learning a second language was not an available option for students with DS. Learning their first language was already considered a difficult task, so an SL was considered almost impossible (Bird et al., 2005) because it was thought to have detrimental effects on students' L1 (Katsarou & Andreou, 2019). However, this belief is a myth now since many authors (Bird et al., 2005; Edgin, Kumar, Spanò, & Nadel, 2011; Katsarou & Andreou, 2019) have reported that SL in DS does not have negative effects. On the contrary, "...when the family is supportive and encourages the child to learn languages for their sake, this DS child's future would be much better in communicating with the world without facing difficulties of being a special child" (Aldhahri 2016, p. 5).



"A bilingual environment is often a necessity, not a choice." (De Houwer, 1999, p. 1). Learning a second language is a tool that helps students to interact in a world that becomes more global every day. Studies have demonstrated that people with DS can reach a second language and even a third one (Vallar & Papagno, 1993).

In addition, as Cifuentes, Rojas, and Cardenas (2017) claimed, teachers need to use different strategies to teach DS students. For that reason, it is crucial to describe the most relevant teaching strategies.

Teaching strategies

Anilkumar (2021) defined teaching strategies as “methods and techniques that a teacher will use to support their pupils or students through the learning process” (para. 6). Also, Beck (1998) stated that because in the educational process, teaching strategies are nonspecific, each author has his/her own criteria for recognizing or categorizing a set of teaching strategies. Consequently, this research synthesis classified the teaching strategies into these main categories: Intrinsic, Extrinsic, Technological, and Motivational.

Intrinsic

Intrinsic is defined as relating or belonging to the essential nature or constitution of a thing, inherent (Merriam-Webster dictionary, The American Heritage Dictionary). In order to achieve the objectives of this paper, this term refers to the strategies applied to teach an SL, which occur in the essential nature of a class. These strategies make students practice and produce the learned content, for example, memory and cognitive strategies. Also, these strategies help teachers to gather students' comprehension and evaluate their progress, for example, compensation and evaluative strategies.



Extrinsic

Extrinsic is defined as not forming part or belonging to an essential or inherent part of a thing, external (Merriam-Webster dictionary, The American Heritage Dictionary). In consequence, for the purposes of this paper, this term was taken as the strategies used to teach an SL that arise from external factors. These strategies make students feel delighted, pleased, supported, proud, and comfortable with the teaching-learning process, for example, optimistic feedback and appreciation of students' work.

Technological

Technological teaching strategies are known in many different ways, such as ICTs, teaching with technology, educational technology, etc. This refers to the study and ethical practice of facilitating learning, improving the communication of knowledge, and its developmental exchange by creating, using, and managing appropriate technological tools, processes, resources, and media (Lathan, n.d.; Januszewski & Molenda, 2013). For the aims of this paper, technological strategies were taken as any strategy that needed any technological device or tool, for example, Duolingo, a humanoid robot, music, visual aids, and audiovisuals.

Motivational

Motivational strategies are those that not only maintain and increase students' motivation but also deal with students' persistence, engagement, and choice (Lamb, 2019; Astuti, 2016), for example, cooperative learning, games, role plays, tales, and realia.



CHAPTER III

Literature Review

Different authors have carried out research studies demonstrating that a second language is achievable in students with Down syndrome. Also, Morales (2017) claimed that the lack of research in this area should not exclude DS students from the good outcomes at social, cognitive, and linguistic level.

In this section, a review of the existing literature is presented. The studies have been classified into the following categories: Teaching a second language to Down syndrome students, strategies used to teach a second language to students with Down syndrome, and teachers' perceptions about teaching an SL to students with DS.

Teaching a second language to Down syndrome students

Through many research studies, different authors have demonstrated that people with Down syndrome can learn a second language or even a third language. For example, Buckley (2002) stated, children with DS can reach bilingualism, and the data shows that they do so in the same way as their pairs of typical developing of the same mental age.

Burgoyne et al. (2016) conducted a study about bilingualism and biliteracy in Down syndrome. The case study presented a girl with DS, referred to as MB, who spoke Russian (L1) and English (L2) and has learned to read in the two different alphabets with different symbol systems. The participant presented between moderate to severe range on cognitive tests. MB's L1 abilities were compared with three other groups. Her L1 was compared with 11 monolingual Russian speakers. Her L2 was compared with 15 English-speaking Typical Developing Monolingual students (TD-M) and six monolingual English-speaking children



with DS. For this study, five standardized tests were applied to estimate MB's level of general cognitive abilities. Also, to assess MB's English vocabulary, two tests were used: The British Picture Vocabulary scale (to assess receptive language) and The Expressive Vocabulary. In addition, to compare MB's L1 and L2, personalized literacy tasks with parallel Russian-English were designed. The results showed that MB had her cognitive abilities below the Typical Developing monolingual- English (TDE). Also, the results did not show significant differences between monolingual children with DS and MB. Nevertheless, MB performed at a similar level in her two languages, making her a balanced bilingual. Moreover, MB presented an average score in reading accuracy and fluency, which was at the same level as her typically developing peers; however, her reading comprehension was low. Finally, MB showed more verbal abilities than the nonverbal ones, since despite knowing fewer Russian letter sounds than English ones; she achieved the same score on the test.

Also, Gràcia (1999) conducted a study about bilingualism in Down syndrome children in Barcelona, Spain. The study presented the case of two children who were in the learning process of an L2. The first case was about a seven-year-old boy. His mother tongue was Catalan, and he was learning Castellano in a private school where both languages were used; however, Castellano was the lingua franca in the school. This case was analyzed through observations on regular conversations between the boy and his mother. The second case was about a 5-year-old girl. Her mother tongue was Castellano, and she went to an ordinary private school where the lingua franca was Catalan. This case was analyzed through observation of the conversations among the girl and her mother. Also, an interview with her parents was developed. In both cases, the mothers positively reacted to the children talking in two languages by correcting and encouraging them to use both languages without mixing them. This study provided two results. First, Down syndrome children, who presented severe difficulties in the learning and development of the language in both expressive and



comprehensive areas, were able to learn two languages by having flexibility on the use of the two languages in the scholarly context and also by enhancing the use and growth of the mother tongue. Second, when the mother tongue has been developing slowly but without severe problems, learning two languages can be accomplished without essential complications.

In addition, AlDhahri (2016) developed a study about acquiring an L2 in children with Down syndrome, which was developed in Jeddah, Kingdom of Saudi Arabia. The subject of the study was Sara Ahmad Filmban, a girl of 15 years old who was diagnosed with DS. Sara spoke Arabic (L2) and English (L1). Her Arabic and her English were quite good. However, the girl preferred to communicate by using English since it was her first language. The study used an interview to analyze Sara's performance in both languages. The results showed that the participant's languages were good enough even though her vocal cavity and other typical conditions of DS caused a few complications in understanding. Sara's usage of grammar was excellent; however, she mispronounced some words. The use of academic vocabulary during the interview made it hard for the girl to answer the questions, so synonyms were used instead to make it easier. Considering that Sara faced an intellectual disability, her language was acceptable, and it could be compared to the language of a regular child of 10 years old. Therefore, she demonstrated a good potential to learn a second language. Finally, this study demonstrated that learning an L2 is possible in individuals with DS, and that the support of the family and the right therapy represent a great advantage when an individual with DS is learning a second language.

Katsarou and Andreou (2019) conducted a study about bilingualism in Down syndrome students. This research study was developed in Greece. The participants were eight bilingual children with DS and eight monolingual children with DS between 4 to 8 years old.



The participants with DS presented mild intellectual disability. All bilingual participants were born and grew in Greece, so Greek was their native language. Their second language was English and they were exposed to it from the very beginning. The two groups were tested using a standardized test (the Psychometric criterion of language Adequacy), which measured receptive and expressive language related to their L1. The receptive language was examined by picture vocabulary, receptive vocabulary, morphosyntactic comprehension, and phonemic distinction. The productive system was examined by oral vocabulary and articulation. The results showed that these children with DS were able to learn two languages, and the learning of an L2 did not affect their L1. Also, this study mentioned that bilingualism in children with DS represented neither an advantage nor a disadvantage in developing their first language.

Strategies used to teach a second language to students with Down syndrome

It is well known that there is no a unique way to teach a second language to Down syndrome students; therefore, it is essential to investigate this matter and determine the most appropriate strategies (Melero, 1999). In this section, the information was organized according to the participants' ages based on the four stages of Down syndrome presented by Bittles, Bower, Hussain, and Glasson (2007):

- The prenatal period.
- Childhood and early adulthood, from 0 to 18 years old.
- Adulthood, from 19 to 40 years old.
- Senescence, from 40 years to onwards.

In this paper, only the stages of 1) childhood and early adulthood, and 2) adulthood have been reported by researchers. Also, in order to analyze the effects of a variety of teaching strategies, this paper added another category: multiple ages, which included research studies



with DS participants of different ages, including the senescence stage. In addition, Down's syndrome Scotland (2005) claimed that it is crucial to indicate that, in fact, children with Down syndrome show progress in their development; however, the progress they reach is slower than regular children. For this reason, the four stages previously mentioned fit in this research purpose, besides the information reported in the selected research studies.

Childhood and Early Adulthood

Vallejos (2016) developed a study in which she explored different techniques, strategies, and instruments to teach English vocabulary to a Down syndrome student. This study took place in Pudahuel, Chile. The participant of this study was Karla, a five-year-old child who had severe language impairments because of DS. She was a student that wanted to communicate with others, but she did not know how to do so. The strategies used in this study were cooperative learning, drillings, games, and visual aids (flashcards and videos). Also, the mainly used method was Total Physical Response. The methodology used to collect data in this study included journals, video recordings, and interviews with the headteacher, the special educator, and the speech therapist. The results evidenced that the techniques were effective and helped Karla improve her L2. This paper highlighted five results according to the applied strategies. 1) TPR was a beneficial method in the learning process of Karla since it involved activities that made her move and interact with the class. 2) The use of concrete material, in which she used her senses, encouraged her to be curious and more interested in learning the L2. 3) As short attention span is one of the problems that DS students present, short instructions showed to help the participant to understand and focus her attention in one single activity. 4) Visuals were handy to help Karla to learn vocabulary by linking the images with words. 5) Repetition played an important role when adding new vocabulary to her lexicon. It exposed Karla to the language and allowed her to have many opportunities to find



out and confirm the meaning of words. Furthermore, all the strategies presented were catching and demonstrated to be appropriate for the participant since her reaction was positive and she always showed motivation to participate in class. Finally, the participant's L2 improved mainly in learning new vocabulary.

Gràcia (1999) analyzed the development of DS children in a bilingual context. This study was developed in Cataluña, where the official languages are Catalan and Spanish. The participants were two children with DS. The first child was a seven-year-old boy, his mother tongue was Catalan, and his L2 was Spanish. He used Catalan to communicate at home and Spanish at school. His linguistic level in Catalan was of a four-year-old child. The second child was a five-year-old girl who presented a linguistic level of a 24 month child with a low level of intelligibility. Her mother tongue was Spanish, which she used to communicate at home, and her L2 was Catalan, which was used at school. In order to collect data, this study developed interviews with the children's parents and observations of the L2 language development in the DS children through conversations between the kids and their mothers. This research was developed indoors with the family and did not pay too much attention to the school context. The strategies used in this paper were repetition, immediate feedback, and translations. The findings showed that the applied strategies effectively improved the participants' language development in their L2 and made their communication more intelligible.

Gomes (2012) worked on a research paper focused on teaching EFL to a DS student by using similar language-learning conditions to the ones used with regular children. This research was developed in Viseu, Portugal. The participant of this study was a girl with DS, Clara, who was a chronological age of 10 years, and 7 years of cognitive age. The first language of the participant was Portuguese, and her target language was English. This study



was developed during 20 individualized sessions of one hour per week. In order to collect data, the author used observations, researcher's diaries, and application forms for each session. The strategies used were repetition, memorization, visuals (flashcards), games (listen and do, produce words/phrases), music, audiovisuals, technological, and realia. The findings revealed that Clara learned 29 of 30 words achieving a pronunciation similar to the children of her same cognitive age. She also improved her oral expression and understanding significantly though she preferred to respond by using short answers. In addition, her short and long-term memory enhanced noticeably. In the end, the participant was able to relate words with pictures and natural objects (and vice versa). Finally, Clara showed the same delays in the oral expression on her L1 when learning English as a second language.

Zambrano and Villafuerte (2020) presented a study about the use of recreational games as means to strengthen equilibrium and oral expression in DS children's L1 and L2. This study was carried out in an elementary school in Manta, Ecuador. The participants of the study were two Ecuadorian children, one girl and one boy with DS. Both of them were 11 years old and were in 6th grade. The boy was good at reading in the two languages, Spanish and English; however, he had delays in motor functions. The girl liked dancing and sports. Also, she had problems related to writing skills in both languages. As a way to collect data, this research used interviews, a pre-test, and a post-test. The strategies used in this paper were games such as round trip, chase games, plays with a ball, traditional games, and sports games. The findings showed that recreational games worked perfectly in both languages to help DS students with their equilibrium and oral expression as long as the games are used in the teaching lessons and the therapies. Finally, it was proved that recreational games helped children with DS reduce stress and develop self-confidence when speaking and performing complex body movements.



Yanto (2020) developed a research study that described the teaching activities of EFL for students with Down syndrome. This paper took place at SMPLB N 5 West Jakarta, Indonesia. The participants of this study were three English teachers and four students with DS in different grades: seventh, eighth, and ninth grade. Also, this study used various collection techniques: observation sheet, interview sheet, camera and voice recording, and documentation (syllabus, lesson plans, teaching activities, photos, and videos). The researcher was a non-participant observer to collect data, and the students had to share their opinions spontaneously. The strategies used were simple/word sentences, slowing down the speech, drilling, and appreciation of students' work. In addition, this paper used the approaches of Present Practice and Produce (PPP) and Grammar Translation (GTM). The results showed that the participants demonstrated improvement in 1) understanding words and sentences and recognizing vocabulary by using images and realia (visual memory), 2) pronunciation (verbal memory) by applying drillings. It is worthy to emphasize that the mentioned strategies were effective. The author recommended that teachers should make some adjustments in the class to teach a foreign language to students with DS. He also noticed that the syllabus design, instructional material, teaching strategies, methods and approaches, and assessment must be developed by considering the different abilities and learning features that each Down syndrome student could have.

Cifuentes, Rojas, and Cárdenas (2017) conducted a case study to explain the methodological elements to teach L2 receptive vocabulary to students with Down syndrome. This paper was carried out in Bogota, Colombia. The participants of this study were four students from fourth grade in a private education institution: Colegio Gimnasio Colombo Andino. They were two boys and two girls from ten to thirteen years old who had a different level of DS. They had problems with the articulation of words, long-term memory, and motor skills. They also had short attention span and low auditory skills. However, they had



good visual memory, writing, and artistic skills. Two students presented particular conditions. One student had isolation, which is a condition in which the individual lives in his world and always tries to avoid contact with other people. The second participant presented a visual condition called squint, a condition in which one eye looks in a different direction to the other eye. The instruments used to gather information were audiovisual materials, interviews, observations, and a survey. The methodological elements used in this study were making inferences, games, point out, Spanglish, drillings, and mixed approaches and methods (total physical response, grammar-translation, and audiolingual). The results showed that making inferences is a good strategy when teaching English to DS students. In this strategy, teachers gave small clues of a specific vocabulary item to make students understand or infer its meaning. Hence, students with DS could understand the topic that the teacher was explaining since they remembered these clues. Also, games were another helpful strategy. Games called students' attention through the use of group work and role-plays. Point out is another strategy that worked for students with DS as they were able to relate specific elements with the new vocabulary presented in class. Furthermore, it was demonstrated that background knowledge is a beneficial strategy since teachers could work from it. In addition, Spanglish helped students with DS recognize and understand the meaning of new vocabulary quickly. Finally, questioning was an important strategy because teachers could use it to check not only if the recently taught vocabulary was clear, but also to see if students with DS could remember the vocabulary studied in previous classes. In that way, students improved their memory and the acquisition of vocabulary. Moreover, drillings helped students with DS reinforce their long-term memory through the repetition of words. It also enabled them to practice pronunciation and memorize English vocabulary. Finally, teachers of this study mixed all the strategies in their classes. They also used different strategies; for example, they combined drillings with point out strategies.



Birková (2019) presented a study focused on the rehearsal technique in teaching English as L2 to Down syndrome students to know if it is possible to increase their short-term memory skills. This research was developed in Brno, Czech Republic. The participant was a thirteen-year-old girl with DS who presented a mild intellectual disability. She was a 6th-grade student and attended a conventional school. The girl delivered a limited speech, so she usually used straightforward sentences. Also, she had a partial visual disability; consequently, she wore glasses. Also, her family was supportive since they were involved in her education and extracurricular activities. This research used a survey, interviews, observation, a questionnaire, and piloting one-to-one rehearsal training to obtain information. The results revealed that 1) adequate training could prevent DS students' cognitive abilities from becoming obstacles to learn more than one additional language. 2) Rehearsal training might be the answer to the problem of poor short-term memory, which could be enhanced with consistency and use of repetition. Finally, 3) memory strategies improved the language processing of the participant.

Núñez and Canelones (2021) developed a study focused on tales as an educational tool for teaching Italian as L2, primarily through digraphs (Italian phonemes), to students with Down syndrome. This research was developed in the Unidad Educativa “Giuseppe Garibaldi” located in Guayaquil, Ecuador. The participants were 4 Spanish speaker students of 8th grade who were between 14 to 15 years old. The students had 4 sessions of forty minutes. Moreover, the present paper used a scale of estimation to collect necessary data. The primary strategy applied was a famous tale, “Cappuccetto Rosso” (Little red riding hood), divided into four parts consisting of lectures and analysis. The results evidenced that the use of tales in the L2 classroom helped students with DS promote the development in their 1) cognitive and memory ability, 2) relation with the L2 learning. Also, tales helped the participants improve their pronunciation and phoneme articulation. Finally, tales



demonstrated to be one of the most appropriated and entertaining strategies to work with children with DS since students had fun while learning a new language.

Salcedo, Fernandez, and Duarte (2018) reported a research study centered on technology as a strategy to improve the writing skill in the DS children's L2. This study took place in the city of Duitama, Boyacá, Colombia. The participants were two 8th-grade DS students between 14 to 15 years old studying in a private school. The technological tool used was Duolingo, a top-rated and free app to learn languages. This study was carried out in individualized twelve sessions of 15 minutes with each participant. Also, this paper used observations, interviews, tests, video recordings, and questionnaires. The primary strategy used was the technological strategy accompanied by audiovisuals and questioning. This paper concluded that using ICTs in EFL classes was helpful since the two participants demonstrated successful development in their writing skills; however, their speaking skill improvement was not significant. Furthermore, even though the result of the two individuals was not the same, both of them were able to use phonemes, write with coherence, and identify a combination of letters. Finally, the use of ICTs to teach EFL increased the motivation and interest of DS students when learning a new language.

Adulthood

Vargas (2017) presented a research study regarding drilling activities as means of bilingualism in students with Down syndrome. This paper was developed in Bucaramanga, Colombia. This study was carried out with a 21-year-old man with DS. The strategy that this paper used was drilling. This study used different tools to collect and analyze data: questionnaires, interviews, observation, video/tape recording, and diaries. The results showed that, through drilling activities, the participant could learn basic vocabularies such as greetings, farewells, colors, numbers, and some vocabulary related to his likes (swimming).



In addition, the student was able to learn 26 words during ten lessons demonstrating improvement in his English level. Finally, this study showed that regardless of the physical and mental condition that the participant presented, he was able to understand and produce basic vocabulary.

Sicilia (2017) conducted a case study that analyzed the acquisition of English as a foreign language in students with Down syndrome. The author investigated the interests of the participants when learning English as a way to recognize pedagogical strategies to teach L2 vocabulary. This paper was conducted in PRODIS; a foundation addressed to people with intellectual disabilities in Madrid, Spain. The participants were four Spanish speaker students with Down syndrome, three females and one male. They were 22 years old, except for one participant who was 24 years old. Data were collected using questionnaires, worksheets, lesson plans, tests, rubrics, a class blog, and an observation checklist. The collecting process was developed during five weeks, in which each session had communicative and learner-centered activities. The sessions always finished with optimistic feedback that motivated students to keep learning. The strategies applied in this research were role plays, cooperative learning, memorization, drillings, reading strategies (authentic material), and visuals (flashcards). The results proved that 1) by using role plays, the participants felt motivated, learned different expressions, and also had the opportunity to understand the real meaning of words and their correct usages by paying attention to the different contexts, 2) vocabulary was increased and enhanced thanks to the use of realia, drillings, and visuals since the students seemed to be more concentrated during the tasks. These strategies helped the participants learn content and made it easier for them to solve assigned tasks. In addition, this paper demonstrated that the activities that motivated and engaged students the most were the ones that were adapted to their preferences and required interaction between classmates. Additionally, students with DS were more likely to learn the L2 if they were exposed to a



mixed methodology approach and their abilities had been taken into account. Finally, it was highlighted that using the mother tongue was handy to help students who were struggling with the meaning of some words.

Vallar and Papagno (1993) carried out a research study focused on the role of short-term phonological memory in preserved vocabulary acquisition in a Down syndrome individual. The participant of this study was a 23-year-old girl who was able to speak three languages: Italian, English, and French. In order to collect data, this study used interviews, Wechsler Adult Intelligence Scale (WAIS), and the Baseline test (brain function). The strategy mainly used was repetition. The results underlined that phonological-short term memory is required in DS individuals when learning vocabulary. Also, thanks to repetition, the participant was able to learn new vocabulary.

Naderifarjad, Yousofi, and Ebadi (2019) published a paper based on teaching EFL to DS students to gain literacy in their L2 and their L1. This study was developed in Karaj, Iran. The participant of this study was a girl of 26 years old who attended 150 sessions. The collection of data was done by using diaries, observations, and video recordings. In addition, the study was based on teaching the English alphabet focused on reading skills. The student learned three new letters during each session. This research used the multisensory method, which highlighted the use of sight, movement, and touch. The teaching strategies applied in this paper were audiovisual, reading strategies, realia, and repetition. The results showed that the participant had learned more than 90% of English words well, and also, her reading skills developed noticeably.

Alemi and Bahramipour (2019) developed a research study that presented a humanoid robot as a teacher assistant to teach EFL to students with Down syndrome. This study was developed in Tehran, Iran. The participants in this study were 10 Iranian foreign learners with



DS who belonged to The Down Syndrome Center of Iran. They were all adults, four women and six men with an average of 30 years. They constituted a homogeneous group in terms of ages, cognitive abilities, and foreign language knowledge. Also, the students in this paper were randomly divided into two groups. One group worked with the humanoid robot and the other group without it. Both groups received the same lesson and participated in 8 sessions of an hour in which they were supposed to learn 40 English words, five new words in each class. In order to collect data, this research study applied tests (pre-test, post-test, and delayed post-test), observations, and a humanoid robot. The primary strategy used was the technological strategy, specifically a humanoid robot, accompanied by visuals (flashcards), realia, gestures, games, music, repetition, immediate feedback, and vigorous activities. The applied tests revealed that both groups showed improvement in English vocabulary and increased their cognitive abilities. Nevertheless, a significant difference between the two groups was identified. The group which used the humanoid robot demonstrated a better improvement in the acquisition of vocabulary. Finally, students were very motivated to participate and interact in class with the help of the humanoid.

Multiple ages

Abbasian and Ebrahimi (2020) investigated assessment perceptions of DS learners and their teachers in an EFL context. Moreover, it explored helpful strategies to teach English as a foreign language in DS students. This study was conducted in Teheran, Iran. The participants were 5 teachers and 35 students (male and female) with Down syndrome learning English as a foreign language. The students with DS were from 15 to 50 years old. In order to collect data, this study used observation, interviews, a questionnaire, and a test to discover the DS students' requirements. The methods and strategies applied were multiple-choice, matching, short-answer questions, fill-in-the-blanks, oral assessment, open-ended questions,



cloze tests, making sentences, completion, true or false, conversation with partners, speaking, and listening. The findings showed that the strategies that participants preferred are: multiple choice, matching, true-false, short-answer questions, discussion with partners, fill-in-the-blanks (in sentences), and oral assessments. On the other hand, open-ended questions, cloze tests, fill-in-the-blanks (in text), making sentences, and completion were the most challenging and demanding ways of assessment. Furthermore, it was demonstrated that applying strategies based on the students' preferences and needs allowed them to show and enhance their ability to use the L2. Finally, the motivation in language learning could be increased in DS students by using the strategies mentioned earlier.

Londono and Aguilar (2012) developed a research study focused on teaching EFL to adult learners with cognitive disabilities, including Down syndrome. This paper was developed in Pereira, Colombia. The participants of this study were 12 students, three students with DS and 9 with other cognitive disabilities, and three teachers who were professionals in inclusive education. All students were diagnosed with moderate mental retardation and different levels of verbal disability and language problems. The chronological age of the participants was from 15 to 48 years old. The Down syndrome students had moderate and severe productive speech difficulties. In order to collect data, this study used observations, interviews, video recordings, field notes, researchers' journals, and learners' products. The strategies used in this research were visuals, code-switching, and collaborative learning. Also, this paper used activities in which students could paint, label, and match. The results showed positive effects in both languages, mainly in their articulation of words since progress was evident in English and their L1. Also, the participants learned the vocabulary and were able to use it in an appropriate context. In addition, the participants showed improvement in their comprehension of the L2, English. Finally, all the strategies were valuable and efficient in teaching EFL to the participants and also increased their motivation.



Teachers' perceptions

This section reports different studies about teachers' perceptions when teaching an L2 to DS students. Some of the studies below were described in the section of *Strategies used to teach a second language to students with Down syndrome*. However, the first three research studies remark on teachers' main problems in an inclusive classroom and provide an excellent insight into teachers' perceptions.

Training as the main teaching strategy

Kyffin (2018) addressed a study about teachers' perceptions when using different teaching strategies to support English (L2) communication of young children with DS. This study was developed in the city of Bangor, United Kingdom. The participants of the study were 38 practitioners in provision type and home language divided into two groups. The first group was composed of 8 teachers and 9 members of the primary school. Then, 7 teachers and 14 members of the primary school constituted the second group. In order to collect data, this study used interviews and documentary analysis. The two groups described a total of 102 strategies. The strategies used were divided into seven groups: the Early Years Foundation Stage (EYFS) environment, relationships, assessment, pre-verbal strategies, verbal strategies, visual strategies, strategies for using alternative, and augmentative communication. The results showed that the participants who had previous training on teaching DS students had better results when applying different strategies. In contrast, the practitioners who did not have training struggled when dealing with children with Down syndrome. Also, this study mentioned that the main problem that practitioners without training had was communication because they could not assure an inclusive class. Moreover, all participants recognized that constant training focused on teaching Down syndrome students was necessary. Finally, the



participants believed that besides training, curricular adaptation is needed to help Down syndrome students to learn an L2 by using their strengths.

Vargas and Arias (2017) developed a research study focused on the teaching competencies to teach an L2 to Down syndrome students. This investigation was developed from the point of view of the members of the educational setting. This study was developed in Bogota, Colombia. The participants were 6 members of the academic environment who were recruited by 3 established criteria: head teachers of prestigious institutions that work with DS children and their educational issues, teachers with great experience and knowledge of teaching competencies in the classroom, and experts on the educational inclusion and attention to diversity. The data was collected by using a semi-structured interview. During the interviews, four teaching competencies were found: individual, differential, collective, and didactic-sensory. Based on the teachers' answers, this research noticed the following perceptions. The participants mentioned that teachers needed to be convinced that disabled students can actually learn regarding individual competence. Otherwise, teachers will not collaborate in the learning process of the student. They remarked that in order to teach and L2 to DS students, it is vital to develop a teaching profile that recognizes diversity without prejudice. Also, they highlighted that early training of teachers and exposure to a real inclusive classroom is necessary to test out their vocation in the area. Second, concerning the differential competence, the teachers recognized that the curriculum must be designed by considering the interests, potentialities, and cognitive processes of children with DS. Also, they added that the curriculum has to be flexible and should include adapted teaching strategies to teach an L2 to DS learners. Regarding collective competence, the interviewees mentioned that teachers should encourage DS students to communicate with others. They underlined that teachers should establish constant conversations with the rest of the students to avoid discrimination problems. Additionally, they mentioned that these competencies



allow regular students to share the classroom with DS people, recognize them as subjects, and help them to improve their capacities. Moreover, the teachers mentioned that they should establish constant communication with the DS children's parents to check their virtues and potentiate their abilities. Finally, about the didactic-sensory competence, the participants supported the importance of creating didactic strategies through games based on the most important senses of children with DS: visual, tactile, and auditory. The results showed that an L2 teacher must develop the four teaching competencies to be able to support students with DS in an inclusive classroom.

Martins (2018) carried out a research study focused on the challenges of teaching Spanish (L2) to students with DS. This research was developed in Feira de Santana, Brazil. The participants of the study were the researcher as a teacher and 21 students divided into two groups. The first group had 11 boys and girls, including 3 children with DS from 7 to 12 years. The second group had 10 students, including 6 people with DS from 12 to 26 years. The research was developed during 4 weeks. The data was collected through class recording and reflective diaries. This research took the word "challenge" as problems that a teacher faces in an inclusive classroom and cataloged these difficulties into three dimensions: academic, didactic, and institutional. The results that this study evidenced were divided into the 3 dimensions. First, regarding the academic dimension, the teacher pointed out that university did not prepare her to teach an L2 to students with special educational needs. Also, another challenge that the teacher reported was related to the use of the L1. The students preferred to use their native language to communicate because they were afraid of committing mistakes in their L2. Second, regarding the didactic dimension, the researcher explained that the needed material for teaching DS students did not exist or was not available. Also, she mentioned that another problem was group and time management and the lack of interaction of the students with the L2 since DS students were frequently absent. Third,



referring to the institutional dimension, the investigator said that the classroom was not appropriate since it was too small. Finally, this paper showed the teacher's perceptions about teaching a second language to DS students. The teacher highlighted that training is a fundamental aspect of teaching a second language to this vulnerable group. She mentioned that the teacher should analyze the main teaching strategies of people with DS and use a variety of material in class. In addition, she stated that the curriculum needs to be adapted in order to help the student's inclusion in society. Finally, she underlined that a more appropriate space where the students can move would benefit their learning experience.

In the research study of Abbasian and Ebrahimi (2020), where the participants were 5 teachers, it was reported that giving enough time and being patient with DS students while doing a task or answering questions helped increase their motivation in the process of learning an L2. Also, the teachers mentioned the necessity of dividing the projects into more miniature stages to enhance the students' performance and develop efficiently one step at a time. Additionally, the participants remarked that teachers should give clear and direct instructions and pay attention to each student's learning process to guarantee their success. In the end, instructors highlighted the importance of teachers' training in the area of disabilities to understand better and effectively assist DS students by taking their needs into account.

Other teaching strategies

In the study developed by Vallejos (2016), she reported that using various strategies focused on the students' strengths was beneficial for the learners. Also, she added that many people had a wrong view about the primary level teachers since they were seen as caretakers instead of someone whose work was to ensure the students' learning process. Furthermore, the teacher alluded that all school members, specialists, and parents needed to be involved in the learning process. Besides, she highlighted the necessity of teachers' instruction to be



prepared to teach students with different disabilities. Finally, the author established that time, support, and strategies must be appropriate and adapted for DS students to have the opportunity to learn an L2 actively.

In the research developed by Yanto (2020), he asked different teachers to respond to an interview based on their perspectives of teaching an L2 to DS students. First, the teachers underlined that some adjustments in the English syllabus should be made by paying attention to the students' learning interests and conditions. Second, the teachers mentioned the importance of shortening the content of the syllabus to increase DS students' engagement and facilitate their learning process. Also, they believed that it would be better to teach some topics slowly, so students learn it well than teaching many topics, and students learn only a few parts of them. On the other hand, teachers talked about their experiences and their problems when teaching a second language to DS students. They reported that because of the DS students' limitations, it was hard to transmit knowledge, apply different strategies, give instructions, and make students differentiate the L1 from the L2.

In the study developed by Londono and Aguilar (2012), they interviewed three teachers to know about their perceptions of teaching an L2 to students with Down syndrome. The interview results showed that all teachers agreed that exposing students with cognitive impairments, including DS, to an L2 helped learners reinforce their skills in their L1. Also, this exposure assured the students to be more active and open to participate in class. Furthermore, the teachers reported that students did not forget the content taught even when they were a group that failed to remember things. They underlined that the reason was that students were constantly motivated during the learning process by the use of visual materials, games, and dynamic activities instead of the typical book. Moreover, the educators mentioned a change in the students' social development since they were open to receive their



English class, even when they rejected new people. Also, they mentioned that working collaboratively between two teachers in the class was a great advantage since they could support each other; and at the same time, they could pay special attention to each student. Furthermore, the instructors recognized that they felt motivated because the main goals of the class were achieved. However, sometimes teachers felt frustrated when they were not able to apply what was planned for class since they could not understand the students' attitudes and behaviors (such as crying or getting mad without reason), so they had to stop the class and handle the situation. Therefore, they looked for external help professionals to learn how to overcome unexpected problems, so they also remarked on the importance of having training on teaching DS individuals. Finally, the teachers highlighted that having a good relationship between teacher-students and taking into account their emotions and learning needs could affect students positively. Thus, students would learn almost everything, or at least put a lot of attention, enthusiasm, effort, interest, and love into the learning process.

The studies mentioned above provide a better comprehension of the different teaching strategies used to teach an SL to Down syndrome students. It also helps to see the learning process of this vulnerable group from the point of view of SL teachers. The aspects presented in this section are essential for the purpose of this paper, which deals with the acknowledgment of effective teaching strategies to teach a second language to students with Down syndrome.



CHAPTER IV

Methodology

In order to respond to the proposed research questions, an exploratory bibliographic research synthesis was employed. Also, twenty-two studies focusing on “Teaching a Second Language to Students with Down Syndrome” were analyzed. The articles examined were empirical studies that used any teaching strategy to teach a second language to students with DS or provide essential data for this paper.

Moreover, data were collected from the following databases: Google Scholar, Revistas Científicas Complutenses, Dialnet, Taylor & Francis, and ProQuest Educational Journals. For the research synthesis, a mixed-method (qualitative and quantitative studies) was considered, and there were no restrictions related to the design of these studies. Finally, the sources remained on virtual media due to the limited information about the topic.



CHAPTER V

Data Analysis

For this research synthesis, 22 studies were collected from various sources and cataloged according to their contribution to this research. The studies helped to confirm that DS students can learn an L2, recognize what strategies are effective to teach an L2 to Down syndrome students, and describe the teachers' perceptions regarding teaching an L2 to DS students. In addition, the year and the continent of the publication, the number of participants (DS students), and the strategies were taken into account for classifying them.

Publication Year of the Studies

Table 1

Publication Year of the Studies

Year of publication	Author(s)	No. of studies
1990 - 2005	Vallar & Papagno (1993); Gràcia (1999)	2
2006 – 2021	Gomes (2012); Londono & Aguilar (2012); AlDhahri (2016); Vallejos (2016); Burgoyne, Duff, Nielsen, Ulicheva, & Snowling (2016); Cifuentes, Rojas, & Cárdenas (2017); Vargas (2017); Vargas & Arias (2017); Sicilia (2017); Salcedo, Fernandez, & Duarte (2018); Martins (2018); Kyffin (2018); Katsarou & Andreou (2019); Naderifarjad, Yousofi, & Ebadi (2019); Birková (2019); Alemi & Bahramipour (2019); Zambrano & Villafuerte (2020); Yanto (2020); Abbasian & Ebrahimi (2020); Núñez & Canelones (2021)	20

Table 1 presents the number of studies according to their years of publication. They were divided into two periods of time, between 15 years each. Most of the studies have been

published since 2012 (Gomes 2012; Londono & Aguilar 2012; AlDhahri 2016; Vallejos 2016; Cifuentes, Rojas, & Cárdenas 2017; Vargas 2017; Vargas & Arias 2017; Sicilia 2017; Salcedo, Fernandez, & Duarte 2018; Martins 2018; Kyffin 2018; Katsarou & Andreou 2019; Naderifarjad, Yousofi, & Ebadi 2019; Birková 2019; Alemi & Bahramipour 2019; Zambrano & Villafuerte 2020; Yanto 2020; Abbasian & Ebrahimi 2020; Núñez & Canelones 2021), while two were published at an earlier period of time. These data suggest a greater interest in the topic during the last years, and it confirms the authors' perceptions who mentioned that Down syndrome and bilingualism was an understudied topic (Feltmate & Bird, 2008; Cleave, Bird, Trudeau & Sutton, 2014; Bird, Cleave, Trudeau, Thordardottir, Sutton, & Thorpe, 2005.)

Teaching a second language to Down syndrome students

Since this paper focuses on teaching a second language to DS students, it was considered important to highlight the research studies that confirm that DS students are able to learn an SL further than those mentioned in the sections before the literature review.

Table 2

<i>Teaching a second language to Down syndrome students</i>		
Year of publication	Author(s)	No. of studies
1990 - 2005	Vallar & Papagno (1993); Gràcia (1999)	2
2006 – 2021	Gomes (2012); Londono & Aguilar (2012); AlDhahri (2016); Vallejos (2016); Burgoyne, Duff, Nielsen, Ulicheva, & Snowling (2016); Cifuentes, Rojas, & Cárdenas (2017); Vargas(2017); Vargas & Arias (2017); Sicilia (2017); Salcedo, Fernandez, & Duarte (2018); Martins (2018); Kyffin (2018); Katsarou & Andreou (2019); Naderifarjad, Yousofi, & Ebadi (2019); Birková (2019); Alemi & Bahramipour (2019); Zambrano & Villafuerte (2020); Yanto (2020);	20



Table 2 presents the analyzed research studies that confirm the ability of Down syndrome students to learn a second language. The studies were divided according to their year of publication. It is important to mention that 19 studies proved that DS students are capable of learning an SL through the use of many different strategies. On the other hand, 3 studies (AlDhahri 2016; Burgoyne et al., 2016; Katsarou and Andreou 2019) demonstrated that DS students can learn an L2 through the application of standardized tests and interviews.

Location of the studies

Because this paper was focused on teaching a second language to DS students, it was considered significant to acknowledge the continent where the analyzed studies were carried out.

Table 3

Continent of the conducted studies

Continent	Author(s)	No. of studies
America (Latin america only)	Vallejos (2016); Cifuentes, Rojas, & Cárdenas (2017); Zambrano & Villafuerte (2020); Núñez & Canelones (2021); Salcedo, Fernandez, & Duarte (2018); Vargas (2017); Vargas and Arias (2017);	9
Asia	Martins (2018); Londono & Aguilar (2012); AlDhahri (2016); Yanto (2020); Naderifarjad, Yousofi, & Ebadi (2019); Alemi & Bahramipour (2019); Abbasian & Ebrahimi (2020)	5
Europe	Burgoyne, Duff, Nielsen, Ulicheva, & Snowling (2016); Gràcia (1999); Katsarou and Andreou (2019); Gomes (2012); Birková (2019); Sicilia (2017); Vallar & Papagno (1993); Kyffin (2018)	8

Table 3 presents the location where the analyzed studies were developed. Out of thirteen countries, four are in America, specifically Latin America, six in Europe, and three in Asia. Because of the deep research that this paper has made, it is relevant to underline a lack of studies developed on this issue around the world, highlighting that no studies have been developed in Oceania and North America.

Participants ages (students with DS)

Table 4

Participants Ages

Ages	Author (s)	No. of studies
0-18	Vallejos (2016); Gràcia (1999); Gomes (2012); Cifuentes, Rojas, & Cárdenas (2017); Zambrano & Villafuerte (2020); Yanto (2020), Birková (2019); Núñez & Canelones. (2021); Salcedo, Fernandez, & Duarte (2018); AlDhahri (2016); Katsarou & Andreou (2019).	11
19 – 40	Vargas (2017); Sicilia (2017); Vallar & Papagno (1993); Naderifarjad, Yousofi, & Ebadi (2019); Alemi & Bahramipour (2019).	5
Multiple ages	Abbasian & Ebrahimi (2020) Londono & Aguilar (2012).	2

Note: N=1 **this table only presents 18 of the 22 research studies since the other ones do not provide information about students' age.*

Table 4 shows the age of the students with DS who participated in the different chosen research studies about learning a second language. As the data show, most of the subjects in this studies had an earlier intervention when they were 0-18 years old (Vallejos 2016; Gràcia 1999; Gomes 2012; Cifuentes, Rojas, & Cárdenas 2017; Zambrano & Villafuerte 2020; Yanto 2020, Birková 2019; Núñez & Canelones 2021; Salcedo, Fernandez, & Duarte 2018; AlDhahri 2016; Katsarou & Andreou 2019), while five studies were



developed with students of 19-40 years old (Vargas 2017; Sicilia 2017; Vallar & Papagno 1993; Naderifarjad, Yousofi, & Ebadi 2019; Alemi & Bahramipour 2019); and finally, two studies worked with multiple ages in which the participants were 15-50 years old.

Strategies used to teach a second language to students with Down syndrome

This section aims to answer the first research question: What are the applied strategies to teach a second language to students with Down syndrome? The first table presents the strategies divided into main categories and their subcategories. The second table shows the research papers that applied the strategies centered on their subcategories.

Table 5

Strategies used to teach a second language to students with Down syndrome

Main Category	Subcategories
Intrinsic	Memory Cognitive Compensation Evaluative
Extrinsic	Appreciation of students' work Optimistic feedback
Technological	Duolingo Humanoid robot Music Visual aids Audiovisuals.
Motivational	Cooperative learning Games Role plays Tales Realia

Table 5 presents the categorization of the strategies used to teach an SL to DS students. In fact, the categories have been analyzed from the major number of strategies to



the less number of strategies. First, intrinsic strategies are constituted with 25 strategies subdivided in 1) memory strategies: images; 2) cognitive strategies: drillings, repetition, rehearsal, memorization, making inference, reading strategies, and translations; 3) compensation strategies: Spanglish, gestures, point out, slowing down the speech, code-switching, oral assessment, and immediate feedback; and 4) evaluative strategies: fill-in the blanks, open-ended questions, cloze tests, questioning, multiple-choice, matching, short-answer questions, completion, and true or false. Second, motivational strategies are composed of 7 teaching strategies. Third, technological strategies are composed of 5 strategies, and the last one, extrinsic strategies, comprises 2 strategies. In short, it can be stated that a total of 39 strategies were used in the analyzed research studies to teach an SL to the population of students with DS, being the intrinsic strategies the most applied and the major category with a great variety of strategies.

Table 6

Strategies (subcategories) used to teach a second language to students with Down syndrome

Subcategories	Author(s)	N° of studies
Memory	Vallejos (2016)*, Yanto (2020)*	2
Cognitive	Vallejos (2016)*, Yanto (2020)*, Cifuentes, Rojas, and Cárdenas (2017)*, Vargas (2017), Sicilia (2017)*, Gràcia (1999)*, Gomes (2012)*, Birková (2019), Vallar and Papagno (1993), Naderifarjad, Yousofi, and Ebadi (2019)*, Alemi and Bahramipour (2019)*	11
Compensation	Cifuentes, Rojas, and Cárdenas (2017)*, Alemi and Bahramipour (2019)*, Yanto (2020)*, Londono and Aguilar (2012)*, Abbasian and Ebrahimi (2020)*, Gràcia (1999)*	6
Evaluative	Abbasian and Ebrahimi (2020)*, Salcedo,	3



	Fernandez, and Duarte (2018)*, Londono and Aguilar (2012)*	
Appreciation of students' work	Yanto (2020)*	1
Optimistic feedback	Sicilia (2017)*	1
Duolingo	Salcedo, Fernandez, and Duarte (2018)*	1
Humanoid robot	Alemi and Bahramipour (2019)*	1
Music	Gomes (2012)*, Alemi and Bahramipour (2019)*	2
Visual aids	Alemi and Bahramipour (2019)*, Vallejos (2016)*, Gomes (2012)*, Sicilia (2017)*, Londono and Aguilar (2012)*, Kyffin (2018)	6
Audiovisuals	Gomes (2012)*, Cifuentes, Rojas, and Cárdenas (2017)*, Salcedo, Fernandez, and Duarte (2018)*, Naderifarjad, Yousofi, and Ebadi (2019)*	4
Cooperative learning	Vallejos (2016)*, Sicilia (2017)*	2
Games	Vallejos (2016)*, Gomes (2012)*, Zambrano and Villafuerte (2020), Cifuentes, Rojas, and Cárdenas (2017), Alemi and Bahramipour (2019)*, Vargas and Arias (2017), Londono and Aguilar (2012)*	7
Role plays	Cifuentes, Rojas, and Cárdenas (2017)*, Sicilia (2017)*	2
Tales	Núñez and Canelones (2021)	1
Realia	Gomes (2012)*, Yanto (2020)*, Sicilia (2017)*, Naderifarjad, Yousofi, and Ebadi (2019)*, Alemi and Bahramipour (2019)*	5

Note: N=2 *This table presents 22 research studies*

Note: N=3 * *Studies appear in several subcategories*

Table 6 presents the subcategories of the strategies used to teach an SL to DS students in relation with their research studies. The subcategories of strategies were analyzed in terms of the application according to their research studies. First, the most applied subcategory of strategies was the cognitive, with 11 research studies that applied them. Second, games were

applied in 7 research studies. Third, compensation and visual aids were both applied in 6 different research studies. Fourth, realia was used in 5 research studies. Fifth, 4 research studies used audiovisuals. Sixth, 3 research studies applied evaluative strategies. Seventh, role plays, cooperative learning, music, and memory strategies were applied in 2 different research studies. Eighth, 1 different research study used appreciation of students' work, optimistic feedback, Duolingo, a humanoid robot, and tales. Finally, it is important to mention that this table presents a total of 22 research studies that repeatedly appear in different subcategories.

Effects of each type of strategy according to the DS students' age.

This category aims to answer the second research question: What are the effects of each type of strategy on Down syndrome students learning a second language? For this, the following table presents 19 studies that have been carried out with Down syndrome students and are cataloged based on their age.

Table 7

Effects of each type of strategy according to the DS students' age

Ages	Strategies	Effects	Author(s)	N° of studies
0-18	Intrinsic	Made conversation more intelligible. Vocabulary, oral expression, and understanding improvement. Improvement in the participants' short and long term memory.	Gràcia (1999)*; Yanto (2020)*; Cifuentes, Rojas, and Cárdenas (2017)*; Salcedo, Fernandez, and Duarte (2018)*; Vallejos (2016)*; Gomes (2012)*; Birková (2019)	7
	Extrinsic	Improvement on vocabulary, oral expression, and understanding. Improvement in the	Yanto (2020)* Vallejos (2016)*; Gomes (2012)*; Yanto (2020)*;	1



	Technological	participants' short and long term memory. Improvement in visual memory. Improvement on vocabulary, oral expression, and understanding. Increased interest in learning the L2.	Salcedo, Fernandez, and Duarte (2018)*	4
	Motivational	Improvement in students' equilibrium and oral expression. Improvement in cognitive and memory ability. Call students' attention. Reduce students' stress, develop self-confidence, and perform some difficult body movements.	Vallejos (2016)*; Gomes (2012)*; Zambrano and Villafuerte (2020); Yanto (2020)*; Cifuentes, Rojas, and Cárdenas (2017)*; Núñez and Canelones (2021)	6
19-40	Intrinsic	Improvement and increase in vocabulary. Cognitive abilities increased. Development of reading skills	Alemi and Bahramipour (2019)*; Vargas (2017); Sicilia (2017)*; Vallar and Papagno (1993); Naderifarjad, Yousofi, and Ebadi (2019)*	5
	Extrinsic	Motivation to keep learning.	Sicilia (2017)*	
	Technological	Vocabulary was increased and enhanced. Development of reading skills. Cognitive abilities increased. Motivation to participate and interact.	Sicilia (2017)*; Naderifarjad, Yousofi, and Ebadi (2019)*; Alemi and Bahramipour (2019)*	1 3
	Motivational	Improvement in students' equilibrium and oral expression. Improvement in cognitive and memory ability. Call students' attention. Reduce students' stress, develop self-confidence, and perform some difficult body movements. Enhancement of the L2 use.	Sicilia (2017)*; Naderifarjad, Yousofi, and Ebadi (2019)*; Alemi and Bahramipour (2019)* Abbasian and Ebrahimi (2020); Londono and	3



Multiple Ages	Intrinsic Technological Motivational	Increment of motivation. Improvement in the articulation of words. Increment of vocabulary. Improvement in the comprehension of the L2. Increment of motivation.	Aguilar (2012)	2
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Note: N=4 *this table only presents 19 of the 22 research studies since the other ones are about teachers' perceptions.*

N=5 * *Studies appear in several subcategories*

Table 7 shows the different results that each type of strategy had on DS students by differentiating them according to their age 0 – 18 (childhood and early adulthood), 19 – 40 (adulthood), and multiple ages. Though the applied strategies were different, they achieved similar results. Additionally, several studies used different types of strategies, so they are presented in many subcategories. First, according to the category of childhood and early adulthood (0 – 18), this table shows the results of 6 studies about applying cognitive strategies, 6 studies about using motivational strategies, 4 studies about applying intrinsic strategies, 1 study applying extrinsic strategies, and 4 studies involving technological strategies. Second, regarding adulthood (19 – 40), this table shows the results of, 4 studies that used cognitive strategies, 3 studies that used motivational strategies, 1 study that used intrinsic strategies, 1 study that used extrinsic strategies, and 3 studies that used technological strategies. Third, referring to the category of multiple ages, this table demonstrates the results of 2 studies that applied motivational and intrinsic strategies. It is important to mention that only one of the two studies reported in the category of multiple ages applied technological strategies (Londono and Aguilar, 2012). The results of applying this type of strategy were the same as using motivational and intrinsic strategies. The results are presented as belonging to both studies.

In short, all of the results presented are positive regarding the development of the four main skills of the English language. In addition, most of the outcomes obtained in the



analyzed research studies show an increase in motivation and improvement in vocabulary learning.

Teachers' perceptions

Since bilingualism in Down syndrome is not a thoroughly studied topic, it is important to show the L2 teachers' perceptions when working in class with DS students. Thus, by presenting the following table, this section answers the third research question: What are the teachers' perceptions about teaching a second language to students with Down syndrome?

Table 8

Teachers' Perceptions

Teachers' Perceptions	Author(s)	Nº of studies
Perceptions on training	Kyffin (2018)*; Vargas & Arias (2017)*; Martins (2018)*; Abbasian & Ebrahimi (2020)*, Vallejos (2016)*	5
Perceptions on curricular adaptations	Kyffin (2018)*; Vargas & Arias (2017)*; Vallejos (2016)*; Yanto (2020); Martins (2018)*; Abbasian & Ebrahimi (2020)*	6
Perceptions on collaborative work	Londono & Aguilar (2012)*; Vallejos (2016)*; Vargas & Arias (2017)*	3
Perceptions on classroom environment	Martins (2018)*	1
Perceptions on motivation	Londono & Aguilar (2012)*	1

Note: N=6 * *Studies appear in several subcategories*

N=7 *This table only presents 16 of the 22 research studies since the other ones do not report teachers' perceptions.*

Table 8 presents the most noticeable teaching perceptions when teaching an L2 to Down syndrome students. Most of the studies highlighted the importance of L2 teachers'



training (Kyffin, 2018*; Vargas & Arias, 2017*; Martins, 2018*; Abbasian & Ebrahimi, 2020*, Vallejos, 2016*) and the necessity of curricular adaptation (Kyffin, 2018*; Vargas & Arias, 2017*; Vallejos, 2016*; Yanto, 2020; Martins, 2018*; Abbasian & Ebrahimi, 2020*). Also, other teachers declared that collaborative work between teachers, specialists, and parents is crucial in the learning process (Londono & Aguilar, 2012; Vallejos, 2016*; Vargas & Arias, 2017*). On the other hand, some teachers showed concern about students' learning environment, the classrooms (Martins, 2018*). And finally, a few groups of teachers were interested in the motivation in class (Londono & Aguilar, 2012*).



CHAPTER VI

Conclusions

After analyzing different research studies, this paper approached the following conclusions. First, even though the process of learning is slower than usual, students with Down syndrome can learn a second language by using different teaching strategies such as intrinsic, extrinsic, technological, and motivational. However, the strategies that were most applied were intrinsic and motivational. Also, the cognitive, which is part of the subcategory of the intrinsic strategy, turned out to be the most applied strategy; for example, drillings and repetition were most used. The results of the applied strategies were alike between all participants' age and demonstrated an increase in students' motivation and improvement of vocabulary.

Second, although Down syndrome is a significant issue, most studies engaged in this paper have been conducted in Latin America, demonstrating several gaps on the topic that need to be filled in North America and Oceania. Furthermore, most of the analyzed studies have been developed with participants from childhood and early adulthood stages, between 0 to 18 years old.

In addition, the perspectives of SL teachers showed the need to understand the importance of training, curricular adaptation, collaborative work between teachers and parents, classroom environment, and motivation. Also, teachers demonstrated that training and curricular adaptations were the most important factors to consider when working with DS students.



Recommendations

By working on this paper, it was noticed the lack of research on the topic of teaching an SL to Down syndrome students and the strategies applied to do it. At this point, more research studies focused on this issue are necessary. In addition, the lack of studies in North America and Oceania recommends filling a research gap to have a global point of view on this issue. Moreover, as this paper counts with only one research study developed in our country, it is important to consider conducting more research studies about the Ecuadorian DS students' reality and how they learn an SL in order to enhance their education.

Regarding the age of students, it is also recommended to develop more research studies that include a broader differentiation of ages or educational level, so it could be a more significant categorization for the analysis and understanding of the effects of teaching strategies.

Moreover, it is important to mention the necessity of more studies focused on the teachers' perceptions about teaching a second language to students with Down syndrome since they are an essential factor that might affect the students' learning process.

Finally, the lack of research on the students' perceptions led to the importance of developing more research studies focused on this topic. Therefore, teachers can identify the students' preferences on learning and use them to improve the teaching process.



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Appendix

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