

Recreational Games to Strengthen Equilibrium and Oral Expression of Children with Down Syndrome

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Abstract—This research shows the contribution of recreative games on the improvement of oral expression and equilibrium in children with Down syndrome. Two are the cases of study chosen in this research project executed for 10 months in an elementary school located in Manta city, Ecuador. The researchers' team designed ad hoc., an educational intervention that articulates games and phonics for exercising the oral expression in Spanish and English languages. Besides, the participants train their static and dynamic equilibrium using the gamification model proposed by Delgado, Pérez, Mero, Villafuerte, and Macias in 2019. Pretest and posttest are applied to determine the participants' oral expression and equilibrium progress. The results allow concluding that recreational games contribute to developing oral expression and equilibrium in children with Down syndrome. However, the early therapies, family involvement, children's personality, and their learning attitudes impact on the children's performances.

Index Terms—basic education, down syndrome, equilibrium, inclusion, oral expression

I. INTRODUCTION

Language and motor functions have a positive correlation for the individual's integral development (Ternera, 2010). However, it is possible to detect in children with Down syndrome a delay in their language development (Zampini, Salvi, and D'odorico, 2015), and equilibrium (Beltrán, 2016). Thus, children with DS have difficulties to pronounce sounds, words, and messages correctly; and to run and to keep their body balance as an effect of the muscle hypotonia (Wajuihian, 2019); situations that influence negatively on their social relationship and academic performance. Inclusive education is still in the process of consolidation globally, which requires the interaction of multidisciplinary professional teams to propose didactics and other operational procedures. Besides, it is urgent to understand inclusive education as the inclusion of all children (Qvortrup and Qvortrup, 2017).

The Constitution of Ecuador (2008), allowed relevant advances for developing the inclusion in education in this country. However, most of the teachers feel, they are not well trained for the work in inclusive education (Corral, Villafuerte, and Bravo, 2015). Previous studies ratify the need to improve the dimensions: educational practice, and inclusive culture to consolidate the inclusive education in Ecuador.

Static and dynamic equilibriums are related to psychomotor development to promote children's interaction with others during everyday lives (García and Martínez, 2016). Besides, gamification contributes to strengthening people's communicational competence (González, Solovieva, and Quintanar, 2014).

Language is the way how people can express ideas and feelings to others for improving social interaction and integration with other members of a community (Chamizo and Rivera, 2013). In addition, language is the most common communicative way used for executing the teaching and learning process at every educational level. Thus, language provides to learners the opportunity to access to knowledge (Daunhauer, Fidler, and Will, 2014).

The signature of international agreements about inclusive education (UNESCO, 2009), had increased the presence of students with physical, sensory, intellectual, or mental disabilities in regular primary and secondary schools during the last 10 years. However, the development of theories and procedures for the inclusive education is still a challenge of the Ecuadorian education system (Villafuerte, Pérez, Boyes, Mena, Pinoargote, Riera, Soledispa, and Delgado, 2018).

Thus, this article authors expect to contribute to the strengthening of equilibrium and oral expression of children with Down Syndrome throughout an educational intervention based on recreational games. Besides, this work aims to support teachers and parents in the education of children with Down Syndrome.

II. LITERATURE REVIEW

A. Conceptualization of Equilibrium and Language

The term equilibrium refers to the interaction between the motor, sensory, and perceptive system (Lázaro, 2000). The equilibrium allows a group of organic systems to act effectively and with the maximum of energy savings (Muñoz, 2009). The domain of the body for giving stability to the person without falling to the floor could be called equilibrium (Espigares, Hernández, Correa, and Rodríguez, 2009). A wide range of daily activities requires equilibrium (Camargos, and Maciel, 2016) because, it involves function at a complex level as a voluntary action, emotional self-regulation, and personality configuration (Lee, Fadel, and Bialik, 2018).

The term equilibrium is the act of interacting with the motor, sensory, and perceptive system (Lázaro, 2000).

Equilibrium is also understood as the proper maintenance of the different parts of the body into space. The equilibrium allows a group of organic systems to act effectively and with the maximum of energy savings (Muñoz, 2009). The correct domain of the body for giving stability to the person without falling to the floor could be called equilibrium (Espigares, Hernández, Correa, and Rodríguez, 2009).

A wide range of activities requires equilibrium (Camargos, and Maciel, 2016). It also influences on the development of the kids' symbolic function at the complex level, voluntary action, emotional self-regulation, and personality configuration (Lee, Fadel, and Bialik, 2018).

Some types of equilibrium are stable, unstable, neutral, dynamic, static, rebalancing, and equilibrium with objects. All those types of equilibrium are required to develop gross and fine motor skills (Bravo, Villafuerte, and Ormaza, 2013; Lee et al., 2018). A wide range of daily activities requires the domain of equilibrium (Camargos, and Maciel, 2016). It involves functions of a more complex level like voluntary action, emotional self-regulation, and personality (Lee, Fadel, and Bialik, 2018).

The term language refers to the way of human communication. It operates the social interaction and integration in a community (Chamizo and Rivera, 2013). The receptive and expressive language processes provide people the opportunity to express their feelings and opinions but, also to access to knowledge (Daunhauer, Fidler, and Will, 2014). The active exchange of information allows people to improve dialogic relationships for strengthening their learning process (Cuisn and Ferreira, 2015). It helps kids to establish interactions with others during childhood (García and Martínez, 2016).

B. Inclusive Education in Ecuador

Ecuador had signed in 1995, the international agreements for the attention of the diverse population (Corral, Bravo, and Villafuerte, 2015). From the social and educational approach, the Inclusive Education (IE) allows responding to the diversity of all students' needs throughout greater participation in the learning process, cultural, and communitarian activities (UNESCO, 2009).

Inclusive education is understood as an efficient response to reduce the exclusion behavior in the conventional educational system. It means the introduction of changes in educational organizations to satisfy all the students' necessities (Raffo, Dyson, Gunter, Hall, Jones, and Kalambouka, 2009). However, the Latin American countries' first advance was the presence of children with educational special needs in regular schools (Echeita and Ainscow, 2011).

The integration of kids with disabilities in regular schools is not the real goal of inclusive education. It is a compensatory action for improving the inequities in access to the educational services of quality (Booth and Ainscow, 2000; Corral, Villafuerte, and Bravo, 2015).

Inclusive education is a set of actions, organizational policies, technical supports, and projects that any educational center has to work the students' educational special needs. Thus, the curriculum adaptations are required to establish alternative work rhythms coherent to the learners' possibilities (Muñoz and Martín, 2008; Villafuerte, Luzardo, Bravo, and Romero, 2017). However, in Ecuador is still necessary to work hard from social and educational fields to detect and diagnose in learners' disability conditions to apply the appropriate treatment (Segers, Bravo, Moreira, García, Villafuerte, Sancan, and Barcia, 2018).

C. The Down Syndrome in Childhood

John Langdon Haydon Down discovered this genetic alteration in 1866 but, 92 years later Jérôme Lejeune learned that Down syndrome is a chromosomal alteration that occurs when an individual has a full or partial extra copy of chromosome 21 (Beltrán, 2016; and Down Española, 2018).

Down syndrome is associated with diverse medical disorders related to physical and intellectual disabilities. They can be heart defects, vision problems, hypothyroidism, hypotonia, mental health, emotional problems, memory, etc. (Wajuihian, 2019).

There are three kinds of chromosome alterations: (a) Trisomy 21; (b) Mosaicism; and (c) Translocation (American National Down Syndrome Society, 2019).

(a) Trisomy 21: This is the most frequent kind of DS. It occurs for the Nondisjunction. Thus, the embryo has three copies of chromosomes instead of two.

(b) Mosaicism: Egg and sperm have a normal number of chromosomes. Nevertheless, during the cell division, the chromosomes are unusual. It is as a result of the presence of an extra chromosome 21. It means 47 chromosomes instead of 46.

(c) Translocation: It occurs when a chromosome 21 full or partial, is attached to another chromosome.

One in 550 toddler borns with DS in Ecuador. It seems that the age of the mother is the main cause of the syndrome.

To more age the more probability to have a baby with DS. However, Mazzi (2015) argues that genetic damage is appearing in young women with more frequency in the age range between 20 to 25 years. Besides, Mazzi introduced in 2015 the following table to show the relationship between a mother's ages and the potential frequency of Down Syndrome.

TABLE 1
MOTHER'S AGES AND POTENTIAL FREQUENCY OF DOWN SYNDROME

Maternal age	Chromosome anomalies	Possible presence
20	1/526	1/1667
25	1/476	1/250
30	1/385	1/952
35	1/202	1/385
40	1/65	1/106
45	1/20	1/30
50	1/7	1/11

Children with DS grow up in a similar way as children without DS. Nevertheless, they present difficulties to control their position because of the hypotonic effect. Thus, they can not control their equilibrium easily (Perpín, 2018).

Some factors that difficult their equilibrium are related to the impaired muscle tone, flexibility, impaired motor control, vision difficulties, vestibular issues, decreased endurance, etc. (Children's Hospital of Philadelphia, 2018).

They present a delay in their motor development, communicational, social and sensorial functions, and learning and cognition (Beltrán, 2016). Other features can include microgenia, macroglossia, small chin, dry skin, muscle hypotonia, etc. A diagnostic on time is an important factor for doing a correct intervention, giving support, etc. A late diagnostic of DS could be a relevant factor that affects children's health, cognitive, and motor development (Luque, 2019; and Wajuhian, 2019).

To García and Martínez (2016), the children with DS present some of the following characteristics:

- (1) Balance: The movement in children with DS can be slow, clumsy, and inharmonic between motor and cognitive.
- (2) Cognitive: The memory short and long – term can report difficulties in person with DS. Experts think that is essential the memory in the process of language (Fernández and García, 2013). It seems that the practice constant helps the memory who is stabilizing after 11 – 12 years old.
- (3) Difficulties in speaking: The hypotonia also prejudice the speaking competition. In consequence, some words are not clear pronounced. It is indispensably the language to express more quickly the thinking. However, it is important to know the meaning of the word (Chamizo and Rivera, 2013).
- (4) Macroglossia or enlarged tongue protruding beyond the alveolar ridge in resting position effects on the speaking (Nuñez, García, Morán, and Jasso, 2016). It has been classified in two categories: (a) true macroglossia, which occurs in congenital or acquired forms, and (b) relative macroglossia. Those physical conditions difficult the articulation for pronouncing the phonics: t, d, s, l, and n. In addition, the hearing loss is common in kids with DS, affecting their speaking (Kumin, 2017).
- (5) Motor and language: There are positive correlations between language and motor (Ternera, 2010). Thus, the motility and speaking function of children with DS are directly related to their learning process (Miranda, 2016).

D. Recreational Games and Psychomotor Skills

The recreational games are activities that contribute positively to the kid's integral development. Games articulate various dimensions of development such as expression, motor skills, affectivity, intelligence, sociability, etc. (Jiménez, 2006).

Games classification includes the following categories: (a) Round-trip and chase games; (b) Games with a ball; (c) Traditional games; and (d) Sports games (Vázquez, 2012).

To Sánchez (2011), the frequent use of the gamification allows execute the following didactic strategies: (1) Stimulation of participants expression and communication through the movement; (2) Participant's social recognition as a member of a community; (3) Self-assessment as part of a community; (4) Autonomy capability for the decision making; and (5) Solidarity and empathy as member of a group. At this point, games also support the development of players' abilities for plurality and diversity (Motta, 2013).

According to Mateo (2014), the designing of any educational interventions that include recreational games should consider: (1) Voluntary activity: children play voluntarily; (2) Enjoy your practice: children enjoy games; (3) Material disinterest: Players do not expect any material retribution when they play. (4) Use of time: It is considered as a valid, useful and positive way to use free time; (5) Inclusive and accessible: It is an activity to which all persons have the right to access free of social discrimination, age, disability, etc.; (6) Bakery: games are spontaneous or organized, and

individual or collective. Therefore, any educational intervention that involves gamification requires previous analysis in concern to the players' individual and group conditions such as body size and weight, bone structure and flexibility, etc., but also, players' necessities and interests to warranty their participation and enjoyment (Ben fez, 2011). Besides, student's course level and curriculum are key factors to consider when teachers design any educational intervention (Gutiérrez and López, 2015).

Finally, games contribute to the children's' physical, psychological and social health as a part of their integral development (More and Castellá 2016). Thus, the psychomotor function allows the progressive discovery of the body sensations (Segers et al., 2018). Children complete the muscle groups that control their posture, balances, and displacements between the ages of 5 to 8 years, however, children with DS present delays.

Psychomotricity includes the relationship between the person and the surrounding environment (Rodríguez and Arufe, 2016; Gromowski and Silva, 2014).

Linguistic expression skills allow people to communicate through the actions of listening, speaking, reading and writing, Besides, participants' physical and psychosocial, motor and spiritual condition (Delgado, Pérez, Mera, Villafuerte, and Mac ías, 2019).

However, games pretend to do the learning process as a pleasant experience (Pinzón, 2019) which generates pleasure and enjoyment in the participants by sharing movement and active environments (Posada, 2014). This ratifies that games generate satisfaction for those who take part in it (Delgado, Pérez, Mera, Villafuerte, and Bone, 2019).

III. METHODOLOGY AND INSTRUMENTS

This work applies the research methodology case of study. It analyzes cases of children with Down syndrome (SD) to determine the evolution before and after the administration of an educational strategy which includes recreative games to develop in the participants, their oral expression in Spanish (mother language) and English (foreign language); and their equilibrium. The questions to answer in this research are:

- (a) How can recreational games strengthen oral expression in children with Down syndrome?
- (b) How can the recreative games strengthen the equilibrium in children with Down syndrome?
- (c) What is the contribution of the recreative games to the oral expression evolution in children with Down syndrome?
- (d) What is the contribution of the recreative games to the equilibrium evolution in children with Down syndrome?

Participants:

The participants are a girl and a boy. They both attend to the 6th grade in a primary school in Manta, Ecuador. They are 11-year-old and have been diagnosed with Down syndrome. For the protection of their identity, they are called "the dancer" and "the philosopher" in this work.

The philosopher: He is an 11-year-old boy. He shows good attitudes for reading in Spanish and English languages. He shows a temperament trend intellectual but, presents a delay in motor functions. He reacts positively before the proposal of language challenges. His historic file reports an early stimulation and permanent language support from their parents and professionals.

The dancer: She is an 11-year-old girl. She shows good attitudes for dancing and sports but, presents a delay in reading and writing in Spanish and English. She shows a temperament trend of domination but, reacts positively before the proposal of physical challenges. Her historic file does not report early stimulation and language support.

Points to consider before beginning the work with these kids:

- Explain very well to the children the instructions in every session
- Parents asked the participants to work the session separately
- The boy has phobias to the dirty socks
- Avoid training the girl during the menstruation period because she reports physical pain.

Stages and instruments

The stages applied in this research are:

Stage: Pretest and Posttest diagnostics:

In the eco-environment of the school and in the presence of participants' tutor, the following instruments are administrated. The results are registered for the research team.

For oral expression: A diagnostic instrument was designed for the research team ad hoc. It consists of the interview to participants to assess:

Variables: (a) pronunciation; (b) intonation; (c) fluidity; in Spanish and English.

For equilibrium: It is applied to the Test Flamenco (García, 2001). The objective is to assess the children dynamic balance

Materials used are Rod of 3.60 m., Length x 10 cm. Width; and 15 cm altitude, stopwatch.

Description: The participant is requested to make 3 trips on the balance bar according to the following instructions:

(1) Frontally; (2) Right side, and (3) Left laterally. The tours must be carried out in a continuous way and without rest or pause between them.

Stage: The educational intervention:

For working the children's' oral expression: The educational intervention introduces games to train children's muscles

of the mouth, lips, and tongue. Includes the use of Phonics in 3 levels of complexion (basic, intermediate, and advance). Each level contains 10 sessions. This instrument is designed for the research team and evaluated for 3 local professional experts in language therapy. The observations of the experts were considered in the final version. It is applied for 5 months in 3 sessions per week in the facilities of the regular school where children attend.

For working children's equilibrium: The Games Methodology by Delgado, Pérez, Mera, Villafuerte, and Macias (2019) consists of series of exercises the children dynamic equilibrium using games and materials able in schools as balls, cord, plastic cubic, etc.

Ethic norms:

This research applies the following ethic principles:

1. The participant's relatives or tutor had signed a concern phonic and declared they participated voluntarily in this research.
2. The participant full is kept in anonymous to protect his identity.
3. The data collected in this work will be managed by the authors for 7 years.
4. *This research information can be used only for academic purposes. It will not be commerce for any reason.*

IV. RESULTS AND IMPLICATIONS

- (a) How can the recreational games strengthen the oral expression in children with Down syndrome? Participant's oral expression evolution can be observed on the following report. See tables 1 and 2.

TABLE 1
PRETEST RESULTS OF ORAL EXPRESSION IN SPANISH AND ENGLISH

The philosopher	The dancer
<p><i>a. Pronunciation:</i> He reports distortion when repeat words beginning with the phonics [T], [L], [D], [N], [S], [SH], and [CH]. The force he applies on n the phonic [D] made it sound as [T]. The force applied in the phonic N changes the sound as [M]. He did not pronounce the phonic [R]</p>	<p><i>a. Pronunciation:</i> She speaks a little (she only answers certain question). She does not pronounce the phonic [R]. She repeats with distortion the phonics [T], [D], [S], [CH] and [SH] weaker. She changes the pronunciation of some words Instead of CASH – CAD [D], SHOP – [O], THURSDAY – SEVEN [TH]. The energy used to pronounce some phonics distortion their sounds [M], [T].</p>
<p><i>b. Intonation:</i> He repeats sentences of level beginner using an appropriated intonation. He introduces questions using an appropriate tone. He narrates activities using a slight intonation. A little timid.</p>	<p><i>b. Intonation:</i> She repeats sentences of level beginner using an appropriated intonation. She introduces questions using a strong tone as giving orders to people. She narrates activities using a strong tone. She enjoys competitions and intends to lead the conversation using a strong tone.</p>
<p><i>c. Fluency:</i> He repeats sentences slowly. His speaking speed is estimated in 60 words per minute.</p>	<p><i>c. Fluency:</i> She repeats sentences slowly. Her speaking speed is estimated in 50 words per minute.</p>

Source: pretest diagnostic (2019).

Remarks about oral expression pretest:

The results confirm a delay in the development of participants' oral expression.

In the case of the philosopher:

The force impregnated in the phonics [D], [M], [SH], [CH], [R], [T] distorts and hinders the understanding of the words.

Recommendation: It is recommended to work intonation working his self-confidence. It is recommended to work exercises at the muscles of the mouth, lips, and tongue for improving his pronunciation.

In the case of the dancer:

She starts rejecting the oral expression test, but after a motivational dialogue, she assumes the practice. She reports distortion in the pronunciation of the phonics [R] [T], [D], [S], [CH], [SH], [M]

Recommendation: It is recommended to work exercises at the muscles of the mouth, lips, and tongue for improving her pronunciation.

TABLE 2
POSTTEST RESULTS OF ORAL EXPRESSION IN SPANISH AND ENGLISH

The philosopher	The dancer
<p><i>a. Pronunciation:</i> He improved his pronunciation. He pronounces correctly words ending with the phonics: [R] mother, chair, north [P] ship He pronounces correctly words beginning with the phonics [CH] watch He reports distortion when pronounce words having in the middle the phonic [L] Helicopter.</p> <p><i>Advances to a higher level of complexity</i> He reports distortion in the pronunciation of phonics of higher complexity. [ST] standard. He reports distortion in the pronunciation of words beginning with phonics [SH] shop, sheep [SW] swim, swindle, switch [K] think. Exception in the words Show. He reports distortion in pronunciation of words ending with phonics [SH] wash, cash. [K] Stock. He reports distortion in the pronunciation of words having in the middle the phonic [S] Measure. [BL] Establish. [EE] Chees.</p> <p><i>b. Intonation:</i> His intonation has been positively improved by repeating sentences or engaging in dialogues. He narrates activities he does at home, vacations, free time, etc., using correct intonation from beginning to the end of his speech.</p> <p><i>c. Fluency:</i> It is reported outstanding progress He begins conversations spontaneously with the research project members. He reports improvement to 75 words per minute.</p>	<p><i>a. Pronunciation:</i> She improved her pronunciation but, she still reports distortion when pronounce words ending with the phonics [R] Mother, Chair [P] Watch She reports distortion when repeats words that begin with the following phonics [CH] Watch [SW] Sweat [SH] Sheep. She reports distortion when pronounce words having in the middle the phonic [L] Elephant.</p> <p><i>Advances to a higher level of complexity</i> He reports distortion in the pronunciation of phonics of higher complexity. [ST] standard. She reports distortion in pronunciation of words ending with phonic [SH] wash, cash [CK] stock [N] thin.</p> <p><i>b. Intonation:</i> Her intonation has been positively improved by repeating sentences or engaging in dialogues. She describes personal activities using an appropriate intonation; but it is still the trend to speak in a soft volume at the end of his speech.</p> <p><i>c. Fluency</i> It is reported limited progress. She keeps the rhythm in pronunciation during dialogues. She reports improvement to 60 words per minute.</p>

Source: posttest of oral expression (2019)

Remarks about oral expression posttest:

In the case of the philosopher:

The posttest results show a relevant progress in oral expression. He pronounces correctly the phonic [D], [M], [CH], [T], [R].

He had reached the advanced level of complex ion in which it is possible to note distortion in phonic [ST], [SH], [SW], [K], [S], [BL] and [EE].

Intonation. He reports a good progress using appropriate tones during all her speeches.

Fluency: He presents a progressed to 75 words per minute (wpm)

In the case of the dancer:

The posttest results show a good progress in oral expression. She pronounces correctly the phonic [D], [M], [CH], [T]. She still cannot pronounce the phonic [R]. She still shows a trend for domain the dialogues.

She reports a limited progress in the advanced level of complex ion in which it is possible to note distortion in phonic [ST], [SH], [SW], [K], [S], [BL] and [EE].

Intonation. She presents a very good progress using appropriate tones during all her speeches. Even, she denies finishing the evaluation.

Fluency: She reports a progressed to 60 words per minute (wpm)

(b) How can the recreative games strengthen the equilibrium in children with Down syndrome?

Participant's equilibrium evolution can be observed on the following report. See table 3.

TABLE 3
MOTOR EQUILIBRIUM EVOLUTION DURING 3-MONTHS INTERVENTION

Diagnostics	The Philosopher	The Dancer
Pretest	Achievement: He completed 3 laps with support / 1 minute.	Achievement: She completed 2.5 laps with support / 1 minute.
Posttest	Achievement: He completed 3 ½ laps without support / 1 minute.	Achievement: She completed 4 laps without support / 1 minute.
The local standard for children without Down syndrome: 4 laps without support / 1 minute.		
The international standard for children without Down syndrome: 5 laps without support / 1 minute.		
Source: pretest and posttest of equilibrium (2019).		

Remarks for motor equilibrium diagnostic results:

The results confirm a delay in the development of participants' equilibrium.

In the case of the philosopher:

The participant begins the equilibrium test, showing high confidence. However, when he realizes his mistakes in the dynamic equilibrium bar, his confidence reduces. A person requires self-confidence to maintain static and dynamic equilibrium. For that reason, this research works the students' confidence, expecting to improve their equilibrium performances.

In the case of the dancer:

She began the execution of the test of equilibrium slowly, but when she familiarized herself with the activities, she assumed every game as a real challenge. It is a fact that equilibrium requires the participants' self-confidence for that reason, the project works such conditions in the participants expecting to improve their equilibrium performances.

(c) What is the contribution of the recreational games to the oral expression evolution in children with Down syndrome?

Remarks about oral expression evolution in the case of the philosopher:

His intonation has progressed. He uses appropriate intonation during his speech from the beginning to the end of the practice sessions. He does not show at himself as a timid boy even, he introduces questions using the appropriate tone during the dialogues spontaneously. His fluency had progressed from 60 words per minute (wpm) in the pretest to 75 wpm., at the posttest.

Finally, he loves to chat and enjoys singing. For that reason, it is recommended he practices singing in his spare time. See figure 1.

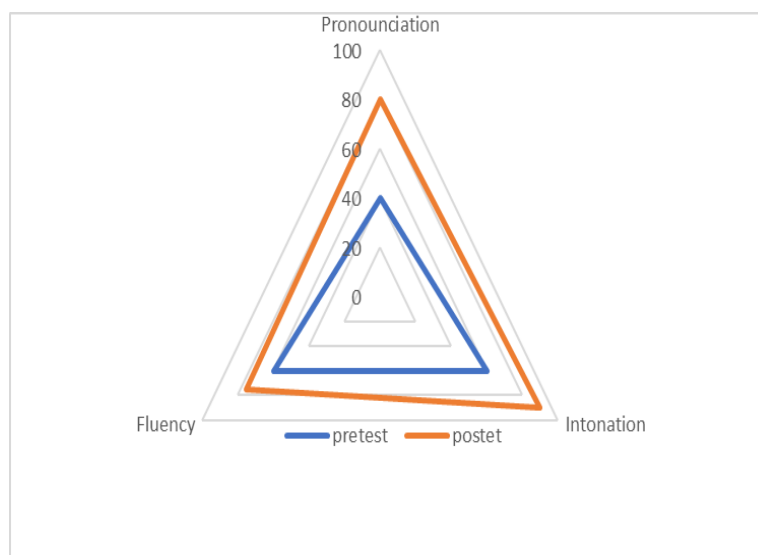


Figure 1 Oral expression evolution in the philosopher

Remarks about oral expression evolution in the case of the dancer:

The posttest results confirm that the participants reached better achieves in oral expression after the educational intervention that included games. The dancer still presents distortions in phonics especially when she repeats hard words to pronounce in both Spanish and English language. Her fluency has progressed from 50 words per minute (wpm) reported at the pretest to 60 wpm reached in the posttest.

She is an excellent conversationalist girl, but she is not able to express herself orally due to the limited word range she has. However, when the idiomatic practice becomes more complex, she collapses and breaks into tears. She enjoys dancing and singing for that reason it is recommended she develops those activities in her spare time. See figure 2.

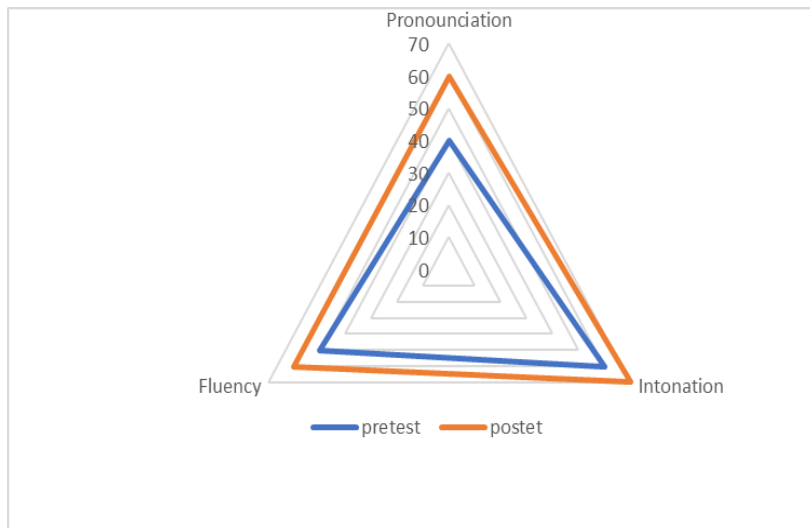


Figure 2 Oral expression evolution in the dancer

(d) What is the contribution of the recreational games to the equilibrium evolution in children with Down syndrome?

Remarks about equilibrium evolution in the case of the philosopher:

He shows very good progress from pretest result 3 laps to 3.5 laps in the postet. He shows from the beginning of the process insecurity and fear to fail the equilibrium practices. It has been necessary to support the philosopher's confidence in himself to complete the games that involve jumping.

Remarks about equilibrium evolution in the case of the dancer:

She shows outstanding progress from pretest result 2.5 laps to 4 laps in the postet. She shows from the beginning of the process a sport attitudes and competitive spirit. She loves to dance, and for that reason, she loved the games used for the researcher team to develop equilibrium. She has reached the standard reported for kids without Down syndrome.

He shows a very good progress from pretest result 3 laps to 3.5 laps. It has been necessary to support the participant working on his motivation and self-confidence.

Remarks about equilibrium evolution in the case of the dancer:

She shows an outstanding progress from pretest result 2.5 laps to 4 laps. She shows from the beginning sport attitudes and competitive spirit. She loves dance for that reason, she loved the games used for the researcher team to develop equilibrium. She has reached the standard reported for kids without Down syndrome.

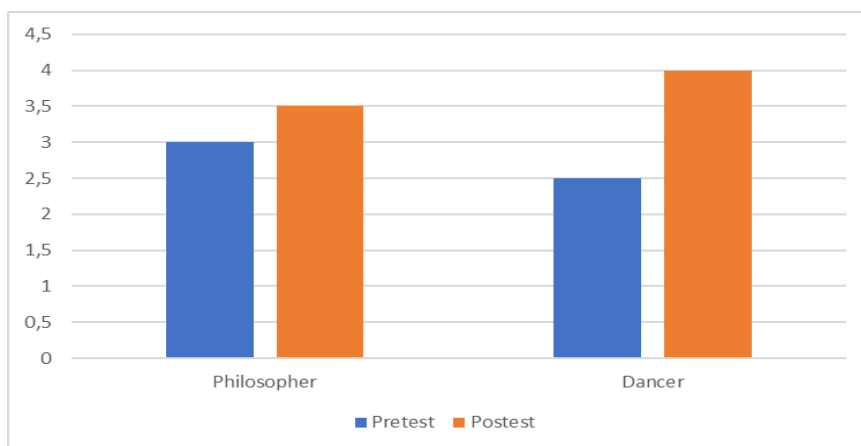


Figure 3 Equilibrium evolution in the participants.

V. DISCUSION AND CONCLUSION

The work experience with students with Down syndrome confirms the relevance of the teachers as an active member of an inclusive community next to parents. They both should assume the role of guides of the children's learning process, including oral expression (Perpin án, 2018); and equilibrium (Delgado et al., 2019), as part of their integral development process. Such challenges demand trained teachers to work students with educational special needs associated with the disability but, mainly people involved with the improvement of the inclusive education en Ecuador (Corral et al., 2015). Thus, it is ratified the need to invest in scientific research and inclusive education (Bravo et al., 2013). The redesign of

the educational buildings for improving the access of students and teachers with physical disabilities, educational technology installations, curricular adaptations, learning environments, etc., to improve the interaction between student-teacher-parents and working on the construction of really inclusive communities.

The authors of this work express agreement with the statements of Motta (2013), and Posada (2014), when arguing about the contribution of games to avoid those alienating, boring classes, etc., resulting from the traditional model of education still applied in Ecuador; because, games have the power to improve the participation of children with and without special needs in the educational environments (González, Solovieva, and Quintanar, 2014), and advance towards the universal education

The dancer:

She did not have always the disposition to play the games proposed during the sessions in this research. She shows characteristics of a singer and dancer girl but, when she has her menstrual period, she became an annoyance person.

She showed a limited advance in her oral expression because of her strong personality. It is a frequent condition in children with Down syndrome. She showed signals of the Emperor syndrome such as competitive behavior, but also impulsive love emotions. People with emperor syndrome try to impose his or her desire, tantrums in public places, authoritarianism, etc. Thus, she only does the things she wants to do, and when she wishes to. In this case, she did tantrums some days because she wanted to play basketball instead of the oral skills games especially when the class was less dynamic or involve more cognition, attention, memory, and reasoning. She shows apathetic, tends to incline the head, and avoids answer to any questions.

The team of researchers observed that she is highly competitive; therefore, a rating table of compliance was administrated to stimulate her to work. This activity motivated her to cooperate and doing voluntarily most of the practices.

However, her progress in equilibrium was outstanding because, she loves sports; thus, she reached in equilibrium the local standard of children without Down syndrome.

The philosopher:

He shows a willingness to learn, executes the games, and practice for developing his oral expression from the begging to the end of the sessions. He shows the characteristic of an intellectual boy. According to the psychologist, it is the result of early-age stimulation supported by his family. In this case, the presented unhealthy pulmonary condition, because of the exposition to cold temperatures during a family trip, caused, he missed classes for 2 weeks. Nevertheless, despite his absences, he continued to improve because of his self-motivation to practice oral expression and equilibrium at home. He shows outstanding progress because he has the disposition to learn and has a positive mood. He loves the thing that involves cognition and tries to do well the practices. However, it has been observed he needs to improve his self-confidence to advance to more complex equilibrium levels. The results showed outstanding progress on his modulation, rhythm, and intonation of his oral expression.

From the analysis of the data obtained with the psychosocial approach, it is ratified that the natural psychological and physical changes of the adolescent age generate in this learner new socio-emotional factors that influence on their motivation for learning, school performance, and relationships personal with peers and family.

Finally, both cases studied in this research project (the philosopher and the dancer) do have different evolution of oral expression and equilibrium, which are related to their interest and family support.

CONCLUSIONS

This work concludes that oral expression quality and the equilibrium can be developed successfully in children with Down syndrome when, recreational games are introduced such into the formal education procedures, as into the traditional therapies.

The training of muscles using games is a relevant contribution to improve the participants' oral expression and equilibrium.

A wide range of games that require a few simple materials available in schools were chosen and administrated during this researching process. However, the participants' personality and family background, and their disposition to play influenced in the final results.

This research project finds that recreational games can help children to reduce the stress generated during traditional classes and therapies. Games help to develop also children's self-confidence to speak (oral expression) and execute more complex body movements (equilibrium). Moreover, this experience ratifies that equilibrium helps children with Down syndrome cultivating better attitudes for learning. Finally, the earlier the games are introduced in academic work with children with Down syndrome, the better results will be obtained

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