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THE INCORPORATION OF MUSIC IN THE LEARNING OF MATHEMATICS IN EARLY EDUCATION -5 YEARS- IN TWO EDUCATIONAL INSTITUTIONS OF THE UGEL HUÁNUCO, 2024.

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Summary
The Daniel Alomía Robles National University (UNDAR) has three main objectives: professional training, scientific research and social responsibility. It trains professionals in Music Education and the Arts, who then join the Public Teaching Career of the Ministry of Education (Minedu) or private education, complying with the regulations of the National Curriculum of Regular Basic Education (CNEBR). However, it has been observed that in many educational institutions there is a weak articulation of the curricular area of Art and Culture with other areas, such as Mathematics. This research aims to describe how early childhood education teachers (5 years old) in two educational institutions of the UGEL Huánuco integrate music in the learning of mathematics. The research approach is qualitative, descriptive and phenomenological in design. The sample included two teachers and seventeen parents. Through interviews and technical documentary analysis of the pedagogical folders, it was evident that although music is mainly used to maintain order in the classroom, its direct integration in the teaching of mathematics is minimal. Parents, on the other hand, are unaware of the relationship between music and mathematics, which limits their ability to support their children at home. The results suggest the need for greater training in the integration of musical projects within the teaching of mathematics to improve the quality of education at the initial level.

Keywords: Music, Learning with Music, Teaching, Mathematics, Pedagogical Methods.

INTRODUCTION

Education at the initial level is fundamental for the cognitive, emotional and social development of children. In this context, the integration of artistic disciplines, such as music, into the educational process can have a significant impact on the learning of abstract concepts, such as those found in mathematics. Music is not only a medium for creative expression, but it is also a powerful tool for the development of cognitive and socio-emotional skills, which are crucial in the early stages of school learning (Gardner, 2019). Various studies have shown that musical learning is related to improvement in mathematical skills, such as the development of number sense, the ability to recognize patterns, and problem solving (Sánchez, 2022; Pandi, 2022).

According to the approach proposed by Peru's National Basic Education Curriculum (CNEB) (Peruvian Ministry of Education, 2016), learning must be comprehensive, promoting not only the cognitive development, but also the emotional and social development of students. In this sense, art-related competencies, specifically music, should be an integral part of curriculum planning. Despite this, in many educational institutions, especially at the initial level, the integration of music with other curricular areas, such as mathematics, is still insufficient. Music, on many occasions, is relegated to a secondary role, used mainly for classroom management or entertainment, instead of being a pedagogical tool that favors meaningful learning in other areas, such as mathematics.

The link between music and mathematics has been widely studied. According to Piaget (1985), the development of cognitive abilities in children is profoundly influenced by their ability to organize and structure the world through symbols and abstract concepts, something that music can facilitate. In his theory of multiple intelligences, Gardner (2019) suggests that musical intelligence is one of the most important forms of intelligence, as it is closely linked to other forms of reasoning, such as logical-mathematical. Empirical research has shown that music favors children's ability to recognize patterns and sequences, skills that are fundamental in learning mathematics (Pandi, 2022).

For example, Pandi (2022) highlights that musical activities such as singing, the use of instruments, and participation in musical games allow early childhood children to develop skills related to logical sequencing and problem-solving, competencies that are fundamental for mathematical learning. Likewise, Sánchez (2022) shows that music facilitates the understanding of abstract concepts in mathematics, such as proportion, rhythm, and spatial structures, by creating sound patterns that children can identify, reproduce, and transform.

In addition, music favors the development of socio-emotional skills, such as concentration, memory, and attention, which are essential for effective learning (Miranda, 2019). By integrating music into math teaching, children not only improve their cognitive skills, but they also feel more motivated and engaged in their learning. Music, being a playful and emotionally enriching activity, helps children to maintain attention and facilitates the learning of complex mathematical concepts in a more natural and fun way.

In the Peruvian context, the CNEB (2016) establishes that early childhood education must develop the necessary competencies for children to solve problems of quantity, shape, movement, and location, competencies that are closely related to mathematical learning. However, as pointed out by Gómez, Matías, and Pablo (2021), teachers often do not sufficiently incorporate musical strategies that strengthen these competencies. In fact, in many classrooms, music is limited to unstructured activities, such as greeting or farewell songs, without explicit integration with the math curriculum. This shows a gap in the pedagogical application that this research seeks to address.

The objective of this research is to explore how early childhood education teachers in two educational institutions of the UGEL Huánuco integrate music in the learning of mathematics, observing the curricular planning, the pedagogical strategies used and the perception of teachers and parents about this integration. Through a qualitative and descriptive approach, it is expected to provide empirical evidence on current practices and offer recommendations to improve the integration of music in the teaching of mathematics in early education.

DESCRIPTION OF THE PROBLEMATIC REALITY

In recent decades, education has faced a fundamental challenge: how to effectively integrate artistic disciplines into the teaching-learning process of conventional curricular areas, such as mathematics. Education at the initial level, in particular, is in a key position to promote the integral development of children, since at this stage the foundations of cognitive, emotional and social competencies are laid that will be decisive for the future of students. However, in many educational institutions, there is a modest integration of music in the teaching of areas such as mathematics, despite the obvious benefits that music can bring to children's learning (Gardner, 2019).

Music is a discipline that, at its core, encourages creativity, concentration, motor coordination, and emotional expression, making it a powerful educational tool. According to Bruner (1997), learning should be based on active exploration and discovery, and music facilitates this type of learning by involving multiple areas of the brain, thus favoring the integration of knowledge. The relationship between music and mathematics, although not always explicit, has been widely documented. According to Piaget (1985), children's cognitive development processes are linked to their ability to organize and understand patterns, which is a fundamental principle in both mathematics and music. In this way, musical activities can be an effective means for the development of mathematical skills, such as the understanding of patterns, sequences and spatial relationships.

However, in the Peruvian educational context, a concern has been identified regarding the poor integration of music with mathematical learning, especially at the initial level. Despite the fact that the National Curriculum for Basic Education (CNEB) promotes a comprehensive education that should encompass both artistic and mathematical development, teaching practices in many cases fail to combine these areas effectively. In their analysis of the educational situation in Peru, Gómez, Matías, and Pablo (2021) highlight that, although music is used for recreational activities, its explicit link with the learning of mathematics is still minimal and superficial. This lack of integration may be linked to several factors, such as the lack of specific training of teachers in methodologies that combine music and mathematics, the scarcity of adequate educational resources, and the lack of a pedagogical vision that values the potential of music as a pedagogical tool in the teaching of mathematics.

The evaluation carried out by the Ministry of Education of Peru (2017) in its report on the National Assessment of Learning Achievements (ENLA-2023) reveals that primary school students have low performance in mathematics, which underscores the urgent need to review the pedagogical strategies used. 11.2% of students in the second grade of primary school reached the satisfactory level in mathematics, while more than 40% were placed in initial levels of

learning. This reflects a significant challenge in the teaching and learning of mathematics in the early stages of basic education.

The CNEB (2016) establishes that the area of Social Personnel, which includes artistic competencies, must be integrated with other curricular areas, such as mathematics. However, music is often limited to being an auxiliary or complementary activity, without a methodological approach that facilitates its integration into mathematical teaching. As Dewey (1998) points out, education must be a dynamic process in which the different disciplines are related in a coherent way to promote meaningful learning. Music, when used in a planned way and for a pedagogical purpose, can help students develop mathematical skills such as problem-solving, perception of spatial relationships, and understanding sequences and patterns (Sánchez, 2022).

Therefore, it is necessary that early education, especially in contexts such as those of the educational institutions of the UGEL Huánuco, revalues music as a pedagogical tool that can enrich mathematical learning. The integration of music in the teaching of mathematics would not only favor the cognitive development of children, but could also improve the motivation and commitment of students to learning this area, so fundamental in their school training.

This research seeks to understand how early childhood education teachers in two educational institutions of the UGEL Huánuco approach the integration of music in the learning of mathematics, identify existing practices and propose recommendations to improve the articulation of these two fundamental areas of the school curriculum. Through a qualitative and descriptive approach, it is expected to provide evidence that allows a better understanding of the current situation and provides tools for educational innovation in this context.

GENERAL PROBLEM

How do the teachers of early childhood education -5 years- in two educational institutions of the Ugel Huánuco, 2024, incorporate music in the learning of mathematics?

SPECIFIC ISSUES

- What similarities and differences exist in the curricular planning of the teachers of early childhood education -5 years old- related to the incorporation of musical projects in the learning of the competence solves problems of quantity in two educational institutions of the Ugel Huánuco?
- What similarities and differences exist in the curricular planning of the teachers of early childhood education -5 years old- related to the incorporation of musical projects in the learning of the competence solves problems of form, movement and location in two educational institutions of the Ugel Huánuco?

JUSTIFICATION OF THE INVESTIGATION

The incorporation of music in the teaching of mathematics, especially at the initial level, has a significant impact on the integral development of children, since it favors not only cognitive learning, but also emotional, social and motor development. The need to integrate music into early education responds to a global context that recognizes the importance of an education that not only focuses on the exact sciences, but also values artistic and creative areas as effective means for the integral formation of students (UNESCO, 2016). In this sense, the integration of music in the learning of mathematics is presented as an innovative pedagogical strategy that can transform the way in which children perceive and understand mathematical concepts.

The research is mainly justified because, in many educational contexts, music is still a discipline relegated to the background, despite its potential benefits for learning other fields such as mathematics. Although the National Curriculum for Basic Education (CNEB) in Peru establishes that artistic competencies should be addressed together with other curricular areas, such as mathematics, in practice, their integration is scarce and is often limited to recreational or entertainment activities (Ministry of Education of Peru, 2016). According to the report of the National Assessment of Learning Achievements (ENLA-2023), Peruvian students have low performance in mathematics, which underscores the urgent need to review the pedagogical strategies used in the classroom, especially in early education. Numerous studies have shown that music has positive effects on the development of cognitive skills essential for mathematics. Music not only enhances skills such as attention, memory, and concentration, but also improves children's ability to recognize patterns, sequences, and spatial relationships, skills that are essential for solving mathematical problems (Sánchez, 2022; Pandi, 2022). According to Bruner (1997), the educational process must be active and experiential, and music offers an ideal medium for this type of learning, since it involves multiple senses and facilitates the connection between previous and new knowledge.

In addition, music in the early education classroom can contribute to the creation of a positive and stimulating environment, which favors the motivation of students and the construction of a positive attitude towards the learning

of mathematics. According to Dewey (1998), education should be a process that awakens the interest and curiosity of students, and music has the ability to make children actively involved in the learning process, transforming the classroom into a dynamic space full of opportunities for discovery.

The study is also relevant because it addresses the need to strengthen teacher training in methodologies that effectively integrate music with other curricular areas. Teacher training is a determining factor in educational quality, and the incorporation of musical projects in the teaching of mathematics requires a deep knowledge of the pedagogical potential of music (Gómez, Matías & Pablo, 2021). Teachers often lack the tools to integrate these disciplines effectively, limiting their ability to take full advantage of the educational benefits of music. This study seeks to provide evidence that can guide teachers in the implementation of didactic strategies that promote the connection between music and mathematics, and, consequently, improve the quality of learning in early education classrooms.

Finally, the research is of importance for teacher training institutions, as it offers an innovative approach to mathematics teaching that can enrich the professional training of future early childhood education teachers. Through this study, we seek to promote a change in current pedagogical practices, in which music is used more actively and strategically to teach mathematics, providing students with a more complete and meaningful educational experience.

OBJECTIVES

GENERAL OBJECTIVE

To describe how early childhood education teachers -5 years old- in two educational institutions in Ugel Huánuco, 2024, incorporate music in the learning of mathematics.7

SPECIFIC OBJECTIVES

- Identifying the similarities and differences that exist in the curricular planning of early childhood education teachers -5 years old- related to the incorporation of musical projects in the learning of competence solves problems of quantity in two educational institutions of the Ugel Huánuco.
- Identifying the similarities and differences that exist in the curricular planning of early childhood education teachers -5 years old- related to the incorporation of musical projects in the learning of competence solves problems of form, movement and location in two educational institutions of the Ugel Huánuco.

METHODOLOGY

The methodological approach of this research is designed to explore how early childhood teachers (5 years old) integrate music into mathematics learning, specifically in the educational institutions of the UGEL Huánuco. To achieve this objective, a qualitative approach is used that allows a deep and detailed understanding of the educational phenomenon in question. The choice of this approach is justified by the need to explore the experiences, perceptions and practices of teachers and parents, as well as the way in which music is integrated into curricular planning and mathematics teaching.

QUALITATIVE APPROACH

The qualitative approach focuses on understanding social phenomena from the perspective of the participants, allowing a holistic interpretation of the educational context. According to Creswell (2014), this approach is ideal when seeking to understand the experiences and perceptions of individuals in a specific context, which in this case involves analyzing how teachers perceive the relationship between music and mathematics and how this integration takes place in the classroom. Qualitative research also allows us to explore in depth the way in which parents perceive the impact of music on their children's mathematical learning, which is essential to obtain a complete picture of the phenomenon.

RESEARCH DESIGN

The research design is descriptive and phenomenological. The descriptive approach allows the collection of detailed information on teaching practices and parents' perceptions, in order to obtain a clear vision of the educational reality in the institutions of the UGEL Huánuco. This type of design also facilitates the analysis of the implementation of musical projects in curricular planning and its relationship with mathematical learning, as described in the National Curriculum for Basic Education (CNEB) (Ministry of Education of Peru, 2016).

The phenomenological design was selected to capture the essence of the experiences lived by teachers and parents in relation to music and mathematics. According to Van Manen (1990), phenomenology allows us to understand how people experience a phenomenon and how they perceive their environment, in this case, the relationship between music and mathematics. This design is particularly useful for exploring participants' emotions, beliefs, and attitudes toward integrating music into math learning.

POPULATION AND SAMPLE

The research population is composed of early childhood education teachers and parents from two educational institutions of the UGEL Huánuco. A non-probabilistic sampling approach has been selected for convenience, since the research will be carried out in the educational institutions available in the study area. The sample includes two teachers and seventeen parents, which allows obtaining a representative view of the experiences and perceptions of the participants.

Non-probability sampling is justified due to the need to obtain specific information from people who have direct experience in the study phenomenon. According to Hernández, Fernández, and Baptista (2014), this type of sampling is appropriate when seeking an in-depth analysis of a small group of participants with specific knowledge about the research topic. The selected teachers are those who teach at the initial level and have experience in the integration of music in their classrooms. Parents were selected based on their availability and willingness to participate in the research.

DATA COLLECTION TECHNIQUES AND INSTRUMENTS

For data collection, two main techniques will be used: unstructured interviews and documentary analysis. The unstructured interview allows for flexible and open exploration of teachers' and parents' experiences, beliefs, and perceptions about the integration of music into mathematics instruction. According to Kvale (1996), unstructured interviews allow rich and detailed data to be obtained, resulting in a deep understanding of the phenomenon from the perspective of the participants.

An interview guide will be made with open questions for teachers and another for parents, in order to explore their experiences and perceptions about music in the teaching of mathematics. The interviews will be recorded and transcribed for later analysis. This approach will identify the ways in which teachers integrate music into their mathematics lessons and how parents perceive the impact of these practices on their children's learning.

The documentary analysis will focus on the teachers' pedagogical folders, which contain the lesson plans and learning projects. According to Arias (2006), documentary analysis is a useful technique to obtain information about the curricular organization and pedagogical strategies used in the classroom. This analysis will identify whether music is explicitly included in mathematics curricula and how it relates to the mathematical competencies of the CNEB (Ministry of Education of Peru, 2016).

DATA ANALYSIS PROCEDURE

The data collected will be analyzed using the content analysis approach. This approach allows information to be organized and categorized into themes or patterns that emerge from the data (Hernández et al., 2014). The analysis of the interviews will be carried out through the coding of the answers, identifying categories and subcategories related to the integration of music in mathematical learning, the perceptions of teachers and parents, and pedagogical practices in the classrooms. The documentary analysis will also follow this approach, identifying the categories related to the planning of musical projects and their link with mathematical competences.

The analysis process will be iterative, allowing categories and topics to be refined as the data is reviewed. According to Miles and Huberman (1994), content analysis is a flexible and effective technique for gaining a deep understanding of complex phenomena such as the integration of music into mathematics teaching.

ETHICAL CONSIDERATIONS

This study will be conducted following the ethical principles established in educational research. The confidentiality of the information collected and the anonymization of the participants will be guaranteed. All participants will receive a detailed explanation about the purpose of the research and their willingness to participate. They will be asked to sign an informed consent form prior to the interviews. In addition, the right to privacy will be respected and it will be ensured that the data is used exclusively for academic purposes.

RESULTS

4.1 The interviews conducted with the teachers of the IEIs "A" and "B", according to the phenomenological design, aimed to understand and describe the phenomena from the educational perspective, focused on their opinions and experiences. The interview guide was designed based on the study's Categorization Matrix, which contains categories, subcategories, and indicators to collect the information.
The following results were obtained:

TECHNIQUE: INTERVIEW WITH TEACHERS

Items	**I.E.I. "A"**	**I.E.I. "B"**	**Comparative analysis**	**Categories**
1. How do students experience music in the classroom during the development of the math session?	We have the moments and in the musical workshop. I program music with my children, we have a dramatization workshop, art and also music. In the first two months they have brought home instruments already made with recycled materials and with that we work, for example, sounds, also silence, we accompany with those instruments the songs that we teach, the melody together with the instruments. We work with projects and within the projects are the workshops.	Yes, we plan, but we program it in the workshops. It's very important. The real kids learn a lot from music. In the music workshop, for example, we plan the music with the little flags. with his body, with his voice, the chant, the movement below sometimes not only with instruments, but also with her little body, with shoes. those with their palms, with their heads, with their shoulders, their waists, and they begin to sing, then, for the sake of mathematics, we say, how much applause did you have?	Both institutions recognize the importance of planning and the relevance of music in student development, but their approaches and strategies present significant differences where music is used on a small scale as a pedagogical tool to teach mathematical concepts in a playful way	Planning and organization • Musical sensitivity • Participation • Movement
2. How do students develop their musical creative processes during the learning of mathematics ?	I think that music has always been to develop both hemispheres. When I am developing the area of mathematics suddenly they are not attentive so I turn on the music I make clapping movements according to the music, then that makes it activate again and I can capture the attention of my children again, I make a kind of pause	Ah, for example, they imagine, My, they tell me, I'm tired of the tambourine and now I'm going to do it with a bass drum, but I don't have this imagining that I played my bass drum. They are already discovering what they think, who will have the hype. So, yes, I have Mis because my dad plays or the guitar, so other instruments are	Both institutions recognize the importance of music as a tool to activate and stimulate the brain, but their approaches and strategies present significant differences. In I.E.I. "A" music is mainly used as a resource to capture and maintain the attention of students, favoring a more active and	**Student Experience** • Initiative • Participation • Imagination

	to activate those neurons, I think that music is related to the area of mathematics also when the child has more musical movement that will stimulate more Your neurons	increasing where they are going to bring it. You can imagine.	participatory learning; while I.E.I. "B" music is used as a means to develop creativity and imagination. In both cases there is almost no music in mathematics	
3. How do students positively perceive music during math learning sessions? Describe examples.	Music is in all areas, specifically in the area of mathematics, children take it positively because they are ready, as I say, children are like a sponge, they capture everything, they are attentive and to movements	Thanks to music I have been able to discover that there are talented children and even singers, I did not know that they were singers and they were singers, not even the parents knew, for example, the broom flower sings, white hair and the boys accompany him to the rhythm of the music, now it is going to be November 22, the day of talent, Let's do an activity	Both institutions recognize the value of music in the teaching-learning process, in all curricular areas to promote a comprehensive development of students. It does not focus on the area of mathematics, the use of music as a tool to facilitate learning and discover musical talents.	**Musical integration** • Learning • Comprehensive development • Skills
4. How do students negatively perceive music during math learning sessions? Describe examples.	From what I have been able to observe, my children from Girasoles like the music, the dances, they are in full movement, since last year I have taught them that rhythm, so they are already used to it	Yes, it worries me, but little by little we are going to make the child start to like it. And if we succeed, the child already starts dancing.	Both institutions agree that, over time, students get used to and enjoy musical activities. In I.E.I. "A" they like music and in I.E.I. "B" some children incorporate a taste for music; however, they do not explicitly indicate it in the development of mathematics activities.	**Perceptions** • Familiarity • Interest
5. How does music motivate the development of mathematics learning sessions?	I think it's a positive way, it's an instrument, it's a card up my sleeve, when the children are inattentive we can at the beginning of my session, at the end of the session, it's like saying a motivation that suddenly is not in my curricular programming, but I use music to motivate my children to be	In initial it is concrete materials, you have to bring material that is experiential, that is more meaningful for children to wake up. In the psychomotor classroom, we also bring softer music and the child begins to calm down or sing and in this way we motivate the children to music.	Both institutions agree that music is an effective tool to increase student motivation and can be adapted to different moments and learning contexts. Likewise, the creation of music encourages the development of creative skills. They are generic expressions where it	**Cognitive processes** • Motivation • Meaningful Learning • Experiences

	ready to attend and they too, for example, in a workshop we have created music and they have put the melody on; of the melodies that they listen to at home then it is also helping me to learn from them because suddenly I did not listen to that music so I had to get home and look for and have the melody and follow the rhythm with them		is notorious that music is not specifically planned for mathematics activities.	
6. How does music contribute to the development of students' memory and other cognitive processes during math learning sessions?	For example, we work in assembly and with music, for example we do movement, I put on the music and according to the music we clap, we make silence, then the child is attentive to the music and what follows the sequence, then it is motivating them to be attentive and if I am not mistaken, suddenly the other child is going to clap and I am going to clap twice, then they will be attentive to the music and the sequence we are proposing according to the music.	So, the children, what talent, have learned the lyrics of "Amor pañaco" because they loved it. So, music also helps memory a lot. They already internalize the music, the lyrics, they relate how music is written enormously, for me in the part, for example, when you say relate, also in mathematics we talk about those terms of relationships.	Both institutions recognize the value of music for the development of memory and other cognitive processes in the learning of mathematics. I.E.I. "A" focuses on the development of motor and auditory skills through sequences and rhythms. While the I.E.I. "B" establishes a more direct connection between music and mathematical language, using songs and lyrics to reinforce concepts; so it is inferred that music is minimal during mathematics activities.	**Cognitive processes and mathematics** • Sequence • Mathematical relationships • Sequences • movement
7. How does music promote positive emotions in students during math learning sessions?	The child expresses, there are moments you at first glance see that the child is motivated suddenly another child you invite him, there are times that they manifest a little of home and they come suddenly with some problems, but the music when you enter the interior you	So, music is like a therapy and for them I have also seen children who absorb everything and then they replicate it in their spaces, but those are also children who are talents, but sometimes because of ignorance I told them you don't want to dance, you don't want to sing, no music, no.	Both institutions recognize the value of music to generate positive emotions in students during math learning sessions. In the I.E.I. "A" music is used spontaneously and flexibly, taking advantage of the right moments to generate a positive atmosphere and	**Emotional well-being and Benefits of Music** • Motivation • Regulates behaviors • Engagement for learning

	propose we are going to sing, of what they have suddenly been a little sad that motivates them then you forget at home about what happened and they are involved in our work Change your face	It even regulates the behavior of the little ones when there is music.	motivate students. In the I.E.I. "B" uses music in a more structured way, creating specific spaces for musical expression and emotional regulation. In this sense, music does not intervene specifically during mathematics activities.	
8. What everyday musical activities do you use to count objects, measure teeth, play board games, or sing songs that introduce number concepts in a natural and fun way?	I use the tambourine, sounds I hit one, two then I use there is a song "under a button", they are songs that "we are quoting one, two, three our motivation part of a song can be for the child to count	They themselves have to realize how many ingredients have been used, what we have done, they verbalize what they touched and counted, what they observed and they draw it and if it represents the numbers, what number will go, there are specific songs for example I love Dora, the explorer a song where they are taught everything	Both institutions agree that music is an effective tool to make the learning of mathematics more attractive and meaningful, therefore, there are attemptsand/or adaptations to make music within mathematics activities.	**Musical activities** • Instruments • Songs • Count • Verbalization
9. What math games, songs, activities, or stories do you use to encourage discussion and brainstorming about number concepts?	For example, we make an approach in mathematics, first the experiential with the body, we pose the problem, for example, of a song we are going to change the ending or the character, the child gives his proposals for example one, two, three for example with the song if it rhymes and everything we contrast if it works it does not work as I tell you not only the area of mathematics is involved the area of personal communication, when communicating express compare to see if this song works	Dora the explorer. that I put on it and there are the colors and then we talk about what colors they talked about, about such a color and what will there be, what color will be missing? So the children say, no, black, no, there was. The other says yes, the conflict begins, yes or no. Then we double-check if it's true or not. So they find out and we see how the children also imagine.	Both institutions agree that social interaction is fundamental for learning mathematics. The proposed activities encourage the development of critical thinking and the ability to solve quantity problems using different languages but not the use of music.	**Learning activities** • Songs • Introduction of music-related math concepts • Social Interaction

	out and the other group then they are comparing			
10. During everyday activities, what musical strategies do you use to compare quantities, calculate distances, or estimate waiting time, to develop number sense and mathematical intuition?	In the permanent activities we play music, we do the counting and everything, with the tables they count, but not musical. If we have a greeting song, the time for the child to play in the sectors and for example notice there is 10 minutes left and I put the song to save and I relate them to that the children listen to the song to save to save and the child knows that he has to save everything because the hour is over, So but in the other activities we suddenly lack time, for example half an hour that is not enough for me so I have to suddenly prioritize some learning that is going to come out my chronological	For example, as I say, Dora, the frog explorer, the turtle... how culture advances, how the collection advances, the races, there are songs and then we talk about what I said, who won, who lost.	Both institutions agree that music helps children develop an intuitive understanding of numbers and quantities, relating music to everyday activities makes learning mathematics more meaningful. It is inferred that music is minimal in the development of mathematics activities.	**Developing math skills** • Permanent activities • Count • Number Sense

	calendar, so that is what I have left.			
11. How do you use songs, rhymes, or musical stories to relate geometric shapes to the real world?	Yes, when I have worked on geometric figures you can no longer say "triangle" with music we related, they looked in the classroom for objects that have that same shape, now when we have worked on programs I also had music and I looked for silence so I have worked There are counting songs, colorful figures that we have used suddenly videos have also seen the children, we have danced, we group, etc.	Those are my strategies, we say that it is respected, if my little friend goes in front, he goes behind, how am I going to do, and there are songs too, exit, slowly, everything is music here.	Both institutions agree that the use of precise and specific language is essential to develop the concept geometrically with everyday experiences. It makes learning more meaningful. The combination of different senses (sight, hearing, touch) facilitates the understanding of geometric shapes. However, the teachers do not specify the names of the songs or music to relate to geometry	**Strategies for relating geometric shapes and the real world** • Compare • Notions in front, behind • Forms
12. How do students use chants or music to recognize and apply directional terms (up, down, forward, backward, left, and right) when indicating the location of objects in space?	There is a song "up, down", "the little spider" sometimes we work and so much and we don't remember at that moment the child listens and relates to it without me telling him he has heard and relates it upstairs to the side I turn around he is getting to know his space motivating himself through music	The strategies, we do with their body. For example, children, let's play the wolf, now, let's see how we will put on the wolf, and we make the circle, what shape have we made? The circle. So, now we stand on the edge of the table. Everyone on the edge of the table. What form will we have formed with the children? Ah, the rectangle, all right. If we were to stand on the edge of the window, what shape? Ah, square and so, then, everything is with the body, then with concrete material, which the muscle manipulates and discovers.	Both institutions use a variety of strategies to teach directional terms using musical songs. The combination of music, movement, and language creates multisensory experiences that make it easier to learn math.	**Pedagogical approach** • Songs • Game • Challenging Questions
13. What songs, musical games or dances do you use for students to	There is the spider, the little hen Silvana, the sun, when the morning comes the afternoon, there is a notion of night, but	We first with the body and who is on the right, on the left, who goes to the center, who goes inside, who goes outside, who is	Both institutions use the combination of music, movement, and language and create multisensory experiences that	**Understanding the real world** • Spatial notion • Body movements • Dance

require the understanding and application of spatial relationships?	they are music and according to my programming It is a permanent work we are rehearsing dances ahead to the right	the butler, where the butler stands, is it close, is far away and so on, definitely mathematical with dance	facilitate meaningful learning of mathematics.	

MATRIX 1: COMPARATIVE ANALYSIS OF THE INTERVIEW WITH TEACHERS AND THE CATEGORIZATION OF QUALITATIVE INFORMATION ON THE INCORPORATION OF MUSIC IN THE LEARNING OF MATHEMATICS

SYSTEMATIZATION OF THE PROCESS OF CATEGORIZATION OF TEACHERS' INFORMATION

The preliminary categorization process of the interview with the teachers was as follows:

STARTING CATEGORIES

To. Planning and organization
B. Student Experience
C. Musical integration
D. Perceptions
And. Cognitive processes
F. Cognitive processes and mathematics
G. Emotional well-being
H. Benefits of Music
I. Musical activities
J. Learning activities
K. Developing math skills
L. Strategies for relating geometric shapes and the real world
M. Pedagogical approach
N. Understanding the real world

4.2 The interviews applied to the parents of the IEIs "A" and "B", according to the phenomenological design, had the intention of understanding and describing the phenomena from the perspective of the parent focused on his opinions and experiences. The interview guide was designed based on the study's Categorization Matrix, which contains categories, subcategories, and indicators to collect the information.
The following results were obtained:

GENERAL PERCEPTION OF MUSIC IN MATHEMATICS LEARNING

In general, parents seem to have a positive perception of music, highlighting its benefits for their children's learning. However, many of them were not fully aware of how music relates specifically to learning mathematics. Some parents mentioned that their children learn songs related to numbers or perform counting activities with music, indicating that, although they do not always explicitly link music with mathematics, they recognize its value in the educational process. Some parents claimed that music facilitates their children's concentration and improves memory, supporting the idea that music can have positive effects on cognitive abilities essential for mathematics, such as attention, memory, and numerical problem-solving (Miranda, 2019; Sánchez, 2022).

PERCEIVED BENEFITS OF MUSIC FOR COGNITIVE DEVELOPMENT

A significant portion of parents noted that music contributes to their children's cognitive development. The responses suggest that children are more motivated to learn and show greater interest in math concepts when they are accompanied by musical activities. In addition, it was mentioned that children learn in more fun and meaningful ways, which could improve their attitude towards learning mathematics.
Some parents also mentioned that their children are more receptive to math activities when they are presented in a playful way through music. This is consistent with Dewey's theory (1998), which argues that learning should be active

and engaging, and music, as a pedagogical tool, has the power to make students more deeply engaged with academic content.

EMOTIONAL AND SOCIAL DEVELOPMENT THROUGH MUSIC

The analysis also suggests that music has a significant impact on children's emotional and social development. Several parents mentioned that music helps children feel happier, calmer, and more motivated to participate in activities. It was also highlighted that music can be a way to channel emotions, which favors a positive learning environment.
These findings are consistent with the studies of Gardner (2019) and Piaget (1985), who state that music not only stimulates cognitive development, but also emotional and social development. In this case, it seems that music plays an important role in fostering an emotionally safe environment that supports learning in general, including math.

PERCEIVED LIMITATIONS IN THE APPLICATION OF MUSIC IN MATHEMATICAL LEARNING

Although most parents recognized the benefits of music, some pointed to limitations in implementing math-related music activities. A considerable number of parents expressed that they are unaware of the musical projects that are carried out in their children's classrooms, which indicates a lack of effective communication between teachers and families. In addition, some parents stated that they could not reinforce mathematical concepts at home through music, since they did not receive enough information about the musical activities implemented in the school.
This lack of knowledge can be a significant barrier for parents to effectively support their children's learning at home. This highlights the need to improve communication between teachers and families, providing them with the necessary tools and resources so that they can collaborate in the educational process more effectively (Gómez, Matías & Pablo, 2021).

HOME PRACTICES TO REINFORCE MUSIC AND MATH LEARNING

Several parents indicated that, at home, their children use songs for counting, adding and subtracting, or simply to have fun while learning. However, many parents do not use songs specifically designed to teach math, suggesting that music in the home is geared more toward entertainment than reinforcement of math concepts.
Some parents mentioned that when children learn songs with math themes, such as counting or addition, they tend to remember numbers and sequences better. This underscores the idea that songs can be an effective means of reinforcing math concepts in a natural and fun way. In addition, some parents mentioned that their children enjoy singing and moving while learning, which reinforces the idea that the combination of music, movement, and learning is powerful for the acquisition of mathematical skills.

4.3 The analysis of the teachers' pedagogical folders to verify the incorporation of musical projects in mathematics competencies showed the following results:

RELATED TO THE OVERALL OBJECTIVE

I.E.I. "A"	**I.E.I. "B"**
Learning Project 1 shows in activity 2, 4 and 6, the resolution of quantity problems with the songs "walking, walking", how many fingers?, a song without considering musical projects in depth. In the aforementioned activities, the songs "to keep" and "farewell" related to other types of curricular competencies are planned.	In learning project 1; in activity 4 the resolution of problems of form, movement and location is appreciated, the song "Who came today?" without considering musical projects in depth .
Learning project 2 evidences the development of a musical project "The dance of numbers" globalized with competition solving problems of shape, movement and location.	In learning project 2; There is no evidence in the planning of activities in the area of mathematics and/or musical projects.
Learning Project 3 presents in activity 3 the resolution of quantity problems with the songs "it	

itches, it itches me" without considering musical projects in depth. In the aforementioned activities, the songs "limpia" and "despedida" related to other types of curricular competencies are planned.	
Learning Project 3 shows in activity 7, the resolution of quantity problems with the songs "the secondary colors (tonada – the plague)" and "the colors in English" without considering musical projects in depth. In activities 5 and 6, the songs "limpia" and "despedida" related to other types of curricular competencies are planned.	. In Learning Project 3 in solving quantity problems, in activities 3 and 4 no activities related to quantity are planned.
In Learning Project 4, the resolution of quantity problems with the songs "to the rhythm of the music" and "the colors in English" is programmed without considering musical projects in depth. In activities 4 and 9, the songs "limpia" and "despedida" are planned related to other types of curricular competencies	In Learning Project 4 in solving quantity problems, in activity 7 no songs are planned
Learning Project 5 shows in activity 7, the resolution of quantity problems through the "beat of music" without considering musical projects in depth. In the aforementioned activity, plan the songs "limpia" and "despedida" related to other types of curricular competencies.	In learning project 5, the development of a musical project "We guess sounds" is evidenced, globalized, with the competition solving problems of quantity. In activity 3 and 9, no songs are planned.
In Learning Project 6, activities 5, 7 and 8 show the resolution of quantity problems with "musical rhythms of national holidays and usual songs", "national anthem", "march of flags", "musical round", "creole song", "party for national holidays" without considering musical projects in depth. In the aforementioned activities, the songs "limpia" and "despedida" related to other types of curricular competencies are planned.	. In learning project 6 in activity 2 no songs are planned
Learning Project 7 shows in activity 9 the planning of the "clean" and "farewell" songs related to other types of curricular competencies.	In learning project 7; in activities 2 and 4 the resolution of quantity problems is appreciated, with the songs "Pequeño pez", "los días de la semana" and the dance "una semillita" without considering in depth musical projects
In learning project 8, the development of a musical project "The dance of numbers" is evidenced, globalized with competition solving problems of quantity. In activity 4, 5 and 7, the resolution of quantity problems is appreciated, with the songs "Ritmo A gogó", "5 pececitos" and "veo, veo" without considering musical projects in depth. In activities 2, 3, 4, 8 and 9, the songs "limpia" and "despedida" related to other types of curricular competencies are planned;	. The development of two musical projects is evident: One "Suenan los zapatos" and two "Arriba y abajo aprendo a hablar" globalized with the competition solves problems of quantity. In activity 2 no songs are planned

In learning project 8, the development of a musical project "The dance of numbers" is evidenced, globalized with competition solving problems of quantity. In activity 4, 5 and 7, the resolution of quantity problems is appreciated, with the songs "Ritmo A gogó", "5 pececitos" and "veo, veo" without considering musical projects in depth. In activities 2, 3, 4, 8 and 9, the songs "limpia" and "despedida" related to other types of curricular competencies are planned .	. In learning project 8 the development of two musical projects is evidenced: One "Sound the shoes" and two "Up and down I learn to speak" globalized with the competition solves problems of quantity.

RELATED TO SPECIFIC OBJECTIVE 1

Results of the comparative analysis of the Pedagogical Folders to verify the incorporation of musical projects in the learning of the competence solves problems of quantity.			
Specific Objective 1:	**I.E.I. "A"**	**I.E.I. "B"**	**Comparative**
Identifying the similarities and differences that exist in the curricular planning of early childhood education teachers -5 years old- related to the incorporation of musical projects in the learning of competence solves problems of quantity in two educational institutions of the Ugel Huánuco.	In learning project 8, the development of a musical project "The dance of numbers" is evidenced, globalized with competition solving problems of quantity.	In learning project 5, the development of a musical project "We guess sounds" is evidenced, globalized, with the competition solving problems of quantity. In learning project 8 the development of two musical projects is evidenced: One "Sound the shoes" and two "Up and down I learn to speak" globalized with the competition solves problems of quantity.	• From April to October, both institutions have developed 8 learning projects. • Both institutions plan the development of musical projects by globalizing with the competition solving problems of quantity. • In the same period, the IEI "A" has only planned one learning project : the development of a musical project "The dance of numbers", globalized with the competition, solves problems of quantity. • From April to October, the I.E.I. "B" has planned three learning projects in the development of musical projects: "We guess sounds", "the shoes sound" and "up and down, I learn to speak", globalized with the competition solves problems of quantity.

CONSIDERING SPECIFIC OBJECTIVE 2

Results of the analysis of the pedagogical folders to verify the incorporation of musical projects in the learning of the competence solves problems of form, movement and location.			
Specific Objective 2:	**I.E.I. "A"**	**I.E.I. "B"**	**Comparative**
Identifying the similarities and differences that exist in the curricular planning of the initial -5 year old- teachers related to the incorporation of musical projects in the learning of the competence solves	In learning project 2, the development of a musical project "The dance of numbers" is evidenced, globalized with competition	It is not evident in the annual planning or in the planning of the activities musical projects related to solves problems of shape, movement and location.	• From April to October alone, the I.E.I. Carlos Showing Ferrari has planned a learning project: the development of a musical project, globalizing with the competition, solves problems of form, movement and location.

problems of form, movement and location in two educational institutions of the Ugel Huánuco.	solving problems of shape, movement and location.		• From April to October, the IEI Maria Montessori-Aula has not planned learning projects in the development of globalized musical projects with competition solves problems form, movement and location.

INCORPORATING MUSIC INTO MATH LEARNING

In the process of categorizing the study, with a qualitative approach, the following were assumed as the guiding category: The integral development of the student in order to strengthen music and mathematics; the subcategories: Design and development of the educational process, learning and development, and student experience; and the indicators: Pedagogical approach, planning and organization, musical and learning activities, strategies to link music with mathematics, cognitive processes, development of mathematical skills, integral development, integration of music, experiences, perceptions, emotional well-being and benefits of music.
The category, subcategories and indicators were generated from the interviews with teachers and parents; and of the pedagogical folders; as shown in Figure 1.

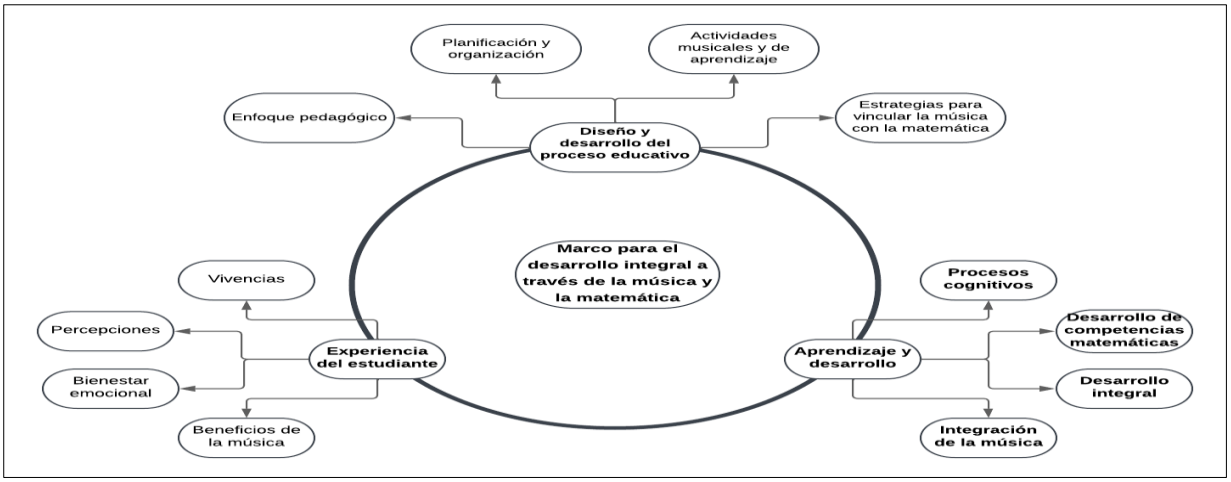

FIGURE 1. RELATIONSHIP BETWEEN GUIDING CATEGORY, SUBCATEGORIES AND INDICATORS

INTERPRETATION

The Framework for the Integral Development of the Learner, through Music and Mathematics, presents the following orientation:

- ✓ The subcategory learning and development is related to the design and development of the educational process in terms of the planning and organization of the teaching-learning process, from the selection of mathematical content to the choice of musical activities and the evaluation of results using relevant strategies within the framework of the competency-based approach.
- ✓ The subcategory design and development of the educational process connects with the student's experience by focusing on their perspective, including their experiences, motivations, attitudes and how they perceive the learning process in the search for the benefits that music can bring to their emotional well-being.
- ✓ The subcategory student experience is articulated with learning and development, encompassing the cognitive, affective, and social changes (components of integral development) that they will seek as a result of the integration of music with the development of mathematical competencies.

RESULTS

The discussion phase was carried out by summarizing and comparing the products of the surveys (to teachers and parents) and the Pedagogical Folder; and with the objectives, the categories achieved and the Theoretical Framework, the Triangulation Process was carried out, obtaining the following results:

According to the general objective, to describe how teachers of early childhood education -5 years- in two educational institutions of the Ugel Huánuco, 2024, incorporate music in the learning of mathematics; the teachers of the I.E.I. Carlos Showing Ferrari and María Montessori in the interviews demonstrated from their experience that music is fundamental for the significant learning of mathematics, however, they affirm that specifically artistic projects very little link it with the teaching of mathematics. With respect to the interviews with the parents, they acknowledge that they have no knowledge about the link between the teaching of mathematics and musical projects.

Sánchez (2022) states that music is part of life, providing countless benefits such as creating personal ties, stimulating memory, allowing knowledge to be acquired, and promoting creativity, among others. Likewise, Pérez, C. & Sánchez, M. (2023) concluded that music education is not approached with the same importance as traditional sciences, despite its great contributions to the development of cognitive abilities and, especially, socio-emotional skills. It is necessary to delve into more in-depth studies, with more diverse data, on how music and these initiatives can contribute to Peruvian children; and why not, dream of it being included in the National Curriculum.

Regarding the first specific objective, identifying the similarities and differences that exist in the curricular planning of early childhood education teachers -5 years old- related to the incorporation of musical projects in the learning of competence solves quantity problems in two educational institutions of the Ugel Huánuco; the teachers of the I.E.I. Carlos Showing Ferrari and María Montessori in their curricular planning demonstrated that they plan musical projects on a small scale, globalizing with the competition solves problems of quantity.

Miranda (2019) states that music is important in the development of the children of the Initial Educational Institution 05 – Andahuasi. Music, in early education, is an essential element for the educational field; since it allows a better cognitive, cognitive, emotional and psychomotor development of children. Pandi, D. (2022) also details that musical activities such as: playing instruments allows you to follow sequences, repeating sounds helps in counting numbers; Likewise, musical games make it easier to recognize geometric figures and make movements with the thin and thick parts of the body to follow musical graphic patterns.

Regarding the second specific objective, to identify the similarities and differences that exist in the curricular planning of early childhood education teachers -5 years old- related to the incorporation of musical projects in the learning of competence solves problems of form, movement and location in two educational institutions of the Ugel Huánuco; the teachers of the I.E.I. Carlos Showing Ferrari and María Montessori in their curricular planning demonstrated that they plan musical projects on a small scale, globalizing with the competition solves problems of form, movement and location.

Gomez, Matias, & Pablo (2021), states that it can be assured that the application of the Toddler Games program generates significant effects on the development of competence solves quantity problems in children in Early Childhood Education.

CONCLUSIONS

1. INTERVIEW WITH TEACHERS

a) General objective

- ✓ The comparative analysis of the unstructured interview with the teachers of early childhood education Carlos Showing Ferrari and María Montessori shows us that the musical aspect for the development of mathematical competencies is minimal and without considering in the planning the articulation of musical projects with mathematics; however, it is perceived that in practice they use musical strategies to maintain order and create an environment conducive to learning in the other curricular areas.
- ✓ In the two public educational institutions, the National Curriculum of Regular Basic Education (CNEBR), approved by RM No. 281-2016, of the Ministry of Education, is assumed and diversified.

b) Specific Objective 1

- ✓ Teachers encourage the exchange of ideas by practicing songs, stories or games related to other learning activities, in order to introduce concepts, compare and interact to solve problems of quantity, using different languages but not specifically using music.
- ✓ The teachers agree that music helps to develop an intuitive understanding of numbers and quantities in everyday activities, making the development of mathematical skills meaningful.

c) Specific Objective 2

- ✓ In the new pedagogical approach, teachers use a variety of strategies to teach directional terms using musical songs where the combination of music, movement and language creates multisensory experiences that contribute to facilitating the learning of mathematics.

- ✓ Teachers, when developing the understanding and application of spatial relationships, associate them with the understanding of the real world, trying to facilitate the learning of mathematics linked to spatial notion, music and body movements.
- ✓

2. INTERVIEW WITH PARENTS

a) General objective

- ✓ Parents, when reinforcing their children's knowledge, state that they do not know about musical projects related to mathematics, therefore, they cannot effectively help their children.
- ✓ Parents, by reinforcing what they have learned in the Kindergarten, about how they experience music in the learning of mathematics, state that there are perceived benefits that include greater ease of learning and better concentration of the children.
- ✓ At home, parents require methodological information to reinforce the children's learning, in order to experience music in the learning of mathematics, according to what was developed by the teacher in the classroom.
- ✓ At home, when reinforcing children's knowledge, there is very little indication that students relate music to mathematics, this connection does not seem to be very strong or explicit, in most cases.
- ✓ Parents state that, by reinforcing children's knowledge, music serves as a complement to the concentration and memorization of some learning, helping to develop cognitive processes related to movements and problem solving.
- ✓ According to what was stated by the parents, in the reinforcement of children at home, rhythm and melody seem to be elements that influence learning associated with coordination, movement and emotional development.

b) Specific Objective 1

- ✓ Parents, in order to reinforce children's learning, state that musical strategies can strengthen motivation, attention and retention of information about number sense linked to frequency, perception and rhythm.
- ✓ At home, by reinforcing children's learning, games, songs, activities, or stories are rarely used to encourage discussion of number concepts.

c) Specific Objective 2

- ✓ In the reinforcement of learning, at home, by parents, they do not know musical strategies to strengthen the relationship of geometric shapes with the real world.
- ✓ At home, when reinforcing children's learning, it is very difficult for parents to actively incorporate music to recognize the shape or size of objects due to the lack of information in the programming developed by the teacher.
- ✓

3. PEDAGOGICAL FOLDER

a) General objective

- ✓ The curricular programming, in both educational entities, is designed based on the (thirty-one) competencies of the National Curriculum of Regular Basic Education (CNEBR) in force.
- ✓ Minedu, through the CNEBR, presents the curricular areas of: Social Personnel with two competencies related to the critical appreciation of artistic-cultural manifestations and the creation of projects from the artistic language; and Mathematics, two competencies associated with the resolution of problems of quantity and shape, movement and location.
- ✓ Teachers carry out curricular diversification according to the competencies and capacities of the CNEBR and the sociocultural reality of their educational institution, considering the levels, rhythms and learning styles of their students.
- ✓ Early childhood teachers apply the globalization approach in the educational process, when designing projects and learning activities for their students. In these innovative designs, compared to the other curricular areas, the integration of the competencies and capacities of the curricular areas of Social Personnel with Mathematics is infrequent.
- ✓ In the CNEBR the aforementioned competencies and capacities of the Personal Social curricular area, as can be seen literally, are only regulated on art, as a totality that integrates the 7 disciplines.
- ✓ At the initial education level, due to the characteristics of the students, the projects are developed through learning activities.

- ✓ The teachers recognize the importance of planning and organization so that students experience music in the development of the learning session; but their strategies differ when using music on a small scale to strengthen memory, participation and activity.
- ✓ Teachers, according to their professional training, incorporate a small proportion of musical content in the learning of mathematics into their curricular programming.
- ✓ The teachers, when programming the educational experiences, associated with the development of their musical creative processes during the learning of mathematics, in both classrooms, the influence of music on mathematics was very poor.
- ✓ In the curricular programming, the teachers recognize the value of music to generate positive emotions, during the math sessions linked to motivation, involvement and well-being for the student's learning.
- ✓ The teachers, when planning the activities in the classroom, agreed that music motivates, in some way, the development of the learning sessions by generating cognitive processes associated with experiences and meaningful learning.

b) Specific Objective 1

- ✓ There is a lot of similarity in the curricular planning of both teachers, with respect to the incorporation of musical projects in the learning of the competence that solves problems of quantity.
- ✓ EI Carlos Schwing F., in learning project 8, develops the musical project "The dance of numbers" globalized to the competition solves problems of quantity; and EI Maria Montessori, in learning project 8, develops two musical projects "Suenan los zapatos" and "Arriba y abajo aprendo a hablar" globalized with competition solves problems of quantity.

c) Specific Objective 2

- ✓ At the initial educational level, due to the characteristics of its users, the students' learning sessions are developed through projects and learning activities.
- ✓ In curricular planning, there are some differences in both institutions, with respect to the incorporation of musical projects in the learning of the competence that solves problems of form, movement and location.
- ✓ EI Carlos Schwing F., in learning project 2, develops the musical project "The dance of numbers" globalized with competition solving problems of form, movement and location; and at IE Maria Montessori, to date, no musical projects related to competition have been planned.

RECOMMENDATIONS

1. INTERVIEW WITH TEACHERS

2.

a) **General objective**

- ✓ According to the results of this study, institutions that train teachers of Music or Art in institutes and/or universities should assume its conclusions and recommendations in order to update their curricula in order to train competitive professionals who exceed the requirements of the national competitions to access the Public Teaching Career of Minedu and/or private educational entities.
- ✓ The training of early education teachers, in addition to knowing pedagogical management, requires a permanent update in the scientific foundations (pedagogical, psychological and didactic) of the curricular areas that they develop through projects and didactic activities with their students.
- ✓ There is an urgent need to unify criteria and integrate pedagogical actions between teachers and parents so that reinforcement at home is relevant. Teachers can apply an innovative methodology; the parents, the traditional one that they applied in their childhood or youth.
- ✓ It is vitally important to implement a quality approach in early education, emphasizing the need for trained teachers, adequate resources, and a nurturing learning environment.
- ✓ Early childhood teachers are in charge of an entire educational level, unlike secondary education teachers who only develop one or two curricular areas, in Regular Basic Education (EBR); so its updating must be permanent.
- ✓ In the perspective of continuous improvement, it is necessary to improve the quality of early education with the implementation of innovative projects related to the incorporation of music in the learning of mathematics.
- ✓ Despite the common approach, there are likely to be significant differences in the way each teacher implements this perspective. These variations could be related to factors such as available

resources, teacher training, student characteristics, and the particularities of the educational context of each institution.

- ✓ Factors such as interactions with teachers, proposed activities, and classroom environment may influence how children experience learning through music and mathematics.

b) **Specific Objective 1**

- ✓ In the development of the learning sessions applying new didactic strategies, it is essential to inform parents in a timely manner so that the educational actions are consistent with the needs and expectations of students of all educational levels.
- ✓ It is important to master didactic strategies to develop music and mathematical content related to the resolution of quantity problems in learning spaces (classroom, sports field, playground, among others).

c) **Specific Objective 2**

- ✓ Permanent teacher training, at the level of initial education, is necessary in strategies, methods, techniques and didactic procedures, in order to meet with versatility the process of globalization and integration of curricular areas, such as the understanding of the real world facilitating the learning of mathematics linked to the notion of space and body movements.

3. INTERVIEW WITH PARENTS

a) General objective

- ✓ Parents, in order to reinforce the knowledge of their children at home, require permanent information through experiential presentations on the work that the teacher does in the classroom.
- ✓ The reinforcement carried out by parents, when relevant, is of great help in strengthening children's learning, especially when it comes to innovative projects, such as the incorporation of music in mathematics learning.

b) Specific Objective 1

- ✓ Parents, in order to reinforce the children's learning, require permanent communication with the teacher so that the student feels happy and supported by strengthening activities related to numerical concepts linked to solving quantity problems.

c) Specific Objective 2

- ✓ It is necessary that parents, when reinforcing learning at home, have information from the teacher about musical strategies to strengthen the relationship of geometric shapes with the real world.
- ✓ At home, when reinforcing children's learning, it is necessary for parents to have advice so that, if an innovative project is developed, they contribute to actively incorporating music to recognize shape, movement and location in the area of mathematics.

4. PEDAGOGICAL FOLDER

a) General objective

- ✓ It is vitally important that preschool teachers master the National Curriculum of Regular Basic Education (CNEBR) of Minedu, in order to carry out the curricular programming, following its guidelines and provisions.
- ✓ The pedagogical training of the initial teacher, when scheduling the learning sessions, considers with great criteria and relevance, the rhythms, levels and learning styles of their students due to their repercussions in the present and the future.
- ✓ In higher education institutions, which train art teachers for the RBE levels, it is essential that their curriculum considers mastery in the performance of musical instruments, especially at the initial level.

b) Specific Objective 1

- Early childhood education teachers could unify their projects and activities, with respect to the incorporation of musical projects in the competition solves problems of quantity, in order to use the same strategies and didactic resources.

c) Specific Objective 2

- It would be convenient for preschool teachers, when programming the mathematical competence, to solve problems of form, movement and location; incorporate musical projects into their curricular programming.

BIBLIOGRAPHIC REFERENCES

1. Angel, R. (2013). Music and its role in the formation of the human being [Article, Faculty of Social Sciences of the University of Chile]. Institutional Repository.
2. Arbulú Jurado, C. E. (October 2023). Definition of inductive research method. Cusco. Retrieved from https://www.researchgate.net/publication/374900049
3. Bustamante, Carlos;. (October 01, 2023). What should a pedagogical folder have? Retrieved August 30, 2024, from SIAGIE Peru: https://siagie.top/que-debe-tener-una-carpeta-pedagogica/
4. Cano, E., & Imbernon, F. (August 2003). The teaching portfolio as an instrument for the professional development of university teaching staff. Interuniversity Journal of Teacher Training, 17(2), 43-51. Retrieved from https://www.redalyc.org/pdf/274/27417204.pdf
5. Narval School. Teaching cooperative. (November 27, 2023). The relationship between music and mathematics. Retrieved July 18, 2024, from Narval College: https://colegionarval.org/relacion-entre-musica-y-matematicas/
6. Coronas Valle, P. (2000). Euterpe and Pythagoras. Filomúsica(11), 1-3. Retrieved from https://filomusica.com/filo11/paula.html
7. Galán-Mañas, A. (2019). The teaching folder. Instrument for the evaluation of teaching quality. EccoS Scientific Journal(51). Retrieved from https://www.redalyc.org/journal/715/71566554012/html/
8. Gato Castillo, M., Amador Mesa, M. E., & Olivera Valdez, A. (2021). Interdisciplinarity between Mathematics and Histology. Second Virtual Congress of Basic Biomedical Sciences in Granma. Basic Biomedical Sciences in Granma. Manzanillo, Manzanillo. Retrieved from https://cibamanz2021.sld.cu/index.php/cibamanz/cibamanz2021/paper/viewFile/471/348
9. León Torres, F. (2016). Giving and reflection. A phenomenological investigation. Bogotá: Universidad Nacional de Colombia. Retrieved from https://www.google.com.pe/books/edition/Daci%C3%B3n_y_reflexi%C3%B3n_una_investigaci%C3%B3n/Fxa_DwAAQBAJ?hl=es-419&gbpv=1&dq=investigaci%C3%B3n+fenomenol%C3%B3gica+pdf&printsec=frontcover
10. Marradi, A., Archenti, N., & Piovani, J. I. (2018). Manual of Methodology of the Social Sciences. Twenty-first century.
11. Piñero Martín, M. L., & Rivera Machado, M. E. (2017). Qualitative Research: Procedural Guidelines.
12. Tójar Hurtado, J. C. (2006). Qualitative research Understanding and acting. Madrid: La Muralla. Retrieved from https://books.google.co.ve/books?id=lXcdV7aLbWcC&printsec=copyright&hl=es#v=onepage&q&f=false
13. UNITE THE UNIVERSITY ON THE INTERNET. (July 12, 2024). Teaching music with the Orff method: keys and characteristics. Retrieved from https://www.unir.net/humanidades/revista/metodo-orff/.
Ausubel, D. (1983). Educational psychology: a cognitive point of view. Mexico: Trillas.
14. Bruner, J. (1997). Education, the door to culture. Spain: Machado Grupo de Distribución S.L.
15. Permanent Commission of the Congress of the Republic. (2003, July 28). General Education Law No. 28044. Official Gazette of El Peruano. Retrieved from http://www.minedu.gob.pe/p/ley_general_de_educacion_28044.pdf
16. Coronas Valle, P. (2000). Euterpe and Pythagoras. Filomúsica (11), 1-3. Retrieved from https://filomusica.com/filo11/paula.html
17. Dewey, J. (1998). Democracy and education. Madrid: Morata.
18. Fernández, P. (2019). The power of education. Lima: FCA Grupo Consultor S.A.C.
19. Gardner, H. (2019). Theory of multiple intelligences. Barcelona: Paidós.
20. Gato Castillo, M., Amador Mesa, M. E., & Olivera Valdez, A. (2021). Interdisciplinarity between Mathematics and Histology. Second Virtual Congress of Basic Biomedical Sciences in Granma. Basic Biomedical Sciences in Granma. Manzanillo, Manzanillo. Retrieved from https://cibamanz2021.sld.cu/index.php/cibamanz/cibamanz2021/paper/viewFile/471/348
21. Gómez, S., Matías, C., & Pablo, W. (2021). Toddler Games program to develop the competition solves quantity problems in 5-year-old children of the C.N.A. Unheval, Huánuco 2020. [Bachelor's Thesis, Universidad Nacional Hermilio Valdizán-Huánuco]. Institutional Repository.
22. Kuhn, T. (2004). The structure of scientific revolutions. Argentina: Fondo Cultural Económica-México.
23. León Torres, F. (2016). Giving and reflection. A phenomenological investigation. Bogotá: Universidad Nacional de Colombia. Retrieved from https://www.google.com.pe/books/edition/Daci%C3%B3n_y_reflexi%C3%B3n_una_investigaci%C3%B3n/Fxa_DwAAQBAJ?hl=es-419&gbpv=1&dq=investigaci%C3%B3n+fenomenol%C3%B3gica+pdf&printsec=frontcover
24. Ministry of Education. (2004). Basic Curricular Design of Secondary Education. File.
25. Ministry of Education. (2017). National Basic Education Curriculum. File.

26. Miranda, M. (2019). The importance of music in the development of children at the initial level of the initial educational institution 05-Andahuasi [Bachelor's Thesis, José Faustino Sánchez Carrión National University]. Institutional repository. (Arbulú Jurado, 2023)
27. Pandi, D. (2022). Musical activities in the development of mathematical skills of logical sequence in children of Early Childhood Education [Bachelor's Thesis, Technical University of Ambato]. Institutional Repository.
28. Pérez, C., & Sánchez, M. (2023). Music Education and School Performance: Student Outcomes in Reading and Mathematics of Symphony Beneficiaries [Master's Thesis, Universidad del Pacífico]. Institutional Repository.
29. Piaget, J. (1985). Psychology and epistemology. Planeta Deagostini.
30. Quiñones, A., & Huiman, H. (2022). Problem solving with Polya's mathematical method: The adventure of learning. Journal of Social Sciences, 28(5), 74-84. Retrieved from https://www.redalyc.org/journal/280/28071845006/28071845006.pdf
31. Royal Spanish Academy. (2022). Project. In Dictionary of the Spanish Language [Tercentenary Edition]. Retrieved from https://dle.rae.es/proyecto
32. Sánchez, C. (2022). The influence of music on the development of attention in the early childhood education stage [University of Seville]. Institutional Repository.
33. Sánchez, V. (2021). Music and numbers. From Pythagoras to Schoenberg. (C. d. Musical, Ed.) Cuadernos de Investigación Musical, 132-133.
34. Sipión, A., & Rivera, J. (2021). Application of fun mathematics for the development of mathematical thinking in the children of the Immaculate Girl Mary educational institution. Huánuco 2018 [Bachelor's Thesis, Universidad Nacional Hermilio Valdizán-Huánuco]. Institutional Repository.
35. Touriñán, J., & Longueira, S. (2010). Music as a field of education. Education through music and education for music. University of Santiago de Compostela. Faculty of Education Sciences, 2(22), 151-181. Retrieved from https://www.researchgate.net/profile/Jose-Tourinan-Lopez/publication/292159336_La_musica_como_ambito_de_educacion_educacion_por_la_musica_y_educacion_para_la_musica/links/56acaecb08ae28588c5fa28a/La-musica-como-ambito-de-educacion-educacion-por-la-musica-
36. UNESCO. (2016). World Education Agenda to 2030. Paris. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000245656_spa
37. Sierra Bravo, R. (2001). Social Research Techniques. Theory and exercises. Madrid, Spain: PARANINFO. Thomson Learning. Retrieved from https://significanteotro.wordpress.com/wp-content/uploads/2017/08/docslide-com-br_tecnicas-de-investigacion-social-r-sierra-bravo.pdf