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Towards a comprehensive musical education: analysis of a proposal from traditional music in four Chilean schools

Hacia una educación musical integral: análisis de una propuesta desde las músicas tradicionales en cuatro escuelas chilenas

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Abstract

Music education in Chile has yet to focus and deepen the possibilities that the use of traditional music can have as an interdisciplinary learning resource. As a result of this problem, this research focused on the relevance and value that traditional music can have as a comprehensive and interdisciplinary learning tool in formal music education. The research analyzed the implementation and results of a proposal for the sixth year of basic education with a pedagogical approach based on the idea that the music that we transfer to formal education cannot be separated from the experiences, activities, knowledge and socio-cultural implications that give them meaning in their contexts of origin. Through collaborative action research, the proposal was carried out in four centers and the perceptions of the collaborating teaching staff were analyzed. The results show that the inclusion of these types of music can enrich the learning process from an integrating conception of knowledge, considering the indivisibility of the music-context-society triad.

Key words: Traditional Music; Didactic Implementation; Music; Context.

Resumen

La educación musical en Chile tiene pendiente centrarse y profundizar en las posibilidades que puede tener la utilización de músicas tradicionales como recurso de aprendizaje interdisciplinar. A raíz de esta problemática, esta investigación se centró en la pertinencia y relevancia que pueden tener las músicas tradicionales como herramienta de aprendizaje integral e interdisciplinar en la educación musical formal. La investigación analizó la implementación y los resultados de una propuesta para sexto de Educación Básica con un planteamiento pedagógico basado en la idea que las músicas que trasladamos a la educación formal no se pueden desvincular de las vivencias, actividades, conocimientos e implicaciones socioculturales que les dan sentido en sus contextos de origen. Mediante la investigación-acción colaborativa, se llevó a cabo la propuesta en cuatro centros y se analizaron las percepciones del profesorado colaborador. Los resultados reflejan que la inclusión de estas músicas puede enriquecer el proceso de aprendizaje a partir de una concepción integradora de los saberes, considerando la indivisibilidad de la tríada música-contexto-sociedad.

Palabras claves: Músicas tradicionales; implementación didáctica; música; contexto.

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1. Introduction

This article discusses the possibilities of reflection and action that traditional music can have in the context of formal education and how it can enrich, from an integral and interdisciplinary perspective, the learning process in the music classroom.

Music education in Chile has been present in the curriculum developed by the Ministry of Education throughout the last decades (Poblete, 2010), although such presence has not always been synonymous with quality (Valverde, 2018). Moreover, since the educational reforms promoted at the end of the 1990s, the presence of music has gradually weakened. It is necessary to highlight that this problematic does not only concern the Chilean context, but on the contrary, it is observed in an increasingly recurrent way in different countries, as indicated by López-García (2018) regarding the current situation in Spain or the example in Latin America of Guatemala and Uruguay. One reason for this trend could be found in the neoliberal character policies that have been imposed in the educational field (Angel-Alvarado *et al.*, 2021), in which the role of Art in education is secondary, prioritizing those disciplines that are more explicitly linked to labor training (Aróstegui, 2017; Jorquera, 2019; Cano, & Ordóñez, 2021; Rodríguez-Quiles, 2021).

The presence of music education in Chile has been decreasing since the implementation of the 2012 educational reform (Orbeta-Green, & Oyanedel-Frugone, 2019; Valdivia, & Angel-Alvarado, 2021). This reform, on the one hand, reduced the number of hours destined to Music class in the second cycle of basic education and, on the other hand, presented new Curricular Bases and study programs, in which, considering its first versions, it was not even possible to identify work units (Pino, 2015; Valverde, 2018). This situation has been gradually reverted thanks to several modifications, currently counting such programs with titles for each unit. At this point, it is important to highlight that the curricula prior to 2012 had specific work units, in which traditional music –both of native people and those corresponding to the different areas of Chile and Latin America– had a space reserved for their learning, especially in basic education.

In view of the vacuum generated and the lack of space given to traditional music in the formal curriculum, the design, implementation and evaluation of a didactic proposal was proposed to address the inclusion of this music from an interdisciplinary and comprehensive perspective, aiming to enhance their inclusion in the classroom. As a result of this process, this article presents the perceptions of the teachers who implemented the didactic proposal in their classrooms and the results achieved.

2. A contextualized music education

Critical pedagogy suggests approaching music education by considering the relevance of one's own culture, focusing on the past as well as the present and the future. At the same time, it wants to free teachers and their students from the generation of stereotypes about music, encouraging them to generate their own critical, empowered and active thinking (Polo, & Pozzo, 2013; Ferreira, & Garrido, 2019). In this way, a deep awareness emerges when students and teachers know who they are (Abrahams, 2010). From this perspective, the role of the teacher is to understand how to enhance the search for an identity through different music. To this end, the music educator has the responsibility to know different repertoires even without being an expert

in each of them (Jorquera *et al.*, 2020), but being aware of the cognitive processes, social experiences and ways of learning that are present in cultures and human beings (Martí, 2000, Polo, & Pozzo, 2013, Mendívil, 2016) and how all these factors can contribute in a certain way to the integral development of the student body.

Music education should be understood as a discipline that transits between the artistic and the cultural and that is, in essence, interdisciplinary in nature. Beyond what it contributes at a technical level from the discipline itself, it develops students in their different human dimensions (socioemotional, communicative, organizational or creative, among others) and promotes critical thinking focused on the assessment of social problems (Small, 1989; Berbel *et al.*, 2020; Zamorano *et al.*, 2022).

For music education to be meaningful and become part of the integral formation of students, it must be understood from the perspective of "an education through music" (Cremades, 2008; Touriñán-López, 2011; Polo, & Pozzo, 2013). It implies to stop conceiving school music education as an end in itself, focused on the purely musical, and to avoid stripping the musical fact of all the significant richness coming from the context in which it is given (Elliott, 2001). Therefore, in order to channel this educational approach, it is necessary to consider the elements that involve the social and cultural context in which music education takes place. For this reason, it should be valued that music goes beyond the physical walls of educational centers and reaches the social fabric of its environment, considering that the relationships between the structures of music and societies are deeper than what is usually made visible (Abrahams, 2010; Angel-Alvarado, 2021).

In short, musical practices are continuously influenced and impregnated by the sociocultural context in which they are developed (Cremades, 2008). From a pragmatist approach, empiricism and experience will make learning meaningful. In the case of sounds, this meaning will be conditioned by the use and function given to them from a social practice (Small, 1989; Cremades, 2008). In this sense, the praxial explanation of "good music" is, above all, a question of "what it is good for" (Regelski, 2009).

3. Understanding traditional music and its presence in schools

According to Harper (2011), traditional music are defined taking into account that: 1) they are predominantly orally transmitted music, 2) they are associated with traditional culture from an integral perspective of a people or place, 3) the same melody can appear in different geographical points, adapted and with specific qualities of the place and 4) they should not be understood as old since new creations can be considered within this category. Starting from the second characteristic, and in agreement with authors such as Dunbar-Hall (2009), Martí (2000) or González-Martín & Valls (2015), introducing this type of music in the classroom should go hand in hand with an approach to the culture with which it is linked.

Along these lines, traditional music in schools should be justified on the basis of their own cultural contexts, as claimed by authors such as Davis (2009). For this reason, it becomes a priority for teachers to exercise a pedagogical practice in which the relationship between students and their classrooms and recreational spaces are dynamic. The educational understanding that must consider the treatment of traditional music in school must include that their meaning is

inseparable from the conditions in which they are generated and experienced (Polo, & Pozzo, 2013; Valverde, 2018; Jorquera *et al.*, 2020; Martínez-Rodríguez, 2021).

The importance of the use of traditional music as a school learning resource does not only lie in their sonic particularities or in their close link with the social and cultural context, as it is described above. It also has to do with certain forms of transmission and informal learning, which contain enriching elements for the didactics of music in formal education, in the sense proposed by Green (2002). For this reason, the specialist teacher has a fundamental relevance as the main mediator between the music in its specific context and the enriched learning that students can develop. In short, it involves a process of adaptation of informal knowledge to the formal educational context (Green, 2002; Carrillo, & González-Moreno, 2021).

In the Chilean context, although the presence and use of traditional music in the classroom has not had a significant development –beyond the proposals or motivations of teachers and small brushstrokes present in the Curricular Bases– in the last decade, an increase in the practice and development of this music by younger age groups has been observed. This is mainly due to the dissemination role of social networks or platforms such as YouTube, which has displaced television as the main means of mass communication and transmission of culture (Rivera, & Carriço, 2015).

Thus, it is now common to observe on social networks such as Facebook, Instagram or Tiktok, among others, how "comparsas", bands and different groups of traditional music are being formed. In the case of northern Chile, both brass bands and the well-known "comparsas de Lakitas"[4] are mostly made up of young people and even children. At this point, it is relevant to highlight that, in the case of "comparsas de Lakitas", there are groups formed only by women (Sippa, 2019; Cortés, 2020), a situation that a few years ago was absolutely unthinkable. In the case of the central zone, the phenomenon of massification and valuation of traditional music has gone in the same direction, being normal nowadays to see, as examples, "ruedas de cuecas"[5], meetings of singers and singers or meetings of "payadores"[6]. The same happens in the south of Chile, specifically in the Araucanía region, where Mapuche music has gone beyond the ritual spaces of its own people to approach urbanity through genres such as Hip hop or metal (Forno, & Soto, 2015; Rekedal, 2019; Koplow, 2022).

From an empirical perspective, it has been possible to observe a series of initiatives by teachers of the specialty aimed at achieving a greater appreciation of traditional music in the classroom (Valverde, & Casals, 2019). In any case, there is a lack of studies that allow us to see if this inclusion has a systemic and transversal character in the educational curriculum and, therefore, a real educational impact.

4. Methodology

In order to analyze the use of traditional music in the classroom from an integral approach to education, an analysis of the implementation of a proposal created from this perspective was

[4] Instrumental groups formed by plastic sikus and percussion (bass drum, snare drum and cymbals).
[5] Gathering of "Cueca" culture in an informal context, where they get together to sing in a group.
[6] Payadores are popular singers who are related to the culture of the oral tradition in Chile and who improvise lyrics accompanied by the guitar.

proposed based on the perceptions of the teachers who carried it out. The proposal was designed and implemented in the context of a collaborative research (Casals et al., 2008). For this reason, there were four collaborating teachers who developed the didactic proposal in their classrooms, participating, in turn, in a feedback process with the responsible researchers.

In order to know the perception of each teacher participating in the implementation process, both open and semi-structured interviews were conducted. Under the principles of grounded theory, specifically the constant comparative method, we proceeded to analyze the discourse of the collaborating teachers emanating from the interviews, recording comments once they were concluded in order to make way for the open and then axial coding process. Once the audios were transcribed, the properties of the categories generated were delimited (Bonilla-García, & López-Suárez, 2016).

4.1. Context: Didactic proposal

This proposal was structured on the basis of a work unit for the sixth year of elementary school (students between 11 and 12 years of age) called "Traditional festivals in the classroom" and was based on previous fieldwork on traditional music present in the Tarapacá region (Chile) (Valverde, 2018). Some of the examples addressed there were selected under the criterion that they were part of popular religious festivities. This music was present in the accompaniment of dances performed by the communities participating in the festivities, in collective songs, procession parades, in addition to martial music. The sonority of the brass bands[7] was the characteristic timbre that was present in all the music chosen for the elaboration of the proposal.

The learning approach had an interdisciplinary focus, assigning the same value and relevance to both the disciplinary (musical) and the ones related to the understanding of the context in which this music was developed.

In order to flesh out the didactic proposal, nine different types of music were selected, which gave shape to nine themes to be developed in class. These themes contained the following work elements:

(a) Plans for each classroom work session. These contained learning objectives, time planning for each topic, proposed activities and evaluation guidelines.
(b) Support materials for teachers such as scores, audios and video tutorials[8].

4.2. Participants

In this study, four teachers participated with their corresponding students in the sixth grade of elementary school. A selection process was carried out in the months prior to the implementation of the proposal following the following steps:

[7] Bands of musicians consisting of trumpets, euphoniums, tubas, bass drums, drums and hand cymbals. Sometimes they also include trombones, clarinets and even saxophones. They are made up of no less than nine musicians and can sometimes have more than forty members.
[8] Material available in: https://www.ximenavalverde.com/copia-de-partituras

a) An open call was made to music teachers who were working at that time with the sixth-grade level in the Tarapacá region. This call was made through a personal database of the principal researcher.
b) Once the responses were received, there were ten teachers who expressed interest and who, in turn, covered the criteria considered for this study: breadth in administrative dependencies of the establishment in which they worked (public, private and subsidized), breadth in geographical location of these establishments (urban and rural) and breadth in years of experience in the classroom (between one and twenty-five years of experience). Finally, there were four who were interested and accepted the conditions under which the proposal would be developed in their classrooms.
c) One of the participating collaborating teachers moved to the south of the country just a few weeks before starting the implementation of the proposal. The decision was made to include him anyway, because he had a deep knowledge of the original context in which this music and traditions took place, and he had also actively participated in the organization process and in the preparation of the proposal, such as meetings and interviews, among other activities. Therefore, finally, there were three teachers who, at that time, were working in the Tarapacá region and one who was beginning to work in the Los Lagos region.
d) Regarding the criterion of type of educational establishment and location, three teachers worked in the urban context, one of whom worked in a private school and two in subsidized private schools. One of the teachers worked in the rural sector, in a public school.
e) Regarding the criterion of years of teaching experience, two of the participating teachers were in the initial stage in Chile (up to four years of professional experience), for one of them this was the second year of teaching, while for the other it was the third year. In the next bracket, from five to ten years of professional experience, there was a teacher with nine years of experience and, finally, for the bracket with more than ten years of experience, there was a teacher who at that time had twenty-two years of work in the classroom.

4.3. Instrument and procedure

For the collection and subsequent analysis of the information, in-depth interviews were used, which were applied to each collaborating teacher. The semi-structured interviews (Ruiz Olabuénaga, 2007) were based on a guide of ten questions. The methodological design defined the application of three interviews for each teacher in accordance with the different phases of the implementation process of the proposal:

a) Interview in preparation phase: it was focused from two objectives: to know the expectations that the teaching staff had around the collaborative research they would initiate and the didactic proposal and to identify the previous knowledge they had as a result of their own formative process as well as of the learning acquired from the musical praxis.
b) Interview during the development phase: its objective was to know the perception of each teacher during the didactic implementation phase in the classroom. In this

way, the teachers themselves responded according to their needs and experiences. In addition, in this interview, some initial proposals for improvement were collected in response to different weaknesses observed in the didactic proposal.

c) Evaluation phase interview: this was carried out once the implementation stage was over and the objective consisted in making an overall evaluation of the process undergone, contrasting the initial expectations with the reality of what was experienced in the classroom.

Questions were asked about the contribution of the proposal to their performance as teachers and to the learning experienced by their students. At the same time, their suggestions for improvement were recorded, as well as everything they considered relevant, significant and that could be useful for future didactic proposals of this type. At the end of each interview, time was allowed for the participating teachers to express any additional ideas, reflections or criticisms that had not been included in the interview.

4.4. Categories

As mentioned above, the interviews with each collaborating teacher were applied in three phases: preparation, development and evaluation of the didactic proposal. An analysis of the interviews was developed at the end of each of these phases.

The analysis of the transcribed interviews was based, on the one hand, on the relevance of the emerging concepts and their relationship with the meaning of the proposal and, on the other hand, on the reiteration of ideas. As a result of an emergent categorization, three major categories were identified, which are described below.

4.4.1. Musical richness

This category refers to the variety of musical works and strategies used in class, paying special attention to that which is new or unusual up to that moment.

4.4.2. Integral and interdisciplinary learning

This category corresponds to the range of interdisciplinary and integral possibilities identified in the use of the resources of the didactic proposal, which are focused on music, but with the vision of reaching beyond thanks to their relationship with the subjects of visual arts or physical education, among others.

Given the specific characteristics of the music worked on, the socio-cultural context in which they are generated is a central point in their use and their development in the classroom from an integral and interdisciplinary approach.

4.4.3. Teaching resources

The third category that was delimited is related to the didactic resources (collaboration with experts, videos, support materials, audiovisual resources) that this didactic proposal offered teachers for classroom work and how these could enrich learning in their music classes.

5. Results

The following is an analysis of the results from the approach of each of the categories generated.

5.1. Musical richness

The results reflect that working with this type of music in the classroom represents a challenge at the level of musical language development for the participating teachers, since the rhythmic reading of these melodies is not simple to approach. The four participating teachers agreed in valuing the importance of this music at a rhythmic and corporal development level and how it becomes a significant resource for the music class. However, in the case of the schools located in the region where these types of music are developed on a daily basis (Tarapacá), the learning was acquired more easily since this is music that is in the streets and permeate the sound environment of the city, highlighting that the element "learning by imitation or "learning by ear" was relevant in these cases.

> In this school many children are very close to the festival of La Tirana, some dance, others play or someone in their family does it, but when faced with the score it becomes very complex to learn it, so we choose to learn by ear. Since I am a party musician, I know the music and the rhythms well. So, I played the trumpet and the children played it on the flute or the metallophone. The truth is that they almost didn't see the score, because I also wrote the names of the notes on the blackboard and that made it easier to play (Teacher 3).

In the answer given by this teacher, it is possible to observe that the greatest difficulty and, at the same time, the greatest richness of this music lies in the rhythm and, in this case, clearly the influence of the environment has a positive impact on the learning of music. However, it is clear that the "learning by ear" factor is fundamental, so that other learning strategies not necessarily linked to traditional musical language must necessarily be included. For example, in this case, writing the names of the notes on the blackboard, which allowed the students to later relate them to the instruments they played.

In the case of the school in the south of the country, they opted directly for the use of other types of strategies for learning the melodies, mainly through learning by imitation and repetition. In the four cases studied, the acquisition of new learning was achieved through active listening strategies facilitated by the teachers, and in all cases, learning by listening was used over the use of sheet music, as indicated by this participant in one of the interviews:

> The rhythm of this music written in sheet music is very complicated because it has syncopations and sometimes even changes in the meter. So, for the children, learning by ear is easier and for us teachers it allows us to advance faster. So, the resources we have used here have been helpful for this (Teacher 4).

In this example, the "context" factor was left out, since for the students these types of music were not familiar at an auditory level and it was the teacher who played a leading role, guiding and orienting the students' learning process.

Also, this musical richness could be observed from the inclusion of dance as an inseparable element of music. This situation presented a new challenge for teachers in their pedagogical practices. Most of the time, the teachers of the specialty focus their work on the strictly musical dimension, stripping it of the context in which they occur and the purposes for which they are used:

> Normally we do not use dance as part of our work in music class; I personally avoid it because I do not have the necessary knowledge to approach it. In the unit of work, we danced or tried to dance diablada, some kids did it very well because they already knew it, but for me it was not easy since I am not close to this music or to the festivities of the interior (Teacher 1).

In this case, the inclusion of dance as another element of the music class was a challenge for the teacher, a challenge linked to the training weaknesses of music teachers and the limited possibilities of continuous training that they have throughout their professional life. Moreover, these difficulties are even greater when dealing with dances that do not belong to the central or southern part of the country, since the latter dances are better known and have spread more intensively throughout the country over time. The consequence of this situation would be that teachers would be at the crossroads of either approaching this learning with weaknesses or avoiding it altogether.

Notwithstanding the above, for the collaborating teachers the use of resources from dance and body movement enriched the work of their classes: "[...] personally, I find it difficult to dance in music classes, but in this unit it has been necessary to achieve the objectives and I have tried to do my best" (Teacher 3). Or this other contributor who argues the following:

> I like to dance, I know about this type of traditional dances, but in this school, it is not very common to use them in the classroom. At the beginning, the children laughed at the steps, but as the weeks went by, they took it more seriously and concentrated much more (Teacher 2).

This last example presents a different experience from those mentioned above. In this case, although the teachers knew the different dances and rhythms, they were not familiar to the students, since in their usual contexts this music is not common. However, as the weeks of work went by, it became more relevant to them, which was reflected in the later results.

5.2. Comprehensive and interdisciplinary learning

The collaborating teachers agree that the use of this music allowed the implementation of the didactic proposal to be approached from different disciplines.

> Together with the Visual Arts teacher, we did the work from both subjects. In music we played the songs and with Visual Arts we built the masks of the devils of the feast of the Virgin of Carmen de la Tirana[9]. The children had a great time during these classes (Teacher 3).

In this case, the teacher sought support in the subject of "Visual Arts", an action that turned out to be very enriching since the making of the masks enhanced the work he was doing at

[9] Popular religious festival of the Tarapacá region, Chile.

the time. The results obtained were very positive as they managed to involve other subjects of the curriculum, motivating other teachers to carry out an interdisciplinary work.

However, the teachers also agree that the beginning of the process was not so simple and motivating. They encountered resistance from the teachers responsible for other subjects, who did not show interest in the development of this didactic proposal. It was the music teachers themselves who had to approach strategies to motivate their peers, explaining the new learning from different disciplinary perspectives.

> In my school, the administration was opposed from the beginning to working with the other subjects, arguing that they had planned what they would do beforehand, so there was no time to include more content (Teacher 2).

Although this case did not constitute a tendency within the experiences collected, the lack of support and understanding on the part of the teaching staff resulted in the interdisciplinary work being affected.

One of the experiences collected focused on deepening the context in which the music took place rather than on the strictly musical:

> The children, being from the south, know practically nothing about northern festivals and traditions. So, the fact of starting the unit working from a short story and geographically locating the places of the festivities helped the students to situate themselves in a better way. In addition, giving examples where other children like them danced or played made them reflect on the cultural richness of the country (Teacher 4).

This response allows us to identify one of the main strengths of the didactic proposal and how, from a geographical and cultural contextualization, students were able to learn in a better way.

In all four cases, the implementation of the didactic unit coincided with the celebration of the winter solstice in the southern hemisphere, called “Machaq Mara”[10], a festival that takes place mainly in rural Andean communities, although each year its celebration is becoming more popular in the urban context. For this reason, the last theme of the didactic proposal was the "Cacharpaya"[11], where the focus was the farewell and the closing of cycles, as it is done in Andean contexts. In two schools, brass bands participated in this event.

> We did the activity with the children in the courtyard, but when the brass band started to play, the other classes came to watch and we invited them to dance with us. It was very entertaining for the children, and the teachers were also very happy. Of course, we let them know in advance that we would be doing this activity at that time (Teacher 1).

This teacher's response shows the interest that children and the educational community have in the participation of external guests in learning activities. In this case, learning went beyond the walls of the classroom and took place in other areas of the school.

At the same time, this activity allowed to deepen the multicultural character of this area of the country: "as our school has many children of Aymara ethnicity, it was an activity known to them. The nice thing was that we were able to be part of the rituals and have live music, with the participation of the whole school" (Teacher 3). In this case, the teacher went a step further by

[10] It is considered the New Year according to Aymara tradition and has great importance throughout the Andean world (see, for example, the study of Madrones, 2021).
[11] It is a collective dance, representative of the farewells, usually in a row and that moves forming figures in space. It is identified as a type of huayno dance.

being in a cultural environment where this activity was known by the participating students. Part of the rituals performed by the Andean communities were carried out in the real context, which enriched the learning experience.

In this same school, due to the fact that it was a rural institution, there was a reduced enrollment at that time, so this activity was carried out with the participation of the entire student body and not only with the sixth-grade students:

> The band arrived early to the school, we waited for them with breakfast and after that we did our Machaq Mara. At the end we danced the cacharpaya and the whole school participated, including teachers and directors. Everyone was very happy (Teacher 3).

It can be observed that the involvement of both the teaching staff and the educational unit as a whole was greater than could be expected considering that the musicians were expected with breakfast (the trip from the city of Iquique takes more than an hour), but also the entire student body of the school was invited to participate, a fact that constitutes, in turn, a collective learning experience.

5.3. Didactic resources

For the four teachers, this was a novel experience of classroom work, since they had not used these types of music for didactic purposes, despite the fact that they are present in the daily life of the Tarapacá region.

An important moment within the didactic resources that were used was the participation of the cultor[12] in the classroom, who was in charge of showing the different dances and how they are developed in the context of traditional festivities. This was considered an innovative resource. In two of the cases, he was present in person and in the other two, videos were made and then worked on in class by the teachers. The result was an enrichment of the students' learning, as well as that of the teachers themselves, who during the interview argued that it was the first time they had had such an experience in the classroom and that they themselves also learned from the guest.

> The dancer who was with us was very close to the children: they asked him questions and an interesting dialogue was generated. The children learned a lot, not only about the steps of the dances, but also about the meaning of the traditions of the festivities (Teacher 4).

The inclusion of the cultor arose after understanding the impossibility of separating the music studied from the dance, so it was necessary to include it as part of the proposal. The main objective was for the students to have a more global understanding of what they were learning. In addition, this point showed the interdisciplinary richness that the participation of the traditional culturist implied.

Also, brass band musicians visited the schools in two cases, and, as with the traditional cultor when live participation was not possible, videos were once again chosen. The value of the face-to-face activity favored interaction between students and musicians, since the latter were able to show their work to the students, with whom they also carried out a collective activity. One of the teachers who had the participation of the musicians in his school commented the following:

[12] Expert in his field coming from the culture of popular tradition, who has been formed through experience and oral transmission.

> The musicians came and played in the schoolyard. The children were very happy, almost as if they had never heard a band before in their lives. But the funny thing is that they have heard them many times in their neighborhoods and at parties, but they were very excited when they saw them at school (Teacher 1).

The response given by this teacher reflects the impact of these activities in the school, not only because of the fact of having guest musicians, but also because it allows students to be aware of the educational value of this music.

On the other hand, the teachers also valued positively the inclusion of learning resources (audiovisual support, scores, maps, readings with summaries for the teachers, material to work with the students in the classroom, instrumental arrangements) which represented an approach to the culture of the towns where the festivities took place. At the same time, they stated that, through these experiences, the children could have, in some cases, perhaps the only opportunity to get to know this context.

> The children at this school know practically nothing about the traditions of the native peoples of the area. Instead of traveling to the interior, they go out of the country during vacations. They are high-income families, so this experience has been the first approach to these types of music, and they had a great time dancing tinku, for example, participating a lot (Teacher 2).

This response evidences the deficiencies that can be observed in certain educational contexts. The students may not be so close to these types of music, nor to the festivities, nor to the cultural context in which they take place, despite being in the same geographic area where these manifestations take place. It is observed, then, that these students had their first approach to these cultural expressions in music class.

6. Discussion and conclusions

Taking into account that the Chilean curriculum has not gone in depth into defined epistemological guidelines and bases for the inclusion and teaching of traditional music in the classroom, the need arose to implement and analyze a didactic proposal within this framework. The results obtained provided positive answers to questions such as whether it is feasible to implement and make didactic use of this type of music in the classroom or whether it is possible to work in an interdisciplinary way with traditional music. At the same time, it opened the door to new questions and reflections, as we will see below.

What was analyzed in the discourse of the collaborating teachers allows us to infer that education is positively enriched by the inclusion of integral, transversal and interdisciplinary learning. This perspective applied to proposals related to traditional music contributes to the development of students in a global way and not only from the acquisition of knowledge and learning related to the discipline itself. Following authors such as Cremades (2008) and Regelski (2009), in this case, the so-called "good music" was directly proportional to its usefulness in the proposal.

Within this view, the need and importance of including in the classroom the cultural context where music is developed is confirmed, especially with the figure of the culturist, following what González-Martín and Valls (2015) defend. Likewise, the teachers showed the value of using learning strategies specific to this music, such as learning by ear or based on a very simple notation, following what Green (2002) proposed in relation to the valuation and use of

other forms of transmission of learning from informal contexts. When working with the music selected, and linked to their musical richness, especially at the rhythmic level, they could not be learned from music reading, so the melodies and rhythmic motifs were incorporated through learning by imitation and by ear.

As a result of the above, a relevant issue that this research highlights are related to the way of approaching musical literacy, opening a question about the relevance of its inclusion in the school or the role it should develop. Even more so if we consider that music in formal education should be understood as a means and not an end in itself and focused on human formation, as argued by Cremades (2008), Touriñán-López (2011) and Polo and Pozzo (2013), when referring to an "education for music" versus "an education for music".

Another important point observed in the data analyzed was related to the support –or lack thereof– from the teaching teams of the educational units. In this sense, and coinciding with authors such as Small (1989), Berbel *et al.* (2020) and Zamorano et al. (2022), it is necessary to reflect on the development of an integral and interdisciplinary educational activity. It is necessary to work so that the disciplinary walls become smaller and smaller and allow human development in its different dimensions. In any case, this approach also requires incorporating all the actors involved in the teaching-learning process, emphasizing that working interdisciplinarily does not mean doing isolated projects in addition to what is already being done in each subject –as they complained in one of the schools– but seeking synergies between them to work in a different way, focusing on the interrelations and the globality of knowledge.

In short, the results obtained from this study reinforce, on the one hand, the relevance that learning of an integral and interdisciplinary nature can have in formal education and, on the other hand, that the development of this integral learning –addressed in a continuous and systematic way– can provide a deeper knowledge and understanding of the diverse contexts and cultural realities in which formal music education takes place, establishing a view that goes beyond what is linked to a theoretical or technical-musical instruction approach.

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ARTICLES

Psychometric properties and standard-setting study of the Piano Performance Test for prospective teachers

Propiedades psicométricas y estudio de establecimiento de normas del Test de Interpretación Pianística para futuros docentes

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Abstract

The purpose of this study was to investigate the psychometric properties of the Piano Performance test for Elementary School Teachers and to undertake a standard-setting study for this scale. This study included three groups of participants: students (n=100), raters (n=2) used to test the psychometric features of the musical instrument performance test and experts (n=6) for the standard-setting study of the test. In this study, the researchers developed a music performance test and analytical rubric. The results showed that the one-factor structure was appropriate for the musical instrument performance test, which explained 66% of the total variance. The Cronbach Alpha coefficient showed that the internal consistency of the scale was acceptable (.83). Moreover, generalizability studies and the intra-class correlation coefficient indicated excellent rater reliability for the scale. The results of the item discrimination analysis show that the musical instrument performance test is capable of discriminating participants who had high and low levels of ability to play the piano.

Key words: Music-education; piano performance; pre-service teachers; inter-rater reliability; rubric; standard-setting.

Resumen

El objetivo de este estudio era investigar las propiedades psicométricas del test de Interpretación de Piano para Profesores de Enseñanza Primaria y realizar un estudio de fijación de estándares para esta escala. Este estudio incluyó tres grupos de participantes: estudiantes (n=100), calificadores (n=2) utilizados para comprobar las características psicométricas de la prueba de rendimiento en instrumentos musicales y expertos (n=6) para el estudio de fijación de estándares de la prueba. En este estudio, los investigadores desarrollaron una prueba de interpretación musical y una rúbrica analítica. Los resultados mostraron que la estructura de un factor era adecuada para la prueba de ejecución de instrumentos musicales, que explicaba el 66% de la varianza total. El coeficiente Alfa de Cronbach mostró que la consistencia interna de la escala era aceptable (.83). Además, los estudios de generalizabilidad y el coeficiente de correlación intraclase indicaron una excelente fiabilidad de la escala por parte de los evaluadores. Los resultados del análisis de discriminación de ítems muestran que la prueba de interpretación de instrumentos musicales es capaz de discriminar entre participantes con niveles altos y bajos de habilidad para tocar el piano.

Palabras claves: Educación musical; interpretación pianística; profesores en formación; fiabilidad entre evaluadores; rúbrica; establecimiento de normas.

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1. Introduction

Music education is an important aspect of childhood development, and including music lessons in elementary and preschool teachers' curricula can have a significant impact on children's learning outcomes (Swanwick, 2016). Research showed that music education can enhance children's language development, cognitive skills, and social-emotional well-being (Schellenberg, 2018). Furthermore, incorporating music into the preschool curriculum can help to promote creativity and foster a love of music in young children (Standley, 2016). Thus, it is essential for elementary and preschool teachers to receive training in music education and to incorporate music lessons into their daily routines in order to support the holistic development of their students. Therefore, according to Scripp and Kaufman (2019), it is essential that elementary and preschool teachers have a strong foundation in music, including piano skills. The piano is one of the fundamental instruments that provides a solid foundation for music education to provide effective music instruction for young children. Piano training can improve teachers' music literacy, provide opportunities for creative expression, and enhance their ability to integrate music into the classroom curriculum (Robinson, 2016; Guven, 2020). Scripp and Kaufman (2019) stated that piano instruction can help preschool teacher candidates gain proficiency in music theory, ear training, and performance skills, which can be applied to teaching young children. According to the research of Price and Burnsed (1989), the most needed skills in preschool and primary education are singing and playing. Piano (keyboard), is capable of creating different sounds, allows accompaniment, and lets teachers use their voice as singing or leading while playing simultaneously. By learning to play the piano, preschool and elementary school teachers gain a solid foundation in music theory, harmony, and technique, which enables them to effectively teach and guide young children in their musical development (Lee, 2009). In this regard, it is an effective musical instrument to be used in elementary school and preschool music courses.

Assessment is an integral part of the teaching process. Without a valid and reliable assessment, we cannot be sure about the quality and effectiveness of the teaching process. Piano performance assessment plays a critical role in evaluating piano performers' technical abilities, interpretative skills, and overall musicality. According to Boud (1995) performance assessment enables players to receive feedback on their musical strengths and weaknesses, as well as to identify areas for improvement. Performance assessments also provide valuable information for music teachers to adjust their instructional strategies to meet the needs of their students (Elliott, & Silverman, 2014).

Piano teachers have different scoring habits when evaluating their students' piano performance. Some teachers may use a more lenient scoring system to encourage their students, while others may use a stricter scoring system to motivate their students to improve. Research has shown that structured assessment methods, such as exams and competitions, can have a positive impact on students' motivation and self-esteem (Mak, & Fancourt, 2019). These evaluations also offer a way to assess and compare performance levels across different students and institutions, providing a common standard for excellence in piano playing (Kim *et al.*, 2021).

Different measurement tools and models have been developed to assess music performance (Abeles, 1973; Boyle, & Radocy, 1987; Watkins, & Farnum, 1954; Nichols, 1991; Palmer, 1996; Stanley *et al.*, 2002; Zdzinski, & Barnes, 2002; Juslin, 2003; Wapnick *et al.*, 2004; Wapnick *et al.*, 2005; Russell, 2010; Alessandri *et al.*, 2016). A primary difficulty with music performance assessment is managing its subjective nature. Rubrics can be used as a set of

guidelines to objectively assess a student's performance (Wesolowski, 2012). A rubric is a coherent set of criteria that includes descriptions of levels of performance quality across a range of dimensions. An analytical rubric specifies expectations for a given task by dividing it into its parts and providing a detailed description (Stevens, & Levi, 2005). Rubrics for piano performance might include criteria such as rhythmic accuracy, pitch accuracy, tempo, accent, dynamics, tone quality, interpretation, and overall quality (Duerksen, 1972), technical (tone, intonation, rhythmic accuracy, articulation, and technique) and musical (tempo, dynamics, timbre, interpretation and musical expression) (Russell, 2010), right-hand expression, phrasing, dynamics, rubato, form/structure, tone balance, pedaling, attention to rhythm and meter, articulation, technical competence, tempo, expression of several parts (Thompson *et al.*, 1998). Although the rubrics created for the performance contain different evaluation items, they can be grouped under three main headings: technical competence, musical interpretation, and stage presence. By using a rubric, teachers can provide more detailed feedback to students and help them identify areas for improvement (McMillan, & Hearn, 2008).

When assessing music performance, consistency is crucial, and using analytical rubrics increases inter-rater reliability. In order to test the reliability of an assessment tool, various statistical techniques can be applied based on various test theories. One of the primary assessment models is classical test theory (CTT). In CTT, reliability is defined in terms of internal consistency and stability (Urbina, 2004). The Cronbach's Alpha coefficient is typically used as the measure of internal consistency (Crocker, & Algina, 1986). The Cohen Kappa and interclass correlation techniques also provide information about inter-rater reliability (Gliner *et al.*, 2009; Howell, 2013).

The other testing construct is generalizability theory (GT). If more than one rater is used in assessing a student's musical performance, the variance of rater facet (variable) provides information about rater reliability. G and Phi coefficients also provide information about the reliability of the measurement process (Shavelson, & Webb, 1991). Thus, assessing piano performance using both classical test theory and generalizability theory might provide strong evidence for inter-rater reliability.

The standard grading measure is concerned with establishing a cut-off score that separates the competent from the incompetent student on a test or performance-based assessment (Ben-David, 2000). A cut-off score is simply the score that serves to delineate one level from another. If the cut-off scores are not appropriately set, the results of the assessment could come into question. For that reason, standard setting is a critical component of the test development process (Bejar, 2008). It is vital to establish cut-off scores for music performance assessments.

There are various approaches to setting standards for both written and performance-based assessment (Southgate *et al.*, 2001). A large number of methods have been developed and are used to set standards for both written and performance-based examinations (Cizek, & Bunch, 2007). Playing the piano is also a musical performance that can be measured; therefore, it is treated as a standard setting subject.

Among these methodological frameworks, Angoff is a commonly used method for standard-setting which requires expert raters. This approach is based on the concept of the borderline or minimally competent student. In other words, it is based on the determination of the student who performs the minimum acceptable playing performance according to the scoring made by two or more experts. The extended Angoff method is a parallel approach for

polytomously-scored items (Cizek, & Bunch, 2007). Extended Angoff is one of the most appropriate methods to define a cut-off score for piano performance scale for elementary and preschool teachers.

In literature there are some studies focusing on inter-rater reliability of musical performance tests (Boyle, & Radocy, 1987; Thompson *et al.*, 1998; Thompson, & Williamon, 2003). Also, Bergee (2003, 2007) used G Theory test inter-rater reliability of musical performance. Wrigley and Emmerson (2011) used the structural equation model in the reliability study of the performance rubric they developed for all musical instruments.

In evaluating the student's performance, jury points were taken into consideration. Musical performance is multi-layered and complex. For that reason, evaluation is often forced into a personal and emotional nature. It has been recognized that examiners who rated the same performance may hold different constructs, can weigh the same constructs differently, or may not hold any conscious constructs but rely on intuition or a gut feeling and, as a result, have difficulty articulating how they arrive at a performance rating (Boyle, & Radocy, 1987; Thompson *et al.*, 1998). Being an expert to evaluate is also an important issue as poor inter-rater consistency has resulted when raters who are novices in scoring the assessment define a given construct differently from those more familiar with the tool (Thompson, & Williamon, 2003). Moreover, there is some research investigating the severity of raters and rater presicion using Many-Facet Rasch Partial Credit Measurement Model (Wesolowski, 2012, Wesolowski *et al.*, 2015, 2016).

The passing grade may vary from institution to institution, but in most cases, it is between 60 and 70 out of 100. Can a teacher, playing at the 60-point level, convey the musical piece to the students? Which point level is good enough to convey the music to the students? In other words, what should be the rubric score equivalent of the minimum listenability level of a piano performance? To examine this, data were collected through a rubric that measures the dimensions of rhythm, melody, harmony, technique and tempo. The main purpose of this study is to determine the passing grade in the assessment made with a rubric with 5 criteria, each of which is scored between 1 and 5.

In the relevant literature, no studies were found that focus on developing a piano performance scale for elementary and pre-service teachers – notwithstanding that this would be a quite useful evaluative measure for use in elementary and preschool music courses. Creating such an instrument and testing its psychometric properties (validity and reliability) will thus contribute to the literature. This scale can be used to assess the piano performance of pre-service teachers on educational faculties.

Moreover, it has been seen that many factors impact rubric scores, having largely to do with issues of validity and reliability. The use and comparison of various statistical tools is considered important in measuring inter-rater reliability. Using both classical test theory and generalizability theory together will help researchers to assess validity and reliability problems more effectively. However, in the literature, there are very few studies using a combination of these approaches to test inter-rater reliability. This is why different methods based on CTT and G Theory were used together in this research. Besides, in the literature, there is no research aimed at defining cut-off scores for piano performance for preschool and elementary school prospective teachers.

The present study adds a statistical perspective on previous research in the field by examining the psychometric features and also includes the standard-setting study for the Piano

Performance Test for Pre-Service Teachers (PPT-PT). In this manner, it presents a valid and reliable way of assessing piano performance using rubrics.

The current study is aimed at investigating the psychometric properties and defining the cut-off score of the PPT-PT based on different measurement theories. The pertinent research questions are:

1. What is the construct validity of the PPT-PT? (Does PPT-PT effectively measure its intended construct?)
2. What is the reliability of the PPT-PT based on the CTT and GT? (What degree of error is involved in PPT-PT scores in the context of CTT and GT?)
3. What is the inter-rater reliability based on the CTT and GT? (What is the level of agreement among the independent raters scoring the PPT-PT?)
4. What is the cut-off score of the PPT-PT based on the extended Angoff method? (What is the minimum score that students should get to be successful in PPT-PT? According to the Extended Angoff method?)

2. Method

2.1. Design

This descriptive research aims to investigate the psychometric properties of an evaluative instrument, the PPT-PT. The current study also aims to define a cut-off score for PPT-PT. In educational research, researchers summarize the characteristics of individuals, groups, measurement tools, etc. with no intervention in the process (Fraenkel *et al.*, 2015); thus, in this study, the psychometric features and standards of the PPT-PT were described without any intervention.

2.2. Participants

The study participants consisted of three groups: students, raters used to test the psychometric features of the PPT-PT, and experts for the standard-setting study of the test.

Table 1. Demographic properties of the participant subjects

Participants	N	Grade
Elementary education program	50	Second
Pre-school education program	50	Third
Total	100	

Study Group 1 was comprised of 100 undergraduate students enrolled in the Preschool and Elementary Education Departments of a state university in Ankara. The participants were selected using convenience sampling. For practical reasons, it was not possible to use random sampling.

Study Group 2 consisted of two independent raters instructing music-education courses employed in different state universities in Ankara. One of the raters is a professor in the music-education field and has been instructing various undergraduate and graduate courses, including music theory, music-education, and music sociology, for 19 years. The other rater is an associate

professor in music-education and has been instructing individual and group violin undergraduate and graduate courses for 12 years. Both raters are also experienced in scoring musical instrument performances using various evaluative rubrics.

Group 3 comprised six experts from the field of music-education and performance, who were asked to estimate borderline examinee performance for each of the criteria in the PPT-PT (Cizek, & Bunch, 2007).

2.3. Instruments

For this study, the researchers developed a piano performance test and analytical rubric. The performance test required the students to play tunes on the piano. The piano piece included in this research was taken from the popular tunes taught in music courses in elementary schools.

The piano piece was in 4/4 meter and 32 measures. It was composed in the scale of D minor using six consecutive notes between C and A. The left-hand part included tonic and dominant chords in the main and first conversion positions. To assess students' performance, the raters used a rubric based on five criteria (tempo, rhythm, melody, harmony, and technique), with each criterion scored out of 5 points total. The piano performance analytical rubric (Appendix A) was developed considering the steps displayed in Table 2 (Andrade 2000; Haladyna, 1997; Kutlu *et al.*, 2014; Moskal, 2000).

Table 2. Rubric development process

Steps	Procedure
1	Defining the features/sub-dimensions to be assessed
2	Defining the range of scores for each sub-dimension
3	Defining the performance indicators
4	Forming the draft form of an analytical rubric
5	Taking expert opionion
6	Forming the final draft of the analytical rubric

The standard-setting expert form, developed by the researchers, consists of two parts and is administered, correspondingly, in two rounds. In the first round, the experts rate the borderline examinee performance independently for each of the five criteria. Then the experts revealed their estimates of the borderline examinee performance and discussed any inter-rater disagreement. In the second round, the experts rate the borderline examinee performance regarding the previous discussion and fill out the second part of the form (Appendix B).

2.4. Collection of data

For the data collection, the students performed the piano piece and each rater scored the students' performances independently. Since all students performed the same musical piece and each rater scored each student's performance, a fully crossed design was achieved (PxIxR). GT also allows for nested designs, in which different groups of raters graded different groups of students (Brennan, 2001). But in this study, a fully crossed design was used, with every student in the study evaluated by the same set of raters. The data structure example of the fully crossed design is presented in Table 3.

Table 3. Example of the data structure for a fully crossed design

	Item 1		**Item 2**		**. . .**	**Item 5**	
	R1	**R2**	**R1**	**R2**		**R1**	**R2**
P1	X	X	X	X	. . .	X	X
P2	X	X	X	X	. . .	X	X
.	.	.	.	.	. . .	.	.
.	.	.	.	.	. . .	.	.
P100	X	X	X	X	. . .	X	X

R: Rater, P: Person.

Each rater scored the students' performance individually and independently. This process took approximately ten minutes for each student and was completed in ten days.

The data collection of the standard-setting study was completed in the following five stages. In Stage 1, the experts were instructed as to what the standard-setting comprised and explained the extended Angoff method used in the study. In Stage 2, the experts discussed the competencies of borderline students concerning their musical performance. In Stage 3, the experts defined the borderline examinee performance for each criterion in the PPT-PT individually using the 'standard-setting' expert form. In Stage 4, the experts revealed their estimates of the borderline examinee performance and discussed any inter-rater disagreement. In the final stage, the experts redefined the borderline examinee performance for each of the criteria (considering what they had discussed in the previous section). Data collection for the standard-setting study session was completed in approximately 2 hours. Approval was obtained from the Ethics Committee of the Ankara University (ID: 85434274-050.04.03/2022).

2.5. Data analysis

Analysis for Validity. To define the construct validity of the Scale, exploratory and confirmatory factor analyses were calculated. In order to define item discrimination, the Mann-Whitney U test was conducted to compare the upper and lower 27% of participants.

Analysis for Reliability. To test inter-reliability, the Cronbach's Alpha coefficient was calculated based on CTT. For testing inter-rater reliability, the Cohen Kappa and interclass correlation coefficients were utilized based on CTT.

The GT framework was also utilized in determining rater reliability; the rater variance components were examined. For the reliability analysis, the G and Phi coefficients were calculated based on the G theory. For data analysis, EduG 6.1, SPSS 21.0, and LISREL 7.0 software packages were used.

Data Analysis for Standard-setting. Following the extended Angoff method, the PPT-PT and descriptive statistics were computed for the data collected from the experts.

3. Results

3.1. Findings on construct validity

The construct validity of the scale was assessed applying exploratory and confirmatory factor analyses. For practical reasons, it was not possible to apply the analyses to two different groups of participants because the sample size was insufficient. This is why exploratory and confirmatory factor analyses were computed based on the same group; this may be considered a limitation of the study. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) comprise multivariable statistics and require some assumptions and sample sizes; however, for the data based on the students' performance (such as musical instrument performance), it was not practical to obtain large sample sizes. In the present study, the sample size was 100; considering the number of items in the performance test (five items), this seemed sufficient for EFA and CFA (Barret, & Kline, 1981).

Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was utilized; the KMO value was calculated as .83. According to Leech et al. (2005), a KMO value of .80–.90 and higher can be interpreted as very good. Bartlett's test verifies whether our correlation matrix is different from the unit matrix. Therefore, a statistically significant Bartlett's test (rejection of the H_0 hypothesis) means that the correlations between the variables differ from zero. In this study, the Bartlett's test was found to be statistically significant ($p < .05$). Both KMO and Bartlet's sphericity test results show that the data are suitable for factor analysis calculation. Thus, the data set is suitable for factorization. In other words, it can be stated that the criteria in the rubric (rhythm, tempo, melody, harmony, technique) have a sufficient level of correlation with each other to form a factor. In the current study, there was no missing value in the research data.

The results of EFA indicated that the scale had a one-factor structure. In total, five items explained 63% of the total variance. To decide on the number of factors, the scree plot and Horn's parallel analysis were examined. Both showed that a one-factor structure was appropriate for the PPT-PT (Figure 1).

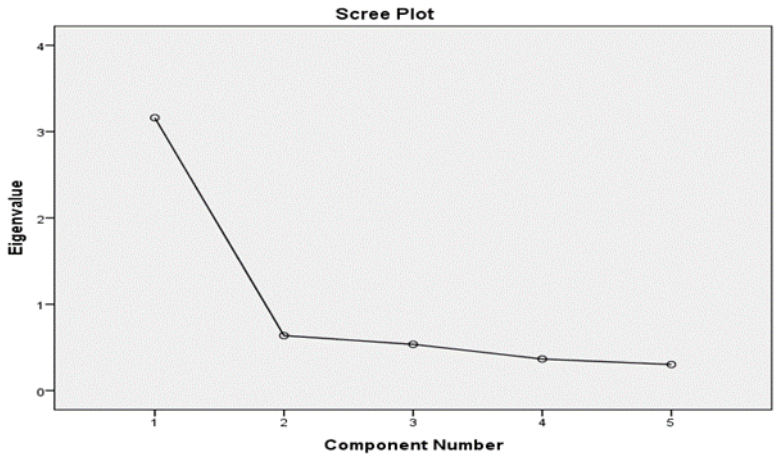

Figure 1. *Scree Plot for the PPT-PT*

The fact that there is a sharp decline in the graph after the first eigenvalue and that it flattens out and loses its slope indicates that a one-factor structure is dominant. In other words, the decline and flattening of the graph indicates that the criteria (tempo, rhythm, melody,

harmony, technique) in the rubric are components of a single construct. The factor loadings for the items of the PPT-PT were presented in Table 4.

Table 4. Factor loadings for the PPT-PT

Criteria	***Loadings***
	Factor 1
Tempo	.845
Melodic accuracy	.820
Rhythmic accuracy	.788
Harmonic accuracy	.779
Fingering	.739

As shown in Table 4, all factor loadings were between .74 and .85. This shows that all items had a strong relationship with the measured construct. Therefore, there was no need to omit any of the items since, according to Tabachnick and Fidell (2007), factor loadings above .40 are good enough to keep the items in the scale.

The CFA was utilized to confirm the one-factor structure of PPT-PT. Figure 2 shows the standardized coefficients from the latent variable to the observed variables and t values.

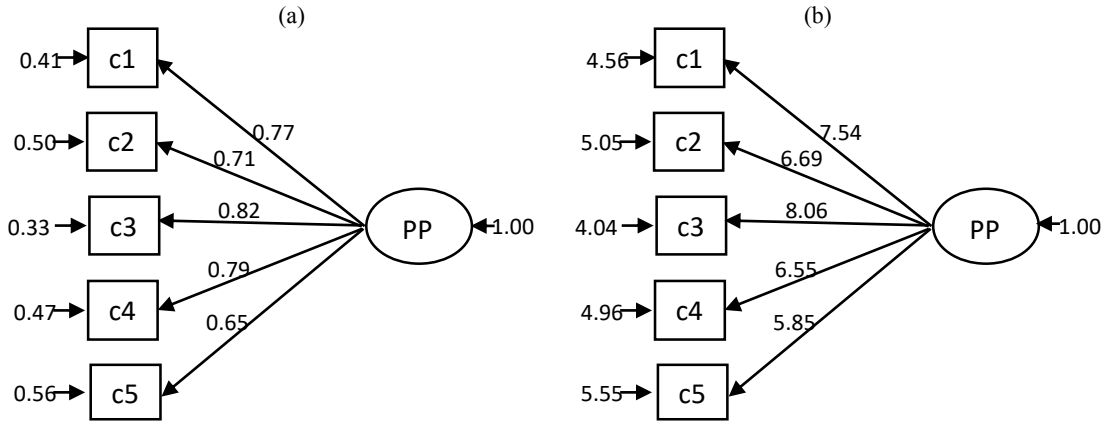

Figure 2. Standardized coefficients and t values for the relationship between the latent and observed variables

As shown in Figure 2(a), the standardized coefficients for the relationship between the latent and observed variables were between .65 and .82, respectively. Figure 2(b) shows that the t values for the relationship between latent and observed variables were above the critical ratio (2.58) and were statistically significant at the .01 level (the cut-off points for the fit indices are presented in Table 5).

Table 5. Cut-Off points for the Fit Indices

Fit Indices	Cut-off Points
Chi cuadrado / df	Chi cuadrado /df ≤2.5 excellent fit; ≤5 mediocre fit
GFI-AGFI- CFI- NNFI	GFI-AGFI- CFI- NNFI ≥ 0.95 excellent fit; ≥0.90 good fit
SRMR-RMSEA	SRMR-RMSEA ≤0.05 excellent fit; ≤0.08 good fit; ≤0.010 poor fit

Nota. df: degrees of freedom, GFI: Goodness of fit index, AGFI: Adjusted goodness of fit index, CFI: Comparative fit index, NNFI: Non-normed fit index, SRMR: Standardized root mean square residual, RMSEA: Root mean square error of approximation (Tabachnick y Fidell, 2007).

The ratio of the degrees of freedom was calculated as 3.937/5 = 0.89. This result can be considered as an indicator of an excellent fit (Tabachnick, & Fidell, 2007). The results of the other fit indices were as follows: non-normed fit index (NNFI): .96; comparative fit index (CFI): .98; goodness of fit index (GFI): .95; root mean square error of approximation (RMSEA): .11; and standardized RMR: .04.

The NNFI, CFI, and GFI values, being above .95, were the indicators of an excellent fit (Hooper *et al.,* 2008; Sümer 2000). The RMSEA and standardized RMR values below .05 indicated an excellent fit. The GFI and AGFI values, on the other hand, suggested the presence of a mediocre fit (Brown, 2006; Tabachnick, & Fidell, 2007). In this study, all fit indices showed an excellent fit, except for the RMSEA value.

When the results were examined overall, it was seen that, although the RMSEA value was relatively high, the ratio of chi-square to the degrees of freedom and the NNFI, CFI, and standardized RMR values were at the expected level. Therefore, the one-factor structure that was determined as a result of EFA was validated by CFA and the construct validity of the scale was at the expected level.

Thus, EFA and CFA results are statistical evidence that the criteria in the rubric (tempo, rhythm, melody, harmony, technique) come together to form piano playing skills. As a result, the sum of the scores obtained from the criteria shows the piano playing skill level of the performer.

3.2. Findings on item discrimination

The discrimination levels of the scale items were calculated to investigate whether there was a significant difference between the scale scores and the factor scores of the upper and lower 27% of the participants. The upper 27% students refer to high performance group, and the lower 27% of the students refer to low performance group. Item discrimination was measured for the PPT-PT using the Mann-Whitney U test. The results of this test indicate that the upper group had higher mean rank scores for each item on the scale; this difference was significant at the .01 level. Moreover, item-total correlations were computed; it was found that all correlations suggested that the PPT-PT was capable of discriminating high and low performance groups.

3.3. Findings on internal consistency and generalizability studies

Cronbach's Alpha was utilized to determine the coefficient of the internal consistency of the PPT-PT and calculated as .83. The results indicated that the internal consistency of the scale was high.

Table 6. Variance component values for a fully crossed design

Source	SS	df	MS	Corrected	%
S	142.43288	72	1.97823	0.15049	29.5
I	49.46575	4	12.36644	0.06753	13.2
R	2.08356	1	2.08356	-0.00111	0.0
SI	91.33425	288	0.31713	0.08658	17.0
SR	21.61644	72	0.30023	0.03125	6.1
IR	9.33425	4	2.33356	0.02999	5.9
SIR	41.46575	288	0.14398	0.14398	28.2
Total	357.73288	729			100%

As shown in Table 6, the variance component for the student main effect (S object of measurement) was 0.15, which explained approximately 30% of the total variance. This showed that the PPT-PT was capable of defining individual differences among the students. Considering the main effect of the item, it was seen that the variance component was 0.07, explaining 13% of the total variance. This means that the difficulties of the items in the PPT-PT were diversified. Most importantly, the rater main effect was examined and revealed that the variance component was 0.0011, which explained almost none of the total variance. In other words, the amount of variance from the rater was very low in the total variance. This means that the raters were consistent with each other.

Concerning the interaction effects of the variance components, student-item (SI), student-rater (SR), and item-rater (IR) were 0.08 (17%), 0.03 (6.1%), and 0.02 (5.9%), respectively. The variance component of the interaction effect of student-item-rater (SIR) was 0.14, which was the second highest component. The results show that 28% of the total variance consisted of random errors. Moreover, the G coefficient, which referred to the relative error variance was .76. This value was sufficient, considering PPT-PT had a relatively small number of items (Diederich, 1973). Furthermore, decision studies showed that, if the number of raters increased to 3, 4, and 5, the G coefficients would become .80, .82 and .83, respectively. Therefore, it would be better to use at least three raters for the musical instrument performance scale to obtain higher G coefficients.

3.4. Findings on the inter-class correlation coefficient

This section shows an inter-class correlation coefficient (ICC), which indicates rater reliability for Raters 1 and 2. The ICC between the raters was found to be .593 ($F_{364\text{-}365} = 3.81$, $p < .01$), suggesting moderate inter-rater reliability. Based on the 95% confidence interval of the ICC estimate, the values less than .50, between .50 and .75, between .75 and .90, and greater than .90 are indicative of poor, moderate, good, and excellent reliability, respectively.

3.5. Findings on the standard-setting study

Table 7. Results of the standard setting study

Expert No:		C1	C2	C3	C4	C5	Mean of row	SD of the row
1	Round 1	5	5	5	5	5	5.00	0.00
	Round 2	5	4	4	3	5	4.20	0.84
2	Round 1	4	5	4	4	4	4.20	0.45
	Round 2	4	5	4	4	4	4.20	0.45
3	Round 1	4	4	4	4	4	4.00	0.00
	Round 2	4	4	4	3	4	3.80	0.45
4	Round 1	5	4	4	3	3	3.80	0.84
	Round 2	4	4	4	3	3	3.60	0.55
5	Round 1	4	4	5	3	3	3.80	0.84
	Round 2	4	4	5	3	3	3.80	0.84
6	Round 1	4	5	5	5	3	4.40	0.89
	Round 2	4	5	5	5	3	4.40	0.89
7	Round 1	5	5	5	4	3	4.40	0.89
	Round 2	4	5	5	3	3	4.00	1.00
8	Round 1	4	4	5	4	3	4.00	0.71
	Round 2	4	4	5	4	3	4.00	0.71
9	Round 1	4	4	4	3	2	3.40	0.89
	Round 2	4	3	4	3	2	3.20	0.84
	Mean of column 1	4.33	4.44	4.55	3.89	3.33	4.11	
	Mean of column 2	4.33	4.22	4.44	3.44	3.33	3.95	
	SD of column 1	0.5	0.53	0.53	0.78	0.87	0.64	
	SD of column 2	0.33	0.66	0.53	0.73	0.87	0.62	

C: Criteria
SD: Standard Deviation

As shown in Table 7, when the cut-off scores for each item at the end of the second round were examined, it was seen that the experts allocated the lowest cut-off point to Item 5 (3.33) and the highest cut-off point to Item 3 (4.44). Also, the experts stated that the students at the borderline should have an average of 3.95 points from each item. The standard deviation values were examined to determine the variability between the experts' scores; it was therefore concluded that the variability between the expert opinions was less in Round 2 (0.62) than in Round 1 (0.64).

To compute the cut-off score, the mean of the total points of each expert for each item was taken. Then, the means were summed to obtain the cut-off score: 4.33+4.22+4.44+3.44+3.33 = 19.75

According to the findings obtained from the experts (using the extended Angoff method), for a student to be considered sufficient in their performance, they must obtain at least 19.75 out of 25 from the PPT-PT. Since it is not possible to obtain decimal scores from this scale, the cut-off score was rounded to 20.

4. Discussion and conclusions

This study aimed to investigate the psychometric properties and define the cut-off score of PPT-PT using different methods. The results of the EFA and CFA analyses showed that the PPT-PT had a one-factor structure, which means that the scale measured one latent trait, i.e., musical instrument performance (indicating sufficient construct validity). Therefore, we can state that the Scale purely measured piano performance without involving other traits. Thus, with this scale, students' musical abilities can be evaluated fairly.

Cronbach's Alpha coefficient result indicates that the internal consistency of the scale was high. In other words, the items/criteria were inter-correlated, and it was appropriate to sum the scores from different items/criteria. This study employs an analytical rubric to assess students' musical performances, which involves evaluating specific sub-behaviors, including tempo, melodic accuracy, rhythmic accuracy, harmonic precision, and fingering. When both EFA CFA results and Cronbach's Alpha value are evaluated together, it can be interpreted that these theoretically predicted sub-behaviors come together in a consistent manner and constitute musical performance. In other words, this assumption in the literature has been confirmed in a sense.

The results of the item discrimination analysis revealed that the PPT-PT was good at discriminating students who had high and low levels of ability to play a musical instrument. This demonstrates a strong correlation between the expressions delineated for the sub-components of musical performance and their direct relevance to the art of musical performance itself. Consequently, employing this rubric can facilitate the assessment of students' piano performances using repertoire akin to the examples provided herein.

The findings of the generalizability studies showed that the test was capable of defining individual differences among the students. Furthermore, the amount of variance from the raters was very low in total, meaning that the raters were consistent. In other words, there was an agreement among the raters when they independently scored the students' performances. However, the random error variance, which showed the amount of error that interfered with the measurement process, was relatively high. This means that some other variables (e.g., time, type of rubric, etc.) should be considered when undertaking generalizability analyses in further studies. Furthermore, the G coefficient indicated an acceptable reliability level for the investigated test, which is also consistent with the Cronbach's Alpha coefficient. However, the decision studies utilized indicated that, in order to increase reliability, it was better to use three raters. In this study, we had two raters. It is therefore recommended for future instructors or researchers applying the PPT-PT to utilize at least three raters to obtain more reliable results.

The findings related to the ICC indicated moderate inter-rater reliability. The level of inter-rater reliability was relatively acceptable. On the other hand, similar to the results of the decision study, it was considered to be better to use three raters than two. When assessing both generalizability and intraclass correlation coefficient analyses together, it becomes evident that the explanations provided for the sub-behaviors in piano performance were consistently understood by various raters. Consequently, this suggests a high level of accuracy in introducing and defining the criteria (sub-behaviors) during the development of the scoring key.

The results of the standard-setting study suggested that the cut-off score of the PPT-PT was relatively high. This shows the importance of the piano performance being assessed as a whole. For example, if a student plays the rhythm, notes, chords, tempo, etc., partly accurately, they can achieve a score of 13 of 25 (52%) from this scale. Thus, a student who receives a score of 13 out of 25 (52%) can be considered successful. However, in this case, the performed piece would nonetheless be incomprehensible to the audience. Moreover, in this study, the participants were teacher candidates, who are expected to teach these pieces to their students. Therefore, a score of at least 20 of 25 points (80%) on the PPT-PT was required in order to pass the examination.

This study shows that the PPT-PT is valid and reliable and can be used to assess undergraduate students' piano performances with a cut-off score of 20 of 25 (80%). Therefore, it

is advised that instructors use this Scale to assess students' performance. However, it is highly recommended that a minimum of 20 be used as a cut-off score. Moreover, instructors will obtain more reliable results if they use at least three raters. Nevertheless, it should not be forgotten that the raters must be experienced and well-qualified. Otherwise, the reliability of the scale may decrease (Kamış, & Doğan, 2018).

Future researchers can repeat similar studies with more samples and raters. Additionally, they can use other techniques for standard-setting analyses, such as Bookmark, Nedelsky, etc. (Cizek, & Bunch, 2007). Moreover, if the researchers have a larger sample (more than 250 participants), it is advised using the many-faceted Rasch model to test the validity and reliability of the PPT-PT or other developed scales.

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APPENDIX A - Piano Performance Test for Pre-Service Teachers

Analytical rubric

Student's name: **Department:** **..../..../ 20**

	5 Points	4 Points	3 Points	2 Points	1 Point
Tempo	**Tempo is considered and even** *Played at the right tempo from beginning to end.*	**Tempo is even** *Played at the right pace, with a few hesitations.*	**Tempo is mostly even** *Paused while playing or hesitated a lot*	**Tempo is mostly erratic and uneven** *Paused many times while playing or Tempo was unstable due to hesitation.*	**Couldn't complete the piece.**
Rhythmic Accuracy	**The rhythm is coherent and makes musical sense** *Played the rhythms completely right*	**The rhythm is mostly coherent and makes musical sense** *Made minor rhythmic mistakes in one or two measures (less than 10%) during the performance*	**The rhythm is often coherent and makes little musical sense** *Made three to six minor mistakes (11% to 30%) or stopped once during the performance*	**The rhythm is incoherent and does not make musical sense.** *Made seven to ten minor rhythmic mistakes* (31% to 50%) *or stopped several times (more than twice) during the performance.*	**The rhythm was almost imperceptible**
Melodic Accuracy	**The melody feels complete and coherent; the piece makes musical sense** *Played the melody completely right*	**The melody feels less complete and coherent; the piece makes less musical sense** *Played one or two incorrect notes (less than 10%) during the performance.*	**The melody feels musically incomplete** *Played three-five incorrect notes (11% to 30%) during the performance.*	**The melody is not complete or coherent** Played six to ten *incorrect notes* (31% to 50%) *during the performance.*	**The melody was almost imperceptible**
Harmonic Accuracy	**Chords are evident and musically played** *Played all the chords completely right*	**Chords are used in a manner that supports the piece musically** *Played one or two incorrect chords (less than 10%) or incorrect voices in chords.*	**The chords do not always align with the melody** *Played three to five incorrect chord (11% to 30%) or incorrect voices in chords.*	**Chords are used, but do not align appropriately with melody** *Played six to ten incorrect chords (31% to 50) or incorrect voices in chords.*	**The chords were almost imperceptible**
Fingering	**All fingering was played correctly** *Played the whole piece with the right fingering.*	**Almost all fingering was played correctly** *Played with one or two incorrect fingering (less than 10%) during the performance*	**Some of the fingering was correct, but the overall impression was inconsistent** *Played with three to five incorrect fingering (11% to 30%) during the performance*	**Fingering was not followed** Played with six to ten incorrect fingering *(31% to 50%)* during the performance	**Demonstrated a lack of understanding of appropriate fingering**

If necessary, the rater can fill out this part.

Extraordinary performance that cannot be assessed via the PPT-PT:

Weaknessess of the student that cannot be assessed via the PPT-PT:

APPENDIX B- Extended Angoff Method Expert Opinion Form

Expert ID : _____

ROUND 1

Rate the borderline examinee performance from 1 to 5 points for each criteria given below

CRITERIA	**Tempo (Criteria 1)**	**Ryhtmic Accuracy (Criteria 2)**	**Melodic Accuracy (Criteria 3)**	**Harmonic Accuracy (Criteria 4)**	**Fingering (Criteria 5)**
SCORES					

Reveal your estimates of the borderline examinee performance and discuss any inter-rater disagreement.

ROUND 2

Rate the borderline examinee performance from 1 to 5 points regarding the previous discussion for each criteria given below

CRITERIA	**Tempo (Criteria 1)**	**Ryhtmic Accuracy (Criteria 2)**	**Melodic Accuracy (Criteria 3)**	**Harmonic Accuracy (Criteria 4)**	**Fingering (Criteria 5)**
SCORES					

1st and 2nd Round Descriptive Statistics (This part will be filled out by the researcher)

	Minimum Score		Maximum Score		Mod		Median		Mean	
	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2
Criteria 1										
Criteria 2										
Criteria 3										
Criteria 4										
Criteria 5										

R1: Round 1 R2: Round 2

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ARTICLES

"I'll be a kindergarten teacher and I don't sing well, but it doesn't matter". Analysis of self-concept and use of the singing voice in Early Childhood Education degree students

"Seré maestra de Infantil y no canto bien, pero no importa". Análisis del autoconcepto y uso de la voz cantada en estudiantes del grado de Educación Infantil

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Abstract

Singing in the classroom is important for children's development and for this to happen teachers must be competent in this activity. This transversal study analyses the use of the singing voice, vocal and emotional self-concept in relation to the context and vocal health of future early childhood education teachers (0-6 years) at three universities. For this purpose, a questionnaire was administered to 240 students (22-45 years; 200 females; 40 males). The results show that only about 30% of the students believe they have a beautiful voice, find it easy to sing in the written pitch and sing in tune and effortlessly. However, those who have a family context where singing is present, not only does their self-concept improve, but also understand that for a teacher it is necessary to sing and sing well, because, among other things, they will be a vocal role model for their students. Although the students perceive themselves to be in good vocal health, this is not what they observe in their internship tutors-mentors, who often use recorded music and present voice alterations. It is concluded that the Early Childhood Education degrees fail to provide enough resources to their students to improve their vocal competence and self-concept.

Key words: Self-concept; Singing; Initial Training; Voice Health.

Resumen

Cantar en el aula es importante para el desarrollo de niños y niñas y para que esto suceda el profesorado debe ser competente en dicha actividad. En este estudio transversal, se analiza el uso de la voz cantada, el autoconcepto vocal y emocional con relación al contexto y la salud vocal del futuro profesorado de Educación Infantil (0-6 años) de tres universidades. Para ello, se ha pasado un cuestionario a 240 estudiantes (22-45 años; 200 mujeres; 40 hombres). Los resultados muestran que sólo en torno al 30% del alumnado cree que tiene una voz bonita, les es fácil cantar en el tono escrito y cantan afinado y sin esfuerzo. Aunque en aquellas personas que tienen un contexto familiar donde el cantar está presente no solo el autoconcepto mejora, sino que comprenden que para el profesorado es necesario cantar y hacerlo bien porque, entre otras cosas, serán un modelo vocal para sus estudiantes. El alumnado percibe tener buena salud vocal, no es lo que observan en sus tutoras-mentoras de prácticas, quienes a menudo usan música grabada y presentan alteraciones de la voz. Se concluye que los grados de maestro/a en Educación Infantil no consiguen dar suficientes recursos a sus estudiantes para mejorar su competencia y autoconcepto vocal.

Palabras claves: Autoconcepto; canto; formación inicial; salud vocal.

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1. Introduction

Singing is an essential part of childhood and growth (Welch, 2001). In early childhood settings, singing plays a vital role, not only in the development of musical skills but also in the development of physical, social, and language skills (Lorenzo, *et al*., 2014). Singing enhances listening skills, aids in auditory memory, builds self-confidence, teaches performance skills, and facilitates group building. Furthermore, singing also contributes to the psychological and emotional development of the child (Pascale, 2005). For these reasons, it is important for both boys and girls to have ample opportunities to engage in singing.

School is a significant part of children's lives. Therefore, for singing to become a part of their daily routine, early childhood education teachers should perceive singing as a normal and easy activity. However, in many cases, this is not the reality. Lack of confidence, musical/vocal self-concept, past experiences, or vocal problems can be the reasons why such an important activity for child development is either omitted or avoided within early childhood education classrooms. From an educational standpoint, it is also crucial to equip prospective early childhood educators with the necessary tools to effectively incorporate vocal activities in their classrooms for children aged 0-6.

The aim of this research is to describe the use of the singing voice and vocal health of future early childhood education teachers during their initial training. Therefore, the following specific objectives are proposed: (i) to explore the students' self-concept regarding their vocal and musical abilities and their emotional perception of singing; (ii) to understand their self-perception of vocal health; (iii) to analyze the influence of family, school, and social context on emotional perception while singing and vocal abilities; (iv) to compare potential differences between first and fourth-year students; (v) to know fourth-year students' opinions on the use of the singing voice performed by the internship teachers in the classroom.

1.1. Singing Voice in Teachers and Vocal Competence: A Matter of Confidence?

The provision of music in many preschools and daycares often still consists of simply playing a CD for children to dance and sing along (Bainger, 2010). However, to make music and singing an important part of daily classroom work, teachers who have confidence in their own competence are required (Ehrlin, & Wallerstedt, 2014). A study conducted with New Zealand preschool education trainees shows that a significant number of them feel unprepared, consider themselves not very musical, and have negative feelings toward singing (Swain, & Bodkin-Allen, 2014). As a result, these beliefs and self-limitations lead to teachers who rarely sing with their students (Pascale, 2005).

Confidence plays a fundamental role, and when it is lacking, avoidance behaviors toward that skill or activity are often carried out (Heyning, 2011). It has long been known that generalist primary and preschool teachers face difficulties with musical practice in the classroom due, among other factors, to lack of confidence and singing abilities (Swain & Bodkin-Allen, 2017), negative feelings towards singing (Swain, & Bodkin-Allen, 2014) or towards their own voice (Lee Nardo, *et al*., 2006), or uncertainty about vocal performance in the classroom (Ehrlin, & Tivenius, 2018). Confidence has been studied by authors like Heyning (2011) and Ehrlin and Wallerstedt (2014), who conclude that there is a close relationship between confidence and self-efficacy.

Another observed element is that people who refer to themselves as "non-singers" express anxiety towards singing and often resist situations in which they have to sing (Abril, 2007). This singing anxiety seems to arise in a social context where participants are concerned about the possibility of being personally evaluated by others; this phenomenon is rooted in past negative experiences, where music teachers and family members seemed to have the greatest influence on shaping their beliefs about singing ability and the identity of a singer (Abril, 2007). A common narrative is that this unpleasant experience would affect the perception of vocal ability and confidence in performance (Swain, & Bodkin-Allen, 2017). Criticism of the singing voice is often interpreted by the recipient as a personal attack because the voice is directly linked to one's self (Bodkin-Allen, 2009). Once criticized, individuals may alter their singing behaviors, leading to what West (Swain, & Bodkin-Allen, 2014) calls selective mutism for singing. In this case, an individual's singing ability remains intact, but is not used in specific circumstances for psychosocial reasons.

A common denominator among teachers is that they attribute their lack of music competence mainly to the limited amount of time dedicated to music in their undergraduate teacher training courses (Temmerman, 2006). On the other hand, research with teachers who sang in the classroom, conducted by Pascale (2013), showed that even without formal music training, all of them recalled positive musical experiences from their childhood: their mothers always sang to them, their family sang in the car, and they had attended symphony concerts.

1.2. Musical Self-concept

Self-concept plays a fundamental role in the formation of personality, directly influencing, among other aspects, how people learn and behave towards others, their thoughts, and their feelings (Clark, 2000). Furthermore, it is linked to a proper satisfaction of the individual with themselves and their surroundings (Esnaola, *et al*., 2008). It is, therefore, a psychologically significant variable in the educational context, as it affects both academic performance and the emotions of individuals (Zubeldía, *et al*., 2018).

The self-concept model, as a multidimensional and hierarchical construct proposed by Shavelson *et al.* (1976), has been universally recognized by the scientific community, although there is currently no consensus on the diversity of its component factors and the nature of their interrelation. Consequently, different classifications and models of self-concept can be found, with the following domains being predominantly accepted among researchers: (i) academic self-concept, (ii) social self-concept, (iii) emotional self-concept, (iv) physical self-concept (González, 2005).

Ruismäki and Tereska (2006) propose a musical self-concept model composed of 6 factors: (1) the general idea of one's musical abilities, (2) musical taste, (3) mastery of musical instruments, (4) activities related to music direction, (5) singing, and (6) musical listening. These same authors demonstrated the influence of early musical experiences in adulthood, both from the perspective of acquired musical training and the development of musical self-concept. For this study, we refer to the factors in this model related to musical abilities, instrument mastery –in this case, voice– and singing.

Additionally, for Austin (1990), students' self-concept as music learners has a decisive influence on their behavior in the classroom and their motivation to participate in musical activities. Therefore, music education research provides evidence that positive self-concept is

often associated with strong musical performance (Austin 1988). Likewise, it is possible to consider that a negative self-concept in music often originates in negative early childhood experiences (McLendon, 1982).

1.3. Voice Health

Teaching is a high-risk profession for the development of voice problems (Behlau, *et al*., 2012; De Alvear, *et al.*, 2011). Various studies highlight that more than half of the teachers report voice problems during their careers (De Jong, *et al*., 2006; Roy, *et al.*, 2004). Furthermore, teachers who have experienced voice problems during their training report more work absences due to voice issues than colleagues without voice problems during their training. Teachers with voice problems have a significantly higher risk of speaking much louder in the classroom, experiencing physical discomfort due to the effort, reducing the course content of their teaching, changing their job satisfaction, and being emotionally affected (Chen, *et al*., 2010).

The same holds true for Education students as for active teachers: they report a greater number of vocal symptoms and more frequently than other university students (Simberg, 2004). It has also been observed that, during their teacher training, some students begin to experience voice problems. Ohlsson (2016) found that 14% of students who started their studies without voice problems ended their studies with dysphonia. She also noted that those students who received vocal training during their studies improved their vocal capacity, indicating that vocal education in teacher training is essential.

2. Method

2.1. Design

This is a post-hoc statistical study based on a questionnaire. The methodology used is quantitative, and it employs the questionnaire as a data collection technique.

2.2. Sample

The sample consists of 224 students, aged between 18 and 23, from the Bachelor's degree program in Early Childhood Education (ages 0 to 6) at three universities: Universidad Autónoma de Barcelona, Universidad Pública de Navarra, and Universidad Ramon Llull. A total of 120 first-year students (111 females and 9 males), and 104 fourth-year students (99 females and 5 males) participated. The sample was formed using the convenience sampling technique.

2.3. Instrument

To assess students' perception regarding singing and its use in the classroom, a questionnaire (PUVCA) was constructed based on the review and adaptation of the following scales: the *Self-Concept in Music Scale* (SCIM) (Svengalis, 1978); the *Self-Esteem of Music Ability Scale* (SEMA) (Schmitt, 1979); the *Musical Self-Concept Questionnaire* (CAMU) by Zubeldía (2014); the *Evaluation of Ability to Sing Easily* (EASE) in its adaptation to Chilean

Spanish (Correa, *et al.*, 2020); and the *National Singing Programme Sing Up Questionnaire* (Welch, *et al.*, 2014). The instrument was validated by a panel of 6 expert judges, all of whom are teachers of Music Didactics in the Early Childhood Education degree programs at the following universities: Universidad Autónoma de Barcelona (the coordinator of the Early Childhood Education degree program and two Associate Professors with over 20 years of experience as Music teachers in Primary School and in the Early Childhood Education degree), Universidad Pública de Navarra (an Associate Professor with over 20 years of experience in as a Music teacher in Primary School and in the Early Childhood Education degree), and Universidad Ramon Llull (two professors in the Speech Therapy degree, experts in voice, one with over 20 years of experience and the other with more than 10 years).

To assess participants' vocal health perception, the *Voice Handicap Index* (VHI) by Jacobson (1997) was used, specifically the Spanish 10-item version: VHI10 (García-López, 2010).

Based on their feedback, the final version of the instrument was revised, consisting of 20 ordinal scale questions organized into categories: a) family, school, and social context (6 questions), b) emotional perception while singing (3 questions), c) self-concept regarding vocal and musical abilities (9 questions), d) the role of singing in the teaching profession (1 question), and e) belief that everyone can sing (1 question). The Cronbach's Alpha analysis yielded a score of 0.827 for 20 items, confirming the internal consistency of the questionnaire. Additionally, the self-perceived vocal health questionnaire (VHI10) was included. Furthermore, a section with 6 questions was added specifically for fourth-year students to gather their opinions on their vocal and musical learning during the degree and their perception of the use of voice by early childhood teachers during internships.

The questionnaire items are answered on a four-point ordinal scale, where 1 means *Strongly Disagree* and 4 means *Strongly Agree*. Participants are given this information to help them place their perception between these two extremes. An even number on the scale was used to avoid a "Neither Agree nor Disagree" response, and specifically, a four-point scale was used to maintain consistency with the other questionnaire they had to respond to (the *Voice Handicap Index* - VHI10 - which is a 5-point scale).

2.4. Procedure

The questionnaire was administered in digital format and distributed through the Intranet of each participating university. All participants in the research were informed in advance about the confidential treatment of the collected information and the research's purpose, and they were required to provide informed consent.

3. Results

3.1. Questionnaire results

Table 1 shows the response percentages for each of the groups (1st and 4th grade) and for the overall dataset.

Table 1. Percentage of responses to each question in the questionnaire

	1º				4º				all			
	Disagree		Agree		Disagree		Agree		Disagree		Agree	
Values	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Variables from the context category												
My family sings	10	43.3	27.5	19.2	16.3	24	28.8	30.8	12.9	34.4	28.1	24.6
We used to sing regularly at school	10.8	36.7	36.7	15.8	10.6	29.8	44.2	15.4	10.7	33,5	40.2	15.6
I sing with my friends	13.3	38.3	31.7	16.7	11.5	26.9	35.6	26	12.5	33	33.5	21
I sing when I'm alone	2.5	11.7	27.5	58.3	1	9.6	29.8	59.6	1.8	10.7	28.6	58.9
My mother/father taught me to sing	77.5	15.8	5.8	0.8	60.6	23.1	11.5	4.8	69.6	19.2	8.5	2.7
They tell me that I sing poorly	25.8	39.2	15.8	19.2	34.6	27.9	16.3	21.2	29.9	33.9	16.1	20.1
Emotional self-concept variables												
I feel good when singing	0.8	7.5	40	51.7	0	11.5	37.5	51	0.4	9.4	38.8	51.3
I feel confident when singing	22.5	33.3	26.7	17.5	18.3	26	28.8	26.9	20.5	29.9	27.7	21.9
I prefer singing in a group to singing alone	15	22.5	25	37.5	10.6	21.2	23.1	45.2	12.9	21.9	24.1	41.1
Variables of the self-concept on musical and vocal abilities category												
I have musical skills	31.7	37.5	26.7	4.2	27.9	29.8	32.7	9.6	29.9	33.9	29.5	6.7
I sing well	40	40	19.2	0.8	24	43.3	27.9	4.8	32.6	41.5	23.2	2.7
Singing comes easily to me	24.2	35.8	31.7	8.3	21.2	32.7	34.6	11.5	22.8	34.4	33	9.8
I have a beautiful voice	33.3	40.8	23.3	2.5	27.9	48.1	21.2	2.9	30.8	44.2	22.3	2.7
I am expressive when singing	5.8	42.5	35	6.7	12.5	36.5	32.7	18.3	14.3	39.7	33.9	12.1
I sing in tune	45	34.2	16.7	4.2	28.8	40.4	22.1	8.7	37.5	37.1	19.2	6.3
I sing without tension/effort	22.5	45	28.3	4.2	30.8	37.5	26.9	4.8	26.3	41.5	27.7	4.5
Singing in the written pitch comes easily to me	32.5	45.8	19.2	2.5	26.9	45.2	22.1	5.8	29.9	45.5	20.5	4.0
I find it easy to memorize songs	3.3	9.2	36.7	50.8	6,7	8.7	34.6	50	4.9	8.9	35.7	50.4
I will be a vocal role model for boys and girls	25	53.3	17.5	4.2	13.5	40.4	33.7	12.5	19.6	47.3	25	8
All people can sing	20	23.3	33.3	23.3	12.5	19.2	29.8	38.5	16.5	21.4	31.7	30.4

For the analysis of frequencies, positive and negative trends for each variable have been combined. In this case, the results primarily reflect that people tend to sing more when they are alone than when they are with friends, and 85.5% do so over recorded music.

Despite not feeling confident (50.4%), not finding it easy (57.2%), and experiencing vocal strain (67.8%), 90.1% of the students feel good when singing. A significant portion (63.8%) believe they lack musical skills and are unaware that they will be a vocal role model for their students. Moreover, over a third think that singing is a skill reserved for a privileged few.

When comparing the means of the 1st and 4th-grade groups, significant differences are found only in the item "I will be a vocal role model" ($p<.000$). We cannot attribute this result to education, as there are more fourth-grade students with singing family members (59.6%) compared to first-grade students (46.7%), and both variables are strongly correlated.

3.2. Self-perception of vocal health

The results indicate that 87.1% of the individuals who completed the questionnaire do not perceive any vocal problems (VHI =<9), 8.8% perceive a moderate vocal problem, and only 3.9% perceive a severe problem. There are no significant differences in the results between the 1st and 4th-grade groups.

3.3. Correlation among the different studied variables

The correlation study was conducted within the same category of variables (intra) and among variables from different categories (inter).

The initial analysis reveals that, for the most part, variables within the same category exhibit a significant correlation, although with low strength. Concerning contextual variables, "They tell me that I sing poorly" does not show a significant correlation. Those who do not sing when they are alone receive more criticism for their singing (r=-.286; p<.000). Regarding variables related to the perception of vocal abilities, "I find it easy to memorize" is the only one that does not have significant correlations with all the other variables studied. In the case of emotional perception variables, only "I feel confident when singing" correlates with the rest of the variables, taking into account that the variable "I prefer to sing in a group" is inversely correlated (r=-.358; p<.000).

In the analysis of correlations between variables from different categories, the data shows that the emotional perception variable "I feel good when singing" correlates very significantly with all the variables in the context category. Those whose 'family sings,' 'sing with their friends,' 'sing when they are alone,' and 'their parents taught them to sing' also feel secure when singing.

Table 2. Correlation between contextual variables and emotional perception variables when singing

Spearman's rho N=224	**My family sings**	**We used to sing regularly at school**	**I sing with my friends**	**I sing when I'm alone**	**My mother/father taught me to sing**	**They tell me that I sing poorly**
I feel good when singing	.327**	.259**	.371**	.378**	.288**	-.226**
I feel confident when singing	.21**	.061	.195**	.230**	.210**	-.222**
I prefer to sing in a group	.069	.150*	.075**	.042	.061	.025

** The correlation is significant at the 0.01 level (two-tailed)
* The correlation is significant at the 0.05 level (two-tailed)

The fact of singing at school is the one that correlates the least with the rest of the variables. On the contrary, having a family that sings and singing when alone are the items that have the greatest correlation with vocal and musical abilities. Furthermore, it is these people who perceive that all people can sing.

In the correlation of variables from the context categories and vocal abilities, again, those who are told that they sing poorly have no perception of: having musical abilities, singing well, singing in tune, singing without effort or singing with ease.

Table 3. Correlation between variables in the context category and vocal skills

Spearman's rho N=224	**My family sings**	**We used to sing regularly at school**	**I sing with my friends**	**I sing when I'm alone**	**My mother/father taught me to sing**	**They tell me that I sing poorly**
I have musical skills	.252**	.209**	.234**	.319**	.28**2	-.337**
I sing well	.338**	.146*	.216**	.254**	.324**	-.485**
Singing comes easily to me	.361**	.164*	.341**	.346**	.301**	-.290**
I have a beautiful voice	.302**	.184**	.154*	.249**	.299**	-.414**
I am expressive when singing	.253**	.169*	.160*	.277**	.182**	-.202**
I sing in tune	.293**	.176**	.256**	.273**	.336**	-.442**
I sing without tension/effort	.227**	.100	.222**	.232**	.181**	-.258**
Singing in the written pitch comes easily to me	.173**	.058	.171*	.186**	.199**	-.370**
I find it easy to memorize songs	.065	-.010	.216**	.257**	.075	-.058

** The correlation is significant at the 0.01 level (two-tailed)
* The correlation is significant at the 0.05 level (two-tailed)

The variables on emotional perception when singing "I feel good when singing" and "I feel safe when singing" correlate very significantly with all the variables of the self-concept category on vocal and musical abilities. On the other hand, the preference for singing in a group does not have any significant correlation with the self-concept variables of vocal abilities.

Table 4. Correlation between variables in the emotional perception while singing category and vocal skills

Spearman's rho N = 224	**I feel good when singing**	**I feel confident when singing**	**I prefer singing in a group**
I have musical skills	.306**	.205**	.109
I sing well	.343**	.337**	-.023
Singing comes easily to me	.469**	.370**	.013
I have a beautiful voice	.344**	.372**	-.028
I am expressive when singing	.391**	.358**	.034
I sing in tune	.367**	.348**	.043
I sing without tension/effort	.292**	.292**	-.012
Singing in the written pitch comes easily to me	.229**	.311**	.048
I find it easy to memorize songs	.234**	.115	.078

** The correlation is significant at the 0.01 level (two-tailed)
* The correlation is significant at the 0.05 level (two-tailed)

Focusing on the question related to "I will be a vocal model for children", we observe how it correlates with all the variables of the self-concept category on musical and vocal abilities and with the following variables of emotional perception when singing: "I feel good when singing"and "I feel safe when singing." Those who sing in their family and do not tell them that they sing badly are the ones who think that they are going to be a vocal model, they understand that "as they sing, the children will sing."

Regarding the item "All people can sing", those who feel good singing and who have vocal abilities consider that all people can sing. Regarding the context category, it is also observed that those whose parents were taught to sing have this perception ($p<.048$).

When the perception of voice problems (VHI) and the rest of the variables of the studied categories are observed, we verify that only the context variables present significant correlation results: "They tell me that I sing poorly" ($r=172$; $p<.010$) and, conversely, "My family sings" ($r=-.172$; $p<.010$). And the variables on self-concept of vocal and musical abilities

also correlate inversely: "I have musical skills" (r=-.164; p<.014), "Singing comes easily to me" (r=-.154; p<021) and "I sing without effort" (r=-.162; p<.015).

3.4. 4th-year students' opinion on their education and the use of the singing voice by the internship teachers in the classroom

Finally, the answers to the questions addressed only to fourth-year students show us that 90.3% of the participants consider that it is important to have music subjects in their degree, despite the fact that only 21.4% believe that it is necessary to sing well to be a kindergarten teacher. However, 86.6% see themselves singing in the kindergarten classroom.

Almost 75% of 4th grade students think that during the grade they have not obtained resources to sing and only 25% consider that throughout the grade their singing has improved. 59.8% think that the songs learned in the degree are interesting.

In relation to the observation of the teachers during the internship periods, the participants have reported that 38.5% of them do not sing daily with the children. And of those who sing, they consider that only 42.3% of them do so in a tuned and expressive way. Furthermore, 14.5% of the teachers were dysphonic. Likewise, 38.4% of the responses indicate that the teachers normally did not sing in the classroom and used recorded music, although these have motivated them to sing in 42.3%.

Table 5. Questions and percentage of responses from 4th-year students regarding their education and the use of singing by internship teachers in the classroom

	Disagree		**Agree**	
	1	**2**	**3**	**4**
It is important to have music subjects in the degree	1.9	7.8	30.1	60.2
It is necessary to sing well to be a preschool teacher	29.1	49.5	17.5	3.9
During the degree, they have taught me resources for singing	36.9	36.9	19.4	0
Throughout the degree, I have improved my way of singing	39.8	34	21.4	4.9
The songs learned during the degree are interesting	6.9	33.3	41.2	18.6
I see myself singing in the preschool classroom	1	12.6	32	54.4
The practice teachers sang in the classroom daily	16.3	22.1	34.6	26.9
The practice teachers sang in tune and expressively	14.4	43.3	25	17.3
The practice teachers usually did not sing and used recorded music	22.1	39.4	19.2	19.2
The practice teachers were hoarse	54.8	30.8	13.5	1
The practice teachers motivated me to sing	32.7	25	24	18.3

4. Discussion and Conclusions

The students in the Early Childhood Education degrees who participated in this research do not have a positive self-concept regarding their vocal abilities. Only about 30% of them believe they have a beautiful voice, find it easy to sing in the written pitch, and sing in tune effortlessly. As a result, two-thirds of the sample studied do not consider themselves good singers, which could lead future teachers to resist engaging in singing activities in the classroom, as Abril (2007) suggests. This observation aligns with the findings of 4th-year students during their teaching practicum, where they explained that, in 38.4% of cases, the mentor teachers used recorded music and did not sing regularly in the classroom. All these data correspond with the results of Swain and Bodkin-Allen (2014), who observed that most teachers do not feel adequately prepared to sing, consider themselves musically inept, and hold negative feelings toward singing.

It is also important to note the results of Heyning (2011), which show that those who feel untalented experience anxiety and may choose not to sing in the classroom. Consequently, this self-limiting belief may restrict the use of singing in the classroom, as Pascale (2005) asserts. Moreover, in line with West (Swain, & Bodkin-Allen, 2014), criticism of a person's singing voice is often interpreted as a personal attack because one's voice is closely tied to one's identity. It is also observed that those who believe they lack vocal skills and are told that they sing poorly are the least likely to see themselves as vocal models for children. In other words, they believe that their way of singing does not influence how children sing.

On the other hand, students with a positive self-concept regarding their vocal abilities also have a better emotional perception of singing and feel comfortable and secure while singing, as observed in the studies by Swain and Bodkin-Allen (2017). However, the fact that a high percentage of students (65.2%) prefer singing in a group rather than solo and sing more when they are alone than with friends might indicate that singing in front of peers arouses some aversion, as suggested in Oriola's (2022) study.

The results obtained do not show any differences between 1st and 4th-year students, indicating that Early Childhood Education degrees are not succeeding in making their students vocally competent. Likewise, the majority of 4th-year students believe that the program did not provide them with tools to improve their singing. One aspect that improves among 4th-year students is their awareness that they will be vocal models for their future students, although the percentage agreeing with this statement is still low (46.2%). Among these students, the perception that all individuals can sing also improves.

A notable pattern observed among 4th-year students can be summarized as: "I am not vocally competent, but it doesn't matter because I will not be a vocal model, and it is not necessary to sing well to be an Early Childhood Education teacher." This perception is also supported by the fact that, during their practicum, the students observed that nearly 60% of the teachers did not sing in tune or expressively. This raises the question of how much importance future teachers place on singing in the classroom. From this perspective, it would be interesting to review the curriculum of the Early Childhood Education degree and consider whether it gives sufficient emphasis to voice and musical expression.

In this study, it was observed that variables in the contextual category have a strong impact. Although correlation does not imply causation, the fact that some variables we asked about occur prior to others in the temporal sequence allows us to claim that they have a certain influence on the rest, even though we cannot assert that there are hidden variables justifying the results in another direction (Attorresi, *et al*., 2009). In this sense, one of the most significant findings of this study is that students who come from homes where singing is a common activity tend to have a more positive self-concept regarding their vocal and musical abilities. Therefore, it can be inferred that normalizing singing in daily life has a significant influence on a person's identity as a singer, in line with the findings of Abril (2007) and Pascale (2013). It appears that informal education and positive early experiences (Pascale, 2013) may facilitate the development of vocal and musical skills. Thus, those who sing at home see themselves as vocal models and believe that singing well is important in order to be Early Childhood Education teachers. In Abril's (2007) research, music teachers and family members appeared to have the most significant influence on shaping beliefs about singing ability and singer identity. Consequently, Early Childhood Education teachers can either create positive or negative

experiences related to singing. This underscores the importance of equipping teachers not only with improved vocal skills but also with the ability to foster early experiences for their students.

Regarding vocal health, the vast majority of students do not perceive voice problems, but 12.9% already have vocal health issues before entering the job market, which, as Van Houtte (2011) asserts, will have an impact on their professional and personal lives. Considering the results, having a family that sings may serve as a protective factor against vocal problems. Having a voice problem adds an obstacle to singing in the classroom, making it more challenging for these teachers. It is unknown whether 4th-year students can discern the degree of dysphonia, only the presence or absence of it. Nevertheless, 14.5% of the students observe teachers-mentors who exhibit dysphonia in the classroom, findings consistent with previous studies on vocal prevalence in teachers (De Jong, *et al*., 2006; Roy, *et al.*, 2004).

In conclusion, singing is a crucial musical activity. However, this study shows that students have a self-concept about singing that limits them. Those who come from families where singing is a part of their lives not only have a better self-concept but also understand that it is necessary for teachers to sing well in the classroom because they serve as vocal models for their students. In this regard, these findings align with Austin's (1990) perspective, which emphasizes that students' musical self-concept has a definitive influence on their behavior in the classroom and their motivation to engage in musical activities.

According to the results obtained in this research, the Early Childhood Education degrees studied do not provide their students with adequate resources to improve their vocal competence and self-concept. Furthermore, there is a lack of investment in the prevention and detection of voice problems in a group particularly vulnerable to these disorders. Although the sampled students do not perceive having voice problems, the literature warns of the high prevalence of these disorders, and the students themselves observe that many of their mentors have vocal issues. It is clear that a teacher with vocal problems will either not sing in the classroom or will do so damaging their voice even more, ultimately serving as a poor vocal model for young children. It should be remembered that children aged 3-6 years are in the midst of speech development, and it is essential for the vocal models they encounter to have healthy voices.

The predominant image of Early Childhood Education teachers described by students in this research is that of teachers who do not sing daily but use recorded music (Bainger, 2010), and when they do sing, they do so without expressiveness and with poor pitch. This model does not encourage students to feel the need for vocal competence, nor does it emphasize the importance of singing in the classroom. As Ehrlin and Wallerstedt (2014) assert, teachers who trust in their own competence are required for music and singing to have a significant place in daily work. Therefore, it is necessary to work on introducing changes in the curricular design of initial teacher education programs for Early Childhood Education to allow sufficient time for improving students' self-concept and vocal competence.

In future research, it would be interesting to continue this line of work with a larger and more balanced sample, involving more universities. Additionally, it would be advisable to analyze the different curricula of the Teacher Education programs involved in this research to study their impact in contrast to the results obtained. It would also be beneficial to collect objective data on vocal quality to compare them with perceptual data, as the results obtained

with the latter do not align with the prevalence rates of voice problems described in the literature.

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ARTICLES

Digital platforms for music production (DAW): educational innovation from music teacher training

Plataformas digitales de producción musical (DAW): innovación educativa desde la formación docente del profesorado de música

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Abstract

This article analyses the possibilities of digital music production tools in the field of music teacher training. To do so, it identifies the different fields of action and the projection of music production resources in the educational environment, as well as the tools and functionalities of the Digital Audio Workstation (DAW) as a didactic resource. Based on the above, an action-research is carried out within the framework of secondary education teacher training of the music specialty of University of Salamanca, through a series of learning situations developed using the DAW and aimed at the acquisition of basic knowledge, the development of competences and the assimilation of music production concepts. The work shows how the DAWs are a very powerful and versatile resource for articulating learning situations that promote meaningful learning in real contexts, the development of creativity, the assimilation of complex and abstract concepts, while at the same time boosting self-esteem, motivation, and commitment to the subject.

Key words: Musical education; Digital didactics; Secondary Education; ICT.

Resumen

El presente artículo analiza las posibilidades de las herramientas digitales de producción musical en el ámbito de la formación docente del profesorado de música. Para ello, se identifican los diferentes ámbitos de actuación y la proyección de los recursos de producción musical en el entorno educativo, así como las herramientas y funcionalidades de las *Digital Audio Workstation* (DAW) como recurso didáctico. A partir de lo anterior, se desarrolla una investigación-acción en el marco de la formación del profesorado de Educación Secundaria de la especialidad de Música de la Universidad de Salamanca, a través de una serie de situaciones de aprendizaje desarrolladas mediante las DAW y orientadas a la adquisición de saberes básicos, desarrollo de competencias y asimilación de conceptos sobre producción musical. El trabajo pone de manifiesto como las DAW son un recurso muy potente y versátil para articular situaciones de aprendizaje que fomenten el aprendizaje significativo en contextos reales, el desarrollo de la creatividad, la asimilación de conceptos complejos y abstractos, al tiempo que potencien la autoestima, la motivación y el compromiso con la materia.

Palabras claves: Educación musical; didácticas digitales; Educación Secundaria; TIC.

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1. Introduction

The advances that have taken place in the field of technology from the last century to the present day have had a great impact on the field of music; both in the ways of creating, performing, recording, or disseminating/accessing music (Bauer, 2020) and in the epistemological and methodological foundations that inspire didactic innovations in the field of music education. The tools and resources resulting from these advances constitute a potential learning mediating agent that can be used from different perspectives depending on the objectives and their didactic projection (Tejada, 2004). From this perspective, the implementation of digital technologies in the music classroom not only implies new ways of approaching composition, performance, and response to the musical phenomenon (Dammers, 2012), but also favours the acquisition of digital competence and the development of interconnected educational communities that play a fundamental role both in the structuring of educational ecosystems and in the achievement of certain SDGs (Merchán, *et al.*, 2023). In this context it is important to understand what can be achieved through the creative use of music technology and its potential to transform the nature of music itself and how it is taught (Savage, 2010).

Therefore, this paper aims to highlight how the use of the Digital Audio Workstation (DAW) in music teacher training enables the articulation of learning situations that favour the connection with the students' musical world beyond the classroom, incorporating the artistic and functional practices of the contemporary socio-cultural environment both in the spaces of formal education and in those of continuing teacher training. As Berrón and Monreal (2020) point out, in the field of music pedagogy, university teachers cannot ignore the importance of developing pedagogical competence in methodological innovation in the initial training of future teachers. In this context, this action-research (AR) project (Sandín-Esteban, 2010) is highly significant because the development of new teaching methodologies through DAWs is an object of study that is emerging with great vitality in the academic field, with the particularity that its learning and mastery curve can be challenging for those teachers who do not have previous knowledge in this area; and it also represents a paradigmatic resource for the validation and improvement of teaching methodologies. Imbernón (2012) further states that although the research-teacher training relationship has advanced considerably and has provided clues on how to better plan teaching, a future can be foreseen in which this type of research on training processes in educational institutions must assume a greater presence in order to improve the educational ecosystem.

From this methodological framework, this article confirms how the easy access to DAWs and the enormous possibilities they offer, their proximity to the musical paradigm of the students, as well as the advantages they offer both for musical learning and for the promotion of autonomy and creativity, are aspects that justify their integration in the music classroom as a resource that supports paradigmatic learning situations to address a large part of the basic knowledge and the development of specific competences in music education. Furthermore, the research validates its implementation in university teacher training programmes, highlighting how reflection from educational research should be situated in the detection of emerging pedagogical needs (Holdhus, *et al.*, 2022) and how to provide a critical response adapted to the new technological possibilities, "transcending the mere translation of teaching-learning processes that took place in the analogue world to the digital world" (González, & Merchán, 2022, p.3).

2. Digital Audio Workstation: the portable production studio as a musical instrument

Nowadays it is possible to use music production as an educational resource through what are known as DAWs, software platforms for recording, editing, and producing music, by manipulating, organising, and processing digital sound in different tracks, many of them, such as BandLab, SoundTrap, Soundstation or Amped Studio, which are freely available online. The main advantage of these tools is that they allow all the stages of the process of creating, recording, and producing music in a professional studio to be carried out from a computer by abstracting all the elements and devices that make up the studio and integrating them into a flexible, modular, and portable virtual space. These platforms make it possible to record real sounds, work from advanced sound synthesis, design and apply digital sound effects, favouring the elaboration of arrangements, the creation of soundtracks or backing tracks and, in general, to produce and edit all kinds of music or sound recordings.

Likewise, DAWs offer practically unlimited possibilities in the service of fostering creativity, which translates into a great potential for the transmission and development of musical and aesthetic ideas, transforming its original character from an auxiliary tool for sound recording to its current conception as a musical instrument directly involved in almost all the processes of creation and performance (Bell, 2015). Moreover, it allows working with sound synthesis and manipulation, introducing the possibility of entering other musical paradigms centred on the sound element as a taxonomic unit of sound-based musical creation (Landy, 2007), expanding the aesthetic and creative possibilities beyond the boundaries of the tonal sphere, making it possible to introduce other aesthetic frameworks in the environment of electronic and/or experimental music. For this purpose, DAWs have a virtual mixer that facilitates working together with different tracks, sequencers, different types of sound synthesisers, virtual instruments, effects modules or sound libraries that allow almost any imaginable creative process to be tackled. In addition, they allow the import of musical works edited using score editors such as MuseScore or Sibelius, favouring the creation of productions through conventional musical writing.

In DAW studios, interaction with the elements of musical logic is carried out through a section called piano roll (Figure 1), which consists of a grid system representing time on its horizontal axis and musical pitches on the vertical axis, which favours the manipulation of sound events in a simple and intuitive way. In this sense, Kardos (2012) highlights the usefulness of this section for the assimilation of contents related to harmony, melody, rhythm, formal structure, or the production of arrangements in a very visual and didactic way and points out how these systems help to balance the possible disparity of levels in the classroom by virtue of their ability to show interactive contents at a lower level of abstraction and granularity.

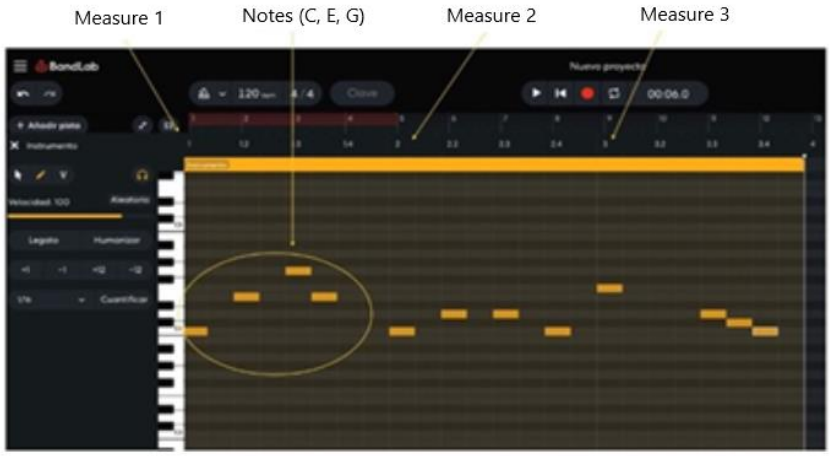

Figure 1. Piano Roll in DAW BandLab

3. Method

3.1. Context

This research has been developed in two annual cycles within the master's degree in Secondary Education and Baccalaureate, Vocational Training and Language Teaching at the University of Salamanca, from 2020 to 2022, extending these methodologies and proposals to subjects such as musical expression in Early Childhood Education.

3.2. Objectives

The main objective of the research is to analyse the didactic possibilities and the perception of DAWs as a resource for the specific training of music teachers through the approach and discussion of a series of learning situations (LS) related to the basic knowledge and competence development prescribed by the curricular regulations.

3.3. Design

The present work is articulated around a methodological apparatus (developed in the field of active methodologies) that integrates action research (AR) from a practical perspective (Kemmis, 2009), which implies a transitive and reciprocal relationship between the teacher (researcher) and the students and project-based learning (PBL) as a creative and consensual process. The eminently practical approach of these methodologies aligns very conveniently with the concept of DAWs as an instrumental resource for critically interrelating theory, practice, and artistic creativity, aimed at improving teaching practice (Lankshear, & Knobel, 2004). To this end, a series of stages are established, following the proposal of Kemmis and McTaggart (2005):

- Analysis of the issue: presentation of the technological resource (DAW) and its possibilities in the field of education; debate on music education based on creative practice; identification of areas for improving teaching through innovation through PBL.
- Planning: analysis of the stage objectives, basic knowledge and curricular competences, and identification and selection, among them, of the areas of application of the DAWs.

- Development: the design of a series of group learning situations (LS) related to the previously selected fields of action is proposed and discussed.
- Observation: analysis of the course of some of the activities and the results, both from the perspective of the development of the process and of the final product.
- Discussion and evaluation: finally, spaces are created for discussion and reflection on processes and outcomes and for obtaining data on the perception and performance of these.

In each academic year, a diagnostic evaluation of the students' competences and a final evaluation were carried out by means of oral questioning and observation of the students, to be able to compare the degree of achievement of the didactic objectives set and the perception of the technologies used through critical debates directed by means of semi-structured questions. Similarly, to reduce the perceptive bias of the participating researcher, the results obtained by the teacher-researcher are triangulated and contrasted with the participating students' own perceptions. A total of 47 students (N=47) took part in the research.

4. Methodological proposal for classroom work

The efforts made by educational institutions to implement digital technologies in teacher training processes have become essential to ensure quality and inclusive education, while maintaining a system that is able to meet the new educational challenges (Domínguez, & Pino, 2020). In this sense, the Master's Degree in Secondary Education and Baccalaureate, Vocational Training and Language Teaching (MUPES) at the University of Salamanca is a professional qualification that qualifies students to work as teachers in Secondary Education and Baccalaureate and has as its main objective (OG1)[5] that students know how to apply, as future teachers, the knowledge acquired and their ability to solve problems in environments related to the speciality studied. Within this framework, this degree includes specific subjects in the teaching innovation blocks aimed at the implementation of digital didactics and methodological developments based on the use of technology. In the current regulatory framework for Secondary Education in Spain (*Organic Law 3/2020, of 29 December, which amends Organic Law 2/2006, of 3 May, on Education, LOMLOE*), technological resources and tools in the subject of music, from the first to the third year, are considered transversally both in the specific competences and in the assessment criteria and basic knowledge. In this context, DAWs are a technological resource that can be applied in all the basic knowledge blocks[6] and facilitate the development of specific competences. This methodological proposal shows learning situations (LS) grouped in relation to the blocks (A) *Listening and Perception*; (B) *Performance and Improvisation and Scenic Creation* and (C) *Contexts and Cultures*, indicating the specific competences (SC) to which each of them is related[7].

4.1. Block A. Listening and perception

4.1.1. Physical qualities of sound and the use of virtual instruments. SC (1)(4)

Starting from a previously selected musical fragment, the possibilities of manipulating the sound characteristics of each track (timbre, intensity, duration) are considered to analyse their

[5] Referenced according to the curricular regulations of the MUPES Master's Degree (University of Salamanca). Available at: https://www.usal.es/files/competencias_1_0.pdf
[6] Referenced according to the EducaGob portal. Available at: https://lc.cx/cojV3T
[7] Curricular elements referenced in relation to the classification established in: EducaGob: Portal del Sistema Educativo Español. Available at: https://lc.cx/cojV3T

repercussion on the musical proposal, from the point of view of perception and impact at an artistic level. Among these, the manipulation of the editing parameters in different virtual instruments stands out, investigating the configuration possibilities they offer, with the aim of analysing how they help to establish stylistic marks in different genres of contemporary popular music. This learning situation favours the discussion of issues such as the general classification of instruments and the role of timbre in sound discourse.

4.1.2. Sound analysis, generation, and synthesis. SC (4)(2)(1)

Along the same lines, this LS proposed the analysis and projection of timbre as a compositional structure (Peyrou, 2022), and experimentation with some of the predetermined sounds offered by the synthesizers integrated in DAWs (presets). Once familiarised with these possibilities, and as a reverse process, the selection of a series of paradigmatic sounds of current music is proposed to try to synthesise and emulate them through the tools of the DAW. The LS approach serves as a theoretical-practical substrate to address how a large part of the sound profiles, understood as the main components at a timbral and structural level, characterise many of the genres of today's popular music. Similarly, the question can be transferred to the field of classical music, discussing how the conductors of large orchestras and instrumental and/or vocal ensembles develop their own aesthetic imprint by manipulating assimilable sound parameters, or how compositional structures based on timbral aspects are often representative of genres, periods and/or cultures.

4.1.3. The sound effect as an artistic resource. SC (2)(4)

The following SA is developed through the use of a musical fragment (accompanied melody) elaborated through the MuseScore platform and exported as a MIDI file to the DAW BandLab[8], and consists of the application of different digital effects to the tracks that make up the work, experimenting with the available editing parameters. This proposal is carried out after active listening and the corresponding explanation of the main types of effects, grouped into the following categories:

- Delay: Reverberb, echo and delay.
- Modulation: Chorus, tremolo, flanger and phaser.
- Dynamics: Distortion and compression.

The tasks developed in this LS allow us to deal with concepts related to musical acoustics such as modulation, frequency, or amplitude, linked to the qualities of sound and its incidence at an aesthetic and discursive level in musical production (Thibeault, 2017).

4.1.4. Pedagogical projection: DAWs in *Listening and Perception*

The act of critical listening is inherent to the enjoyment, understanding and learning of music. In this sense, music production has been revealed as a process that facilitates competences related to the understanding of sound as a physical entity, allowing the identification, evaluation

[8] Available at: https://www.bandlab.com/

and manipulation of certain characteristics and parameters directly related to constitutive aspects of forms, styles, or aesthetic paradigms of musical expression.

The intervention favours an interesting debate in relation to the implications of the elements of sound from the point of view of its use as a compositional resource for the creation of textures and creative resources, introducing examples such as timbre consonance/dissonance or concepts and functions such as orchestration and its relevance as a structural factor in musical discourse (Walzer, 2016). From this perspective, the impact that these issues have on musical creation, performance and their use as an element shaping the musical canon of many styles in the context of urban popular music is highlighted (Reuter, 2021). In the same way, the pupils state as extremely interesting the possibility of experimenting with the creation of their own sounds with the intention of representing concepts, feelings, or moods, configured through free experimentation with the controls in terms of different applications (narration, programme music, ambient music, etc.). Finally, the effect of Auto-tune as a creative resource and its semiotic projection in different musical styles was analysed on a technical and aesthetic level.

4.2. Block B. Performance, improvisation, and stage creation

4.2.1. Creation of backing tracks. SC (2)(4)

Backing tracks (BT) are instrumental accompaniment productions, generally used for musical practice and/or improvisation. These recordings replace the soloist's accompanying parts, emulating a particular instrumental ensemble. In this LS the students were faced with the creation of a BT, based on a blues progression, for improvisation practice, analysing and discussing issues related to harmony, instrumentation, tempo, tonality, etc. The possibility of working on tracks offered by DAWs made it possible to implement complementary didactic strategies related to the substitution of specific parts, rhythmic superimposition, identification, and application of arrangement techniques, etc.

4.2.2. Music creation based on loops and mash-ups. SC (1)(2)(2)(4)

Loop-based composition is a technique for creating simple musical works by creatively joining together pre-configured musical fragments. Extending the concept, the mash-up technique refers to the combination (Figure 2) of two or more songs (or fragments thereof), while maintaining the integrity of their constituent elements, to create a new and original work. This requires a certain degree of similarity between them in terms of tonality, harmony, or rhythm, so that the new creation is musically coherent. In a preliminary way, the skills of musical analysis and the search for musical information are worked on according to the criteria that affect musical logic itself. The LS results in one of the most paradigmatic products of this type of creations by synthesis of pre-existing works, consisting of combining recordings of vocal works (*a cappella*), which play the melodic function, with another work of an instrumental nature that acts as the rhythmic-harmonic base of the latter.

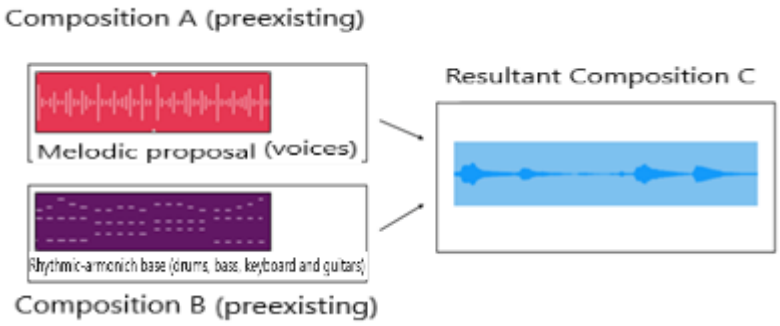

Figure 2. Process of music creation by mash-up

4.2.3. Improvisation. SC (2)(3)

Using the BTs created in the previous LS, the future teachers took advantage of the instrumental practice to work with the DAWs on their improvisations in the classroom. This task was preceded by an analysis of the blues structure as a framework for improvisation, the development of motifs or adaptation to the style, addressing issues such as the scale-chord relationship, the superimposition of triads, modal improvisation, etc. This practice was used in parallel to work on the approach to different musical genres from the perspective of achieving respect for multiculturalism (Bernabé, 2013).

4.2.4. Creation, recording and basic editing of a musical work. SC (1)(3)(4)

Following Bielmeier's proposal (2021) for the elaboration of a musical production (planning, pre-production, recording, post-production, and distribution), a LS is proposed aimed at approaching the production of an original creation. The project contemplates the approach to musical creation as a process for tackling basic knowledge about the constituent elements of the musical phenomenon: form, structure, tonality, musical scales, harmonic development and rhythm, arrangements, prosody, etc. Likewise, the production process analyses the phases of recording acoustic instruments with editing and mixing of virtual instruments and was the guiding thread for the presentation and acquisition of specific competences such as exploring the expressive possibilities of different musical techniques, developing criteria for selecting the most suitable techniques for the expressive intention or identifying the main stylistic features of different forms and styles.

4.2.5. Pedagogical projection: DAWs in *Performance, Improvisation and Stage Creation*

The process for the elaboration of backing tracks (Figure 3) favoured the internalisation of the basic elements of music and formal schemes for the construction of musical productions, being used in performance and improvisation activities through which questions related to phrasing, the development of motifs or the discursive possibilities of each harmonic progression are addressed. Along these lines, DAWs encourage creativity by allowing experimentation with their wide range of sounds, effects and timbral possibilities in the elaboration of the most appropriate instrumental bases for each of the musical aspects to be worked on.

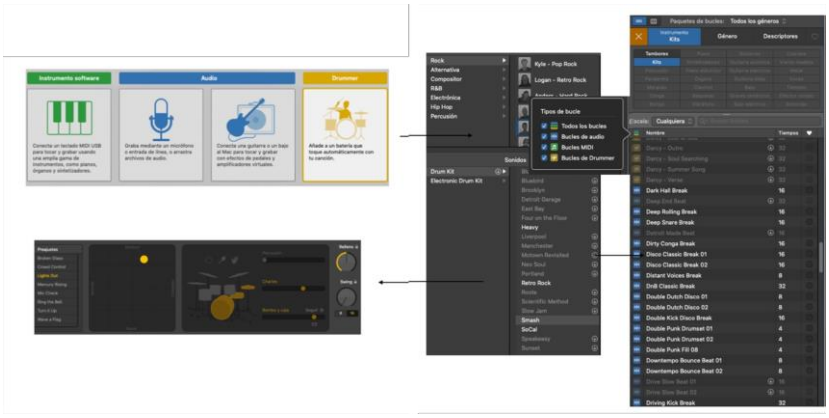

Figure 3. Example of the process of composing backing tracks

The more complex music creation activities (Figure 4) are carried out when the students have a certain degree of familiarity with the DAWs, focusing on the musical aspects and the development of musical creativity. This process proves to be well suited to address, in an interrelated way, the most basic aspects of composition in a real environment, adapted to the context and closely conducive to experimentation.

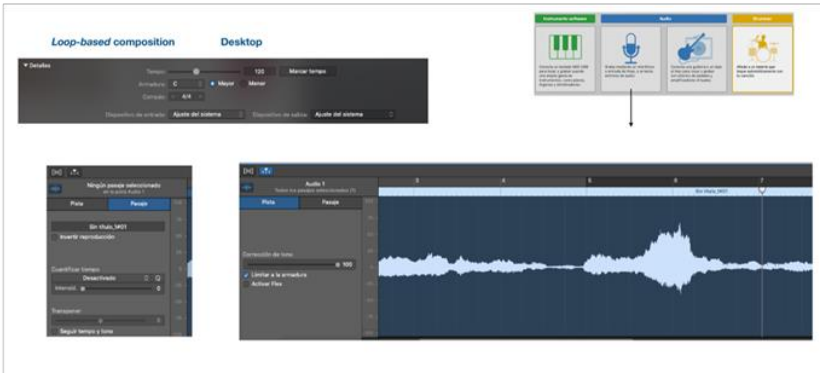

Figure 4. Example of the compositional process using loops

4.3. Block C. Contexts and cultures

4.3.1. Music in audiovisual narrative. SC (2)(4)

The first LS related to the *contexts and cultures* block deals with the capacities of expression, connotation, and significance of music in relation to the image from an extradiegetic perspective. To this end, a scene from the film *The Shape of Water* (2017) is proposed as an example, to elaborate two variants of it: in one case, by choosing different pre-existing musical fragments, and in another, by producing an original fragment aimed at evoking preconceived effects. In this context, the process of identifying and selecting the music was discussed, and the effects on the viewer's perception, the sensations and emotions generated, the expressive projection and the semiotic and narrative transformations resulting from the application of different musical backgrounds were critically analysed.

4.3.2. Music and video games. SC (1)(2)(4)

Continuing with the issues addressed in the previous scenarios, in this LS, the development of certain musical fragments is proposed, as a soundtrack, to accompany a series of

predetermined passages of the music video game *Lost in Harmony* (2016). The planning includes a series of guidelines and resources to structure the productions: analysis of the narrative aspects of the audiovisual fragment, selection of the musical style, instrumentation, tempo, meter, questions of tonality and harmony, soloist, and accompaniment functions, etc. In addition, it is proposed to begin the process by starting from a generative motif on which to build the rest of the composition: a rhythmic scheme, a chord progression, or a melodic motif.

4.3.3. Pedagogical projection: DAWs in *Contexts and Cultures*

Working with DAWs as a means of producing audiovisual-oriented productions reinforces the acquisition and understanding of basic curricular knowledge and the understanding of the musical phenomenon through artistic self-experimentation, enabling the development of creativity without the need for highly specialised prior knowledge. Furthermore, the use of DAWs and music technology provides a wide variety of new possibilities for educational applications. In this sense, experimentation with the recording process led the students to a critical reflection on current musical trends and their own musical tastes through a series of approaches and discussions that allowed triangulation with the rest of the data obtained in the study. In short, basic notions of DAWs at an operational and conceptual level allow for a significant understanding of the compositional structures of music, its forms, the role of organological expressions or the characterisation of genres and styles through the exploration and interaction with the structural elements of music.

5. Evaluation of proposals

Competence assessment in creative processes is a multifaceted and complex issue that does not offer generalisable, context-independent solutions. On the other hand, as Bielmeier (2021) points out, assessing performance based on the result of the product and artistic quality in a basic level project is counterproductive because it delegitimises the pedagogical value of procedural development. Therefore, assessment is approached through the analysis of the development of the technical, creative, and social skills involved in the students. In this way, musical, creative, and concept-application results are assessed and quantified, focusing on the skills to manage, apply and develop the creative process. In short, the ability to solve problems creatively, autonomously and in terms of the application of knowledge and competences, as well as their level of appropriateness, are valued. In these cases, as Clauhs, *et al.* (2019) argue, the use of rubrics is very useful for assessing music teaching/learning through technology, especially given the difficulty of assessing artistic and creative aspects through other types of procedures. Table 1 below shows the rubric developed and used for the evaluation of the projects:

Table 1. Rubric model for assessment of DAW-based Learning Situations

	Superficial	**Acceptable**	**Very good**	**Excellent**
Level of capacity to identify operational strategies	Partially identifies, with significant errors, some strategy to solve the problems posed by the LS	Identifies different strategies for solving LS problems	Clearly identifies a set of appropriate strategies to solve the problems posed by LS	Clearly identifies optimal strategies for solving LS problems
	Superficial	**Acceptable**	**Very good**	**Excellent**

Identification of techniques and functionalities related to the requirements	Partially identifies, with significant errors, some of the appropriate techniques and functionalities to solve the objectives set	Identifies different techniques and functionalities to solve the objectives set out	Clearly identifies a set of techniques and functionalities appropriate for solving the stated objectives	Clearly identifies the optimal techniques and functionalities to solve the stated objectives
	Superficial	**Acceptable**	**Very good**	**Excellent**
Level of adequacy of objectives/results	The results are only partially in line with the objectives of the LS	The results correspond well with the objectives of the LS	The results correspond very well with the objectives of the LS	The results correspond in an optimal way with all the objectives set out in the LS
	Superficial	**Acceptable**	**Very good**	**Excellent**
Level of creative development	Superficial or uninteresting artistic and aesthetic appeal	Acceptable artistic and aesthetic appeal with some original and interesting musical ideas	Great artistic and aesthetic appeal. Conveys originality, aesthetic coherence, and musical interest	Artistically and aesthetically impressive with great power of persuasion and musical communication

Subsequently, after analysing the assessment results of the first annual cycle, two items (Table 2) related to the degree of adaptation to the criteria previously established by the teaching staff and to the self-perception of performance through self-assessment, to be filled in by the students for self-management of the process, were incorporated into this assessment instrument as a proposal for improvement.

Table 2. Development of the rubric for evaluation of DAW-based Learning Situations

	Superficial	**Acceptable**	**Very good**	**Excellent**
Adequacy	Little or no compliance with the criteria previously established by the teacher	Irregular adequacy, exclusively fulfils some criteria previously established by the teacher	Good compliance with the criteria previously established by the teacher	Full compliance with the criteria previously established by the teacher
	Superficial	**Acceptable**	**Very good**	**Excellent**
Self-assessment	The perception of the work carried out in the group is superficial. Very low degree of involvement in the project	The perception of group work is good. Low degree of involvement in the project	The perception of the work carried out individually and/or in groups is very good. High degree of involvement in the project	The perception of the work done in the group is excellent. Very high degree of involvement in the project

Similarly, a rubric is applied to ascertain the suitability of each of the LS and the DAW as a technological resource for tackling each of the basic knowledge and developing the different basic competences related to each of the LS. The results (Table 3) are evaluated by means of a synthesis of the perception of the students themselves and of the teacher in charge of tutoring the LS. In this case, a similar generic scale is retained with the values superficial, acceptable, very good and excellent.

6. Results and discussion

The use of DAWs and knowledge of the music production process is shown to be a resource with great impact in the music classroom, offering multiple possibilities for the development of learning situations related to the basic knowledge reflected in the curricular regulations. These resources act as a backbone to interrelate and create spaces where autonomous learning, specific technological literacy and musical contents converge (Figure 5), and their implementation for the development of learning situations is perceived as very positive.

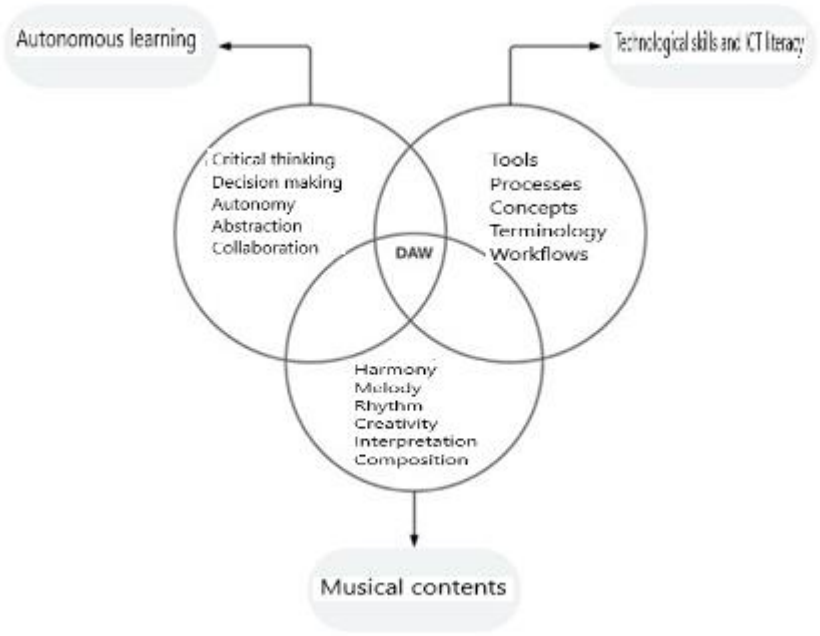

Figure 5. DAWs as the backbone of the teaching-learning process

The results obtained (Table 3) show descriptively the perceived level of operability of the DAWs for the acquisition of basic knowledge and the development of the specific competences associated with each LS.

Table 3. Results obtained from the perception of the level of operability of DAWs in the music classroom

	Superficial	Acceptable	Very good	Excellent
SA. The sound	0%	0%	42%	58%
SA. Sound synthesis	8%	16%	42%	33%
SA. Sound effects	8%	25%	25%	42%
SA. Backing tracks	0%	8%	17%	75%
SA. Loops and mash-ups	0%	25%	33%	42%
SA. Improvisation	0%	0%	8%	92%
SA. Creation	0%	0%	16%	84%
SA. Narrative	0%	16%	25%	59%
SA. Video games	0%	16%	17%	67%

As can be seen, most of the LS are perceived as very good or excellent, reaching almost 100% in areas such as improvisation or creation; it is clear in this case that the activities related to purely creative aspects, where students can express themselves individually, propose their own vision or develop artistic expressiveness, are the ones that are significantly more attractive. In the rest of the areas, DAWs are perceived as acceptable, very good or excellent, and there are only

two areas (synthesis and sound effects) where some of the participants consider them to be a superficial resource; in these cases, the high technicality, and the relation with acoustic or technological aspects, far from the musical subject itself, may be the underlying causes for a less enthusiastic perception.

From a qualitative perspective, the data show how activities centred on the production of many of the most popular musical genres among young pupils enable the development of creativity through productions that serve to promote different skills, assimilate concepts and knowledge in a real context and encourage motivation and commitment to learning the subject thanks to the proximity and recognition of an aesthetic paradigm perceived as their own. Classroom discussions highlight how pupils systematically opt to incorporate, make visible and situate these musical paradigms as repertoires of their own in the curriculum on an equal footing with other musical cultures traditionally assimilated as academic or canonical. Furthermore, the strengthening of the creative aspects of the proposals developed allows us to overcome the traditional approach to technologies focused on the understanding of technical and operational procedures, lacking a strong creative approach (Wise, 2016), to move on to explore, as a priority, their creative and expressive possibilities as an organological element and musical instrument (Bell, 2018). In this way, the proposed approaches are shown as a reference to enhance the way in which students apply digital technologies to their own learning and creative production, emphasising the development of the capacity for expression through technology and not only the technical skills necessary for the management and operation of systems or applications (Pierard, & Lines, 2022).

The development of the creative facet fosters in parallel an evident motivational commitment closely related to the increase of self-esteem and the self-perceived improvement of competence. After various discussions related to the post-intervention questioning, it can be seen (Figure 6) that a large majority of students (76.6%) show a high degree of motivation in relation to the perceived artistic experience and the course of the learning process. Only 8.5% of the students perceive the tool and the training approaches as not very motivating and none of the participants find it not motivating at all. From this fact (no rejection) it can be deduced, moreover, that both the operational issues and the relation of the proposals with the curricular contents are understandable, close, and assimilable by the students.

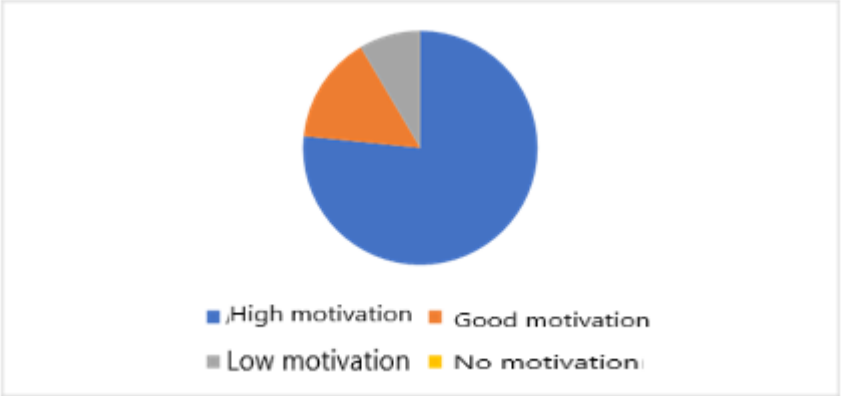

Figure 6. Degree of motivation and perceived satisfaction of the student

Similarly, the data support the significance of the music production practices and aesthetic frameworks from which many of today's popular music genres are developed. In this sense, understanding how music is created and recorded, and the process from the original idea

to the final product, "cannot be sufficiently analysed and understood without taking into account all the technical and creative processes in the recording studios" (Faure, *et al.*, 2020, p.80). Consequently, music production, besides strongly favouring the acquisition of specific skills and promoting technological literacy, has made it possible to raise LS related to the process of music creation, listening and critical reflection on genres, periods, aesthetic and stylistic features, and the role of music in a multimedia environment. The instantaneous feedback offered by the sound reproduction of each editing or creation process allows students to handle multiple representations of the contemporary musical imaginary and to analyse the different parts of the creation, facilitating decision-making and discussion on musical aspects in a less abstract way (Biasutti, & Concina, 2020), producing a significant transformation at the epistemological level between traditional pedagogies based, to a large extent, on the transmission of theoretical knowledge through the magisterial discourse.

In a subsidiary way, it is very eloquently corroborated (Figures 7 and 8), in line with Faure *et al.* (2019) and Baño and Pozo (2023), how the use of DAWs in music education improves the social climate in the classroom and develops and enhances personal autonomy and creativity. This question is particularly interesting in an educational context such as the present one in which the development of creativity through technological interaction is a characterising precept of music education in the 21st century (Ferguson, & Brown, 2016).

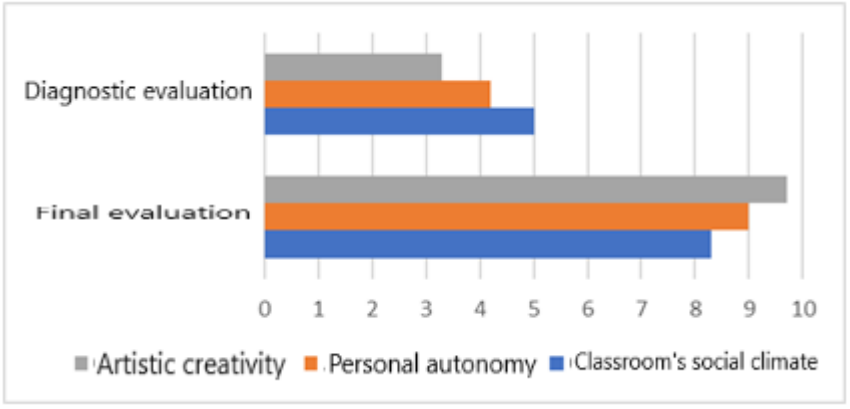

Figure 7. Implementation of DAWs in the first annual cycle: Social climate, personal autonomy, and creativity in the classroom

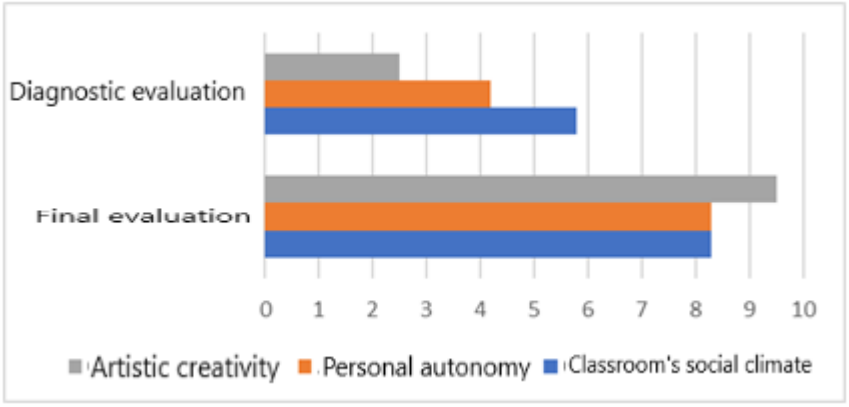

Figure 8. Implementation of DAWs in the second annual cycle: Social climate, personal autonomy, and creativity in the classroom

In the context of digital literacy, it is clear from the various debates held that the use of ICT in student education has not gone beyond the anecdotal and is limited, in many cases, to the

projection or reproduction of audiovisual content, information search and selection tasks or the sporadic use of applications for mobile devices, findings that are in line with the ideas set out in Merchán *et al*. (2022). In this sense, DAWs emerge as a resource that makes it possible to alleviate many of these technological deficiencies and contribute significantly to the development of specialised digital competences through the creative application of basic knowledge, content and specific competences related to curricular regulations.

Figure 9. Students using DAW platforms in the music classroom

From a pedagogical perspective, it favours the integration in the classroom of current popular music repertoires and a large part of its paradigmatic processes and contexts of creation and production which, as Hoon (2018) points out, allow for the establishment of links between learning and informal musical practice and curricular requirements to promote authentic learning through the representation of varied experiences that amplify musical learning and understanding. In this vein, the perception of the technological element as a centralising agent promotes a shift from an instructivist to a more constructivist pedagogical approach that also favours a shift in the pragmatic domain from teacher-directed to learner-centred activities (Wise, *et al.*, 2011).

These issues are in line with pre-existing studies in which the activities articulated through this type of platforms allow the integration of content, the strengthening of self-confidence in technological competence and the perception of usefulness in the field of professional praxis, both processes and of the products developed. Specifically, and as noted in Thayer *et al.* (2021), the study highlights how this type of intervention makes it possible to meet the different needs of students and integrate different musical styles using innovative, creative, constructive, and multipurpose strategies.

Finally, there is a lack of prior technological skills related to the knowledge and use of applications and resources for recording, editing, and processing audio and, in general, of all types of digital resources related to music education, which are reflected in turn in other studies such as the one proposed by Tejada and Thayer (2020). In it, they highlight the lack of technological skills before the start of the intervention and how this produces insecurity and stress in the face of the challenge of technological performance. This issue necessarily implies addressing the fact that the use of these tools implies a long learning curve (González, & Merchán, 2022), and a familiarisation with certain concepts that must be known and assimilated beforehand. Learning to exploit all the possibilities of DAWs implies a parallel learning process that must be progressive, well-planned, and aligned with the evolution of students in the internalisation of knowledge and competences. Moreover, the implementation of DAWs within educational ecosystems is based on the theoretical assumption that music learning through music production technologies should focus on the process rather than on the result. For this reason, the emphasis is placed on avoiding

placing music production at the centre of music teaching, nor as a resource to replace other teaching methodologies and practices, but rather on placing the focus on its educational projection and raising the possibilities of its application in music teaching classrooms. On the other hand, a high degree of receptiveness on the part of students towards this type of development is observed, highlighting how these enable them to acquire skills and possibilities that they had never thought possible through approaches that are developed with great satisfaction (Tejada, & Thayer, 2020).

7. Conclusions

Digital technologies represent a significant advance and inaugurate a new horizon of perspectives in the field of Music Education with the clear and undeniable objective of making it a more inclusive and creative practice (Merchán, *et al.*, 2023). Specifically, the production and treatment of sound through the so-called DAW platforms in the educational field offers a series of opportunities to implement more meaningful musical teaching-learning processes, fostering the development of creativity through the creation and manipulation of sound material in the digital environment. This research documents and identifies its most relevant areas of action and relates various proposals for application that highlight its didactic potential in the music classroom; its accessibility and flexibility, the promotion of creativity, abstract, critical, and multimodal thinking in students lays the foundations for a methodological renewal for the development and design of LS that favour the acquisition of specific competences in real environments. Within this framework, it becomes clear how DAWs offer a critical response to emerging professional needs, based on new technological possibilities, and transcending the mere translation of teaching/learning processes that took place in the real physical world to the digital world (González, & Merchán, 2022). As March (2006) states, selecting learning and teaching methodologies that favour an approach to professional reality to achieve meaningful, deep, and constructive learning, which allows us to continue learning on a permanent basis, must become one of the central themes in educational research.

To this end, it should be borne in mind that the approaches related to the use of DAWs encourage the acquisition of the technological competences that underpin the teaching/learning process in this context and that, ultimately, allow the wide range of possibilities and functions offered by this resource to be exploited. In this sense, the role of the teacher as a guide in the development of the methodological process is key (Walzer, 2020; 2021) to observe which aspects, require greater attention and to provide students with the optimal support and tools according to their pedagogical needs. From this approach, the use of DAWs in the music classroom can help to enhance motivation and engagement, enjoyment and artistic understanding of the musical phenomenon, critical analysis, and self-confidence, as well as the acquisition of skills related to autonomy, decision-making and problem-solving.

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ARTICLES

'We must eradicate the fear of the differences': Tertiary Spanish students' perceptions about multicultural music

"Debemos erradicar el miedo a las diferencias": percepciones de estudiantes universitarios acerca de la educación musical multicultural

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Abstract

Collaborating across borders in higher education has been shown to have myriad benefits. In this case study, drawing on small group discussions, whole group discussion, and anonymous written student feedback, the authors from different places across the globe explore preservice teacher's perceptions of learning multicultural songs in an online environment. Using thematic analysis, data were coded and analyzed into six overarching themes. Findings indicate students broadened their musical spectrum and developed music knowledge and skills and an understanding about educational models that can enhance the cultivation of a global mindset. While online delivery cannot fully replace face-to-face teaching, the study indicates that the online environment can open up new windows of opportunities for students to engage with cultural bearers around the world in real time.

Key words: Music Education; Multicultural Education; Online learning; Cultural bearer.

Resumen

La colaboración transnacional en la educación superior ha demostrado tener innumerables beneficios. En este estudio de caso, a partir de reflexiones en grupos pequeños, grupos de discusión y comentarios escritos anónimos del alumnado, los autores de diferentes lugares del mundo exploran las percepciones del profesorado en formación sobre el aprendizaje de canciones multiculturales en línea. Utilizando el análisis temático, los datos fueron codificados y analizados en seis categorías. Los resultados indican que el alumnado amplió su espectro musical y desarrolló conocimientos y habilidades musicales, y comprensión de los modelos educativos que pueden mejorar el desarrollo de un pensamiento global. Si bien la educación en línea no puede reemplazar por completo la enseñanza presencial, el estudio indica que el entorno virtual puede abrir nuevas ventanas de oportunidades para que el alumnado interactúe con mediadores culturales de todo el mundo en tiempo real.

Palabras claves: Educación musical; educación multicultural; aprendizaje en línea; mediador cultural.

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1. Introduction

The use of music to enhance cross-cultural understanding is an area of study with a long tradition (Volk, 1993). Specifically, in the field of multicultural music education (Campbell, 2018), different research has analyzed students' and/or teachers' perceptions of the benefits of knowing and participating in multicultural musical experiences (Legette, 2003; Westerlund *et al.*, 2020). Specifically, in the training of future music teachers, Knapp (2012) analyzed the effects of participating in culturally diverse experiences on the perception of authenticity in music and the preference for teaching music from other cultural contexts. Meanwhile, Wong, Pan and Shah's (2016) study concluded that prospective music teachers understand multicultural music education as an important part of elementary education for all people, as it helps to raise awareness of cultural diversity, while promoting improved understanding, tolerance and acceptance of other people. However, both research studies (Knapp, 2012; Wong, *et al.*, 2016) highlight the lack of training and the need to promote and analyze the effects of multicultural music experiences in teacher education. Our study focuses on this field of knowledge.

This paper is based on ongoing research that aims to promote university students' understanding of teaching songs from different countries using technology, while seeking to build a community of practice (Mellizo, *et al.*, 2023; Nethsinghe, *et al.*, 2023). The idea of collaboration and cross-border work is not a new phenomenon, and although it takes time to set up, it has innumerable benefits (Nagar, & Ali, 2003). In this article, we share our collaborative project in which we worked with students of the Primary Education Teaching Degree at the University Jaume I of Castellón, Spain, within the framework of an optional subject in the third year. In this project, the learning of culturally diverse music was promoted to future primary school teachers through four consecutive workshops.

This case study focuses on student voice in relation to their experience of learning new songs, the pedagogical approaches employed, and the transferability of this type of experience to a primary school classroom. The aim of the study was to explore university students' perceptions of learning multicultural songs through a hybrid teaching environment, combining online and face-to-face actions.

The research question that prompted the study was: how does participation in multicultural musical experiences contribute to the intercultural learning of prospective primary school teachers?

It is beyond the scope of this paper to discuss the terms multicultural and intercultural. We use the term multicultural to broadly denote people from diverse cultural backgrounds preserving their cultural heritage, and the term intercultural to refer to the opportunity to build social cohesion and dialogue between people of different ethnicities and cultures (Meer, & Mohood, 2012). The motivation to develop the experience and analyze the effects emerges from the fact that each participating researcher comes from different countries and cultures with different backgrounds. We believe that contact with authentic multicultural educational experiences are elements that can make social and cultural heterogeneity visible and raise awareness. Thus, under certain conditions, they can have a positive impact that promotes real changes towards the construction of an intercultural society (Patiño-Santos, & Rubinstein, 2011). However, some research reports contradictory results on the effects of multicultural music education. Xu (2000) warned that improving perceptions of diversity in the classroom does not

necessarily generate intercultural understanding in wider contexts. McIntosh (1988) identified that students' improved understanding of diversity does not necessarily imply recognition and questioning of their own privilege or social injustices. In this sense, it is necessary to analyze each participant's perceptions of what impacts these kinds of musical practices can have and how they can be transformative.

Student feedback helped us to re-evaluate "what, why and how" we teach in hybrid learning environments. From this experience (synchronous and asynchronous), the *Four Step Flipped Method* emerged. It aims to contribute to the field of research on multicultural music education, specifically by focusing on the possibilities of online learning to promote intercultural understanding and creativity in students.

2. Literature review

2.1. Teaching and learning in virtual environments

Teaching in the online environment requires teachers to engage students to actively participate in the process (Bond, 2020). According to Bryson and Andreas (2020, p.9), the *Learning Management System* (LMS) platform, in our institutions commonly known as the Virtual Classroom, provides a resource bank with material tailored to teaching. In this way, real-time online encounters are intended to replace face-to-face teaching in the classroom. Teaching in the virtual space also means developing quality content for active student participation (Kamal, & Illiyan, 2021). Along with the preparation of content, there are teachers who express negative perceptions towards some aspect of online teaching, such as the work overload involved or the preconception that certain learning is diminished compared to face-to-face teaching (Iglesias-Calonge, & Rivera-Pino, 2021). In turn, there are numerous technical challenges related to poor network connectivity, time delays or inaudibility (Zamarro, *et al.*, 2022).

One of the biggest challenges of the online environment has to do with teacher presence. Some researchers point to three important 'presence components' (social, cognitive and didactic) that contribute to fulfilling learning intentions when teaching in the virtual space (Garrison, *et al.*, 2010). In relation to music education, a recent study (Berrón-Ruiz, *et al.*, 2023) analyses the perceptions of future music teachers regarding the use of technologies for instrumental training, showing aspects that students value as positive elements in the use of these technologies in learning. In turn, Merrick and Joseph (2023), in Australia, indicate that the inclusion of videos and audio recordings helps to improve their online teaching. While there are many models of teaching (Johnson, 2020), in the present study, what began as an expert-centered approach (cultural mediator) culminated in the learners' own interpretations. It sought to promote experiential learning aimed at developing cognitive learning through play and creativity (Johnson, 2020). The virtual environment creates opportunities for students and teachers to experience unfamiliar cultures through authentic learning episodes. In this case, songs from different countries were used to promote intercultural understanding and the development of cultural awareness (Achieng Andang, 2020).

2.2. Intercultural experiences in music teacher education

Over the past several decades, music teacher education programmes around the world have recognized the growing need to diversify curricula and have made significant changes in both content and pedagogy (Westerlund, *et al.*, 2021). The inclusion of repertoires and pedagogical practices from folk, popular and global traditions in teacher education alters the dominant paradigm of Western classical music, which is sometimes seen as exclusionary and elitist (Allsup, 2016). Music teacher educators in many parts of the world are exploring culturally responsive teaching strategies to connect with university students in their classrooms (Lind, & McCoy, 2016). In addition, they are forming cross-cultural collaborative networks that generate new perspectives and stimulate reflexivity (Westerlund, *et al.*, 2021). Within these networks, music teacher educators work together to provide university students with opportunities to learn not only about, but also from and with others in unfamiliar cultural settings (Westerlund, *et al.*, 2022). Researchers have found that these intercultural projects (in both face-to-face and virtual settings) can challenge prospective teachers' assumptions, attitudes and preconceived beliefs (Gibson, 2021; Lee, & Markey, 2014) about what music education should be like, to help them develop tools and strategies to navigate unfamiliar situations and promote higher levels of intercultural understanding.

3. Context and pedagogy for an online teaching and learning experience

This experience was developed in a course called "Instrumental Ensembles", which aims to influence the pedagogy of instrumental training. In the effort to include a wide range of musical contexts, styles and forms, the promotion of multicultural musical learning is ensured through the inclusion of repertoire and pedagogical practices from local and global traditions. To this end, a series of online music sessions were delivered by Rohan, Dawn and Jennifer, who acted as cultural mediators (Campbell, 2018). Each presenter facilitated a workshop on music from their own land: Rohan taught a Sri Lankan children's song (*Rosa Male Natuwe*), Dawn a South African lullaby (*Thula Thu'*) and Jennifer a traditional song originating in the United States (*This Land is Your Land*) (Joseph, *et al.*, 2021). Finally, the students had the opportunity to participate in a final three-hour face-to-face session facilitated by Alberto and Jennifer, in which they performed in groups and freely covered the songs they had learnt in the previous workshops.

The authors used a four-step inverted pedagogical approach [(1) Asynchronous; (2) Synchronous; (3) Face-to-face and (4) Hybrid feedback]. This includes the flipped classroom approach (FLN, 2014), distance learning techniques (Koutsoupidou, 2014) and Technological Pedagogical Knowledge (TPACK) (Koehler, *et al.*, 2013), including multicultural or culturally specific music teaching methods. In the following, each of the steps of the method used is described:

1. Asynchronous: each facilitator prepared and provided relevant teaching and learning material to Alberto, who shared it with the learners via the LMS prior to the workshop. Each facilitator explained the content to Alberto so that he could respond to his learners' queries. Alberto also conducted pre-workshop preparation sessions to contextualize the experience. Setting the learning as a pre-task was consistent with the flipped classroom approach.
2. Synchronous: for three weeks, each cultural mediator facilitated his or her workshop separately online. The workshops were conducted with the help of Alberto translating into Spanish when necessary. During each workshop, students received formative feedback to improve their knowledge, understanding and skills. On a weekly basis, students reflected on different aspects in each of the workshops. These reflections are part of the data that informs our results.
3. Face-to-face: Alberto and Jennifer held an intensive workshop to give students the opportunity to rehearse and perform the three songs they had learned. They worked with their peers to cover the original songs, created lyrics and recorded the final result. The recordings of each song were shared with the facilitators to allow for informal evaluation.
4. Hybrid feedback: in the final session (week 5), Alberto provided final reflections and conclusions about the experience and each facilitator gave feedback on recordings of their performances (Jennifer in person, Rohan and Dawn online).

4. Methodology

Our study uses a qualitative approach of a descriptive nature. The research explains and interprets our observations (field notes) and students' comments (Cohen, & Manion, 1994). This case study is a useful way to describe an intervention or phenomenon that occurred in a real context (Yin, 2014). Baxter and Jack (2008) point out that there is no right way to report a case study, but state that the researcher should describe the context within which the phenomenon occurs, as well as the phenomenon itself, by telling a story or providing a chronological account.

4.1. Participants

The study included 30 students (18 males and 12 females). There were participants (13) who had formal or informal musical knowledge and most of them could play a musical instrument (piano, guitar, violin, cello, oboe or drums). The other group of students (17) had only musical knowledge learnt during Primary and Compulsory Secondary Education and did not know how to play any instrument other than school instruments (Orff instruments, recorder, etc.).

4.2. Collection of information

Data collection was carried out in four stages. First, at the end of each online workshop, students were divided into small groups of 4 or 5 people and participated in an audio-recorded online discussion about the experience. To promote this conversation, a series of open questions were asked about their previous multicultural experiences, their perceptions of the activity (positive and negative aspects), elements of the experience that could later be applied to a primary school classroom, the value of the cultural mediator in these experiences or their perceptions of

cultural diversity and its management in educational contexts. These recordings were subsequently transcribed. Secondly, at the end of the face-to-face session in which the songs were covered and performed, a group discussion was held with all the students. With the necessary permissions, both the workshop and the discussion group were videotaped. The focus group videotapes were later transcribed. Thirdly, the students' comments from the anonymous subject evaluations were collected. Finally, each facilitator took notes from their presentation and virtual meetings that informed the narrative in the discussion.

4.3. Data analysis

The authors independently read the student data and viewed the videos that were securely stored in virtual environments. We employed thematic analysis (TA) as a method suitable for critically reading the complex phenomena of our participants' subjective lived experiences (Jackson, & Nowell, 2021). Willig (2017) points out that thematic analysis is a method of analysis that helps the researcher to identify patterns in the data. By re-reading the data independently, we gained familiarity with the data, which allowed us to develop emerging codes and themes (McGlinchey, *et al.*, 2021), qualitative in nature in both theoretical and procedural orientation (Braun, & Clarke, 2019). We initially familiarized ourselves with the student data and independently read and re-read the data using keywords in the margin to generate initial codes. We met several times via videoconference to discuss and revise our initial codes. The data were initially coded into two main sections: workshop data and anonymous evaluation data. The online workshop comments were coded as group reflection data (GR) and the face-to-face workshops as group discussions (DG). The anonymous student evaluation of the unit was coded as AE.

Finally, six categories of analysis emerged: (1) student experience, (2) aspects learned, (3) ways of learning and teaching, (4) applicability to Primary Education, (5) cultural diversity and (6) online learning. The results are organized into these categories (Xu, & Zammit, 2020). The main codes and categories are included in Table 1:

Table 1. Codes and categories

Experience	Aspects learned	Ways of learning and teaching	Applicability to Primary Education	Cultural diversity	Online learning
Prior knowledge	Musical aspects	Flexibility	Inclusive education	Empathy	Advantages
Meaningful learning	Social aspects	Obligations	Transferability	Acknowledgement	Disadvantages
Satisfaction		Responsibility	Professional development	Critical thinking towards diversity	
Positive aspects		Support	Sustainability	Communication with others	
Negative aspects		Teamwork		Cultural aspects	
Integral development		Critical thinking towards pedagogical approaches		Political aspects	
Personal transformation		Communication aspects		Identity	
		Creativity			
		Requirement			

In this way, we established a common thread between the exploratory intention of our study, its theoretical foundation and its data analysis procedure (Trainor, & Bundon, 2021).

5. Results

In this section we share some of the students' comments organized thematically. We use direct quotes from students to inform our findings and indicate the source of the information.

5.1. Experience

Table 2 shows the comments related to the students' perception of how they felt during the experience. They refer to aspects such as comparison with other teaching experiences they have had, highlighting why they think the experience was beneficial for them, or how they felt during the sessions.

Table 2. Comments on the experience

"This experience has helped us to form perceptions, it has been very useful for our future. We are not used to something like this, especially not at university, because until now we had not had any experience with other cultures in any subject. It has been very rewarding.	GR
"The experience helps us to get to know new music that we may never have heard before in other circumstances".	GR
"This experience has also helped us realise that we don't really know the authentic or traditional music of the United States, and we only know more commercial songs and music.	GR
"I thought I was going to be embarrassed to play in front of other people, but I wasn't. I don't normally play in front of anyone, and here I did.	DG
"I wouldn't change anything about this experience. I think the jam session was the best time I've had in class all year".	DG
"The intercultural sessions have been a very enriching learning experience that has helped me to open my mind and learn new music".	AE

5.2. Aspects learned

In this category (Table 3), we selected the comments that related the experience not only to the musical contents and practices learned, but also to some aspects related to pedagogies and learning strategies. In addition, students reported some attitudinal learning that went beyond musical knowledge.

Table 3. Comments on the aspects learnt

"We work on the originality of the lyrics, creativity, the tonality of the songs, the instrumental accompaniment and the memorization of the lyrics and melody".	GR
"For us, above all, it was the improvisation aspect: we learned the originality and creativity of the new lyrics".	GR
"The fact of covering songs or performing them, being able to introduce improvised elements, such as varying the melody or creating rhythms, can be very useful for working on rhythmic, melodic and harmonic aspects".	GR
"The experience raises awareness again of the importance of knowing how to communicate in different languages, and also of showing our pupils, from a very young age, that it is important to learn other languages".	GR
"I thought singing was going to be easier, but it was very complicated. In fact, on the second song I changed to play the cowbell".	DG

5.3. Ways of learning and teaching

Students referred to certain strategies, attitudes and pedagogies employed by the workshop facilitators. They highlighted the teaching aspects of the workshops given by Dawn, Rohan and Jennifer that were most meaningful to them. They also talked about how the face-to-face session flowed and how they felt they learned from it (Table 4).

Table 4. Comments on ways of learning and teaching

"We enjoyed contributing in class, creating our own version of the song and feeling part of the experience, getting closer to this music and culture".	GR
"It was quite a dynamic session despite being online, with a touch of humour at times which helped to make it more enjoyable".	GR
"You can tell that she [Dawn] is very happy with what she does, that it's pure vocation and she conveyed all the positivity that she was showing in the session. We felt like she really enjoyed what she was doing and made it very enjoyable, to be honest."	GR
"The methodology Jennifer has used to teach music is very interesting. She has worked on both historical and musical concepts based on a song".	GR
Student 1: "It was a very fun experience. We learned by repetition and imitation (I was imitating Miguel... hahaha)". Student 2: "[we learned] by discovering". Student 3: "We improvised". Student 4: "At the end we worked on a bit of everything". Student 5: "We worked in groups"	DG

5.4. Applicability to Primary Education

After the sessions, students were asked to reflect on the transferability of the experience to a primary classroom. As reflection is an important aspect of their future professional life, Table 5 highlights the students' beliefs about the applicability of the experience to a primary school.

Table 5. Comments on applicability to Primary Education

"To develop students' critical thinking skills, we can use the activity we did. It involved writing the lyrics of a typical Sri Lankan song. With this, the children will have to be creative, they will have to think about the lyrics and also adapt them to match the melody".	GR
"The use of the *Cotidiaphone* has been very interesting, because it teaches the pupils that music can be found in any object that is within our reach, whether by hitting, blowing or tapping, a sound can be created through it".	GR
"It is important to use traditional and popular songs from our culture and others, teaching them something about the sociology and history of our country and other countries where our students come from. We can start by explaining the history of the culture, the origin of our musical roots... include images of our instrumental variety, YouTube videos of dances, festivals and even instruments. We can involve students by playing popular songs from each country or culture we have in the classroom".	GR
"Making homemade instruments and including songs from other cultures. Use strategies for teaching a song: first the rhythm, then the melody, solfège, melody, lyrics and harmony. In other words, do not teach everything at once, but teach by musical phrases and then little by little".	GR
"A good method is the *World Music Pedagogy* that Jennifer taught us".	GR
"This is a very different way of teaching children. I could definitely see myself doing one of these songs in a future primary classroom".	DG
"Intercultural sessions are a good project to introduce pupils to discovering new cultures and getting them interested in this topic. This is a type of activity I would do every year".	AE

5.5. Cultural diversity

Table 6 highlights students' reflections on the impact of educational experiences to enhance cultural understanding and to promote social cohesion in diverse societies. They highlight the importance of inclusion and cultural diversity in their lives and in their future classrooms.

Table 6. Comments on cultural diversity

"Cultural diversity favours or enhances coexistence with society and fosters respect. Learning about other cultures can be very enriching. As teachers, we must set an example to our students of the different types of cultures that exist and the values that must be adopted in order to be able to live together in society".	GR
"We have learned that we know very little about multicultural education. We have learned that despite being in the 21st century and being in a very culturally interconnected world, we are not educated or we do not educate in a multicultural way, which is a mistake because there is more and more cultural diversity in classrooms and in all countries. Despite this, we have realised that, although there are many different types of cultures, music is very intercultural and is taught in the same way everywhere".	GR
"We must eradicate the fear of differences. We cannot educate for equality if we continue to perpetuate racist ideologies of any kind, so we need to be well informed about any form of culture".	GR
"We have learned that there is a lot more to it than the stereotypes of American country and folk".	GR
"We value having had a mediator. A person who is from a certain place will always explain better where they come from than a person who is not from that place. Dawn has told us about her country. This reaches us much more than other activities such as, for example, having done a research project on South African music; because she tells us in a more intimate, more personal way, and conveys the affection she has for her homeland. This would not have been generated in any other way. Moreover, having a person from another place come and explain things about their country or their city is much more attractive and motivates the students to listen and learn about it, about what that person wants to transmit to us".	GR

5.6. Online learning

Finally, we categorized the students' responses in relation to the e-learning experience. They reported positive and negative aspects, and shed light on possible strategies for teaching online.

Table 7. Feedback on the online teaching and learning process

"The positive thing about being online is that we learn in a different way, we have more possibilities to learn with people from other countries and have them explain practices or musical content to us. A positive aspect is that it is not necessary to bring instruments or any kind of material to the classroom, it is much more comfortable to do it from home. The negative aspects of online teaching are that it does not encourage interaction, sometimes it becomes boring. Sound quality is lost and, in general, students' motivation decreases. Many teachers do not facilitate learning as teaching is given in a much more traditional and magisterial way and, in addition, learning processes are slower".	GR
"In class everything is more participatory. It's always good to be corrected and to see your mistakes face to face, to see examples. On the net we lose human contact, it doesn't help us to advance, or not at the speed we would in the classroom".	GR
"Online learning makes teamwork very difficult".	GR
"It was very difficult for me to understand the session. I don't speak English very well and the internet doesn't help in this regard. When I was working with Jennifer, in person, I can understand what she means. But online, you are all the time in front of the same screen and you are easily disconnected from the session. The language was a barrier, but if you are in the session, you can easily stop and ask questions, or ask Alberto to translate if you don't understand something. But you don't do this as much in an online class".	DG

6. Discussion

The online teaching experience cannot completely replace the face-to-face teaching model. Music education is particularly sensitive to this aspect (Shaw, & Mayo, 2021). The *Four Step Flipped Method* (Nethsinghe, *et al.*, 2023) proved to be a useful educational approach to generate learning situations that enable students to develop knowledge and skills related to music learning and educational models concerned with inclusion and that foster the cultivation of a global mindset in students (Mellizo, & Cabedo-Mas, 2022).

Students highlight as beneficial the incorporation of cultural mediators, who can speak from an informed perspective and contextualise history, society, traditions and cultural forms – including music– providing authentic educational experiences (Schippers, 2006). The inclusion of cultural mediators enhances respect and recognition of certain cultural practices (Burnim, 1985), which are perceived as new knowledge received from an authoritative voice (Nettl, 1964). This should be combined with a range of pedagogical strategies that facilitate the acquisition of positive experiences in the music classroom (Lee, 2013).

The application of appropriate methodologies for teaching and learning music from local and global traditions is important (Anderson, & Campbell, 2010). This involves helping students to experience contextualized music practice, to observe and understand different ways of structuring sessions and, at the same time, to reflect on the possibilities of applying certain experiences to their professional future. All of these are necessary elements to create an educational environment that overcomes possible barriers promoted by the lack of confidence that some students have when singing and/or playing an instrument, or creating music in front of their peers (Thorn, & Brasche, 2015).

We agree with Gravett *et al.* (2011), that it does not matter how well simulated experiences are designed and executed at university, or how often students 'experience' and spend time on practical work in schools. The reality sinks in when they are responsible for students in their own classrooms (Snow *et al.*, 2005). However, the data show students are interested in learning about new and different music, especially when they understand and are able to apply appropriate methodologies and pedagogical strategies. This allows them to contextualize what is to be transmitted. Students grasp the sequencing of pedagogical methods and the inclusion of useful resources. This opened up new ways of thinking about the use of authentic musical instruments, including the use of resources that teachers have at their disposal, or that can be created from everyday materials (Rodríguez-Lorenzo, 2017).

The current reality of our classrooms is undoubtedly diverse and cultural inclusion is an important aspect that needs to be addressed in curricula and teaching practices. Despite reporting that initial training has not provided them with sufficient experiences in which to experience cultural diversity and reflect on its importance and learn strategies for its management, students identify a growing need to diversify curricula, content and pedagogies (Westerlund, *et al.*, 2021). Contact with the cultural mediator helps to reduce stereotypes, eliminate fear of difference and create a sense of respect. At the same time, students can experience and value teamwork, the importance of teacher networking and the need to collaborate (Westerlund, *et al.*, 2022), both in their initial training and in their subsequent professional practice.

In this study, students valued the online environment as a way to open new windows of opportunity to interact with cultural mediators in real time (Nethsinghe, *et al.*, 2023). While there are myriad benefits and disadvantages of online teaching and learning, the authors point to the *Four Step Flipped Method* as a possible model for delivering transnational collaborative teaching in hybrid environments. Some of the difficulties of online learning reported included the difficulty of delivering dynamic sessions, the advantages of sharing space with faculty (Nage-Sibande, & Morolong, 2018), the difficulties of teaching in other languages and, for some students, internet connectivity. In the combination of online and face-to-face experiences, the host teacher has an important role to play in maintaining the flow of conversation and providing a positive learning environment (Ng, *et al.*, 2022).

7. Conclusions

In exploring prospective teachers' perceptions of multicultural song learning through an online teaching environment, we recognize that this brief experience can be considered a sample and was not sufficiently sustained to confront and challenge musical ideas, processes and social changes. We took a risk with the expectation that the workshops would be well received by the students, as we had the support of the host teacher, Alberto. Since some of the authors (Rohan, Dawn and Jennifer) were not aware of the students' assumptions, attitudes and preconceived beliefs, we did not always anticipate pedagogical aspects and strategies to create a more effective learning space, such as actions to improve attention, communication or encourage participation.

In answering the question of whether multicultural songs can contribute to students' intercultural learning, we conclude that it is possible to do so through the online environment. Depending on the pedagogy and the facilitator, we find that students can acquire new understandings and perspectives on music and culture from different lands in a short period of time. We recognize that processes that impact personal aspects such as preconceptions or values, and on social aspects, require sustained time for action and reflection (Emmanuel, 2005). At the same time, we understand that knowing diversity does not necessarily imply reducing inequality (McIntosh, 1988). However, we consider that any action that promotes the improvement of intercultural understanding has to start from an interaction based on an open and respectful attitude towards new knowledge. We insist on the value of collaboration with cultural mediators in learning new music (Bond, 2017).

Online teaching had its disadvantages, as Rohan, Dawn and Jennifer were unable to establish a relationship with the students. The online environment removes the sense of teacher presence. As facilitators, we relied heavily on Alberto to translate and monitor student learning. The students felt that they had less connection with the facilitators in the online space than in the face-to-face sessions. This study therefore highlights the importance of close collaboration and fluid communication between teachers and cultural mediators, especially when working in hybrid environments. It was reflection on these issues that gave rise to the *Four Step Flipped Method*.

From our study, we recommend fostering local and international collaboration between cultural mediators and music educators in all teaching settings to promote intercultural understanding. The research provides notable implications for higher education professionals preparing teacher trainees to be culturally responsive teachers. The results indicate the willingness and openness of students and teachers to participate in the hybrid initiative. Our intention was to allow conversations to emerge in order to think beyond familiarity with non-Western music, and

to tap into the creativity of the students. Such intercultural learning experiences can serve as 'awakenings' that allow future teachers to see their professional work from multiple perspectives (Westerlund, *et al.*, 2022, p.392) and challenge their preconceived notions of what music is and what music education should be.

International networks and collaborations make it possible to access the figure of the cultural mediator. To counteract some of the limitations that cultural mediators imply (Bolden, & O'Farrell, 2019; Vaugeois, 2009), especially when there are language barriers, we suggest three elements that facilitators should focus on. First, providing the correct contextualization and a rationale for the importance, significance and transferability of the action to be developed. Second, the process needs to be accompanied in a way that is respectful and, at the same time, attentive to the needs and interests of the learners. Thirdly, the need and importance of a final reflection process that facilitates the evaluation of the experience, linking it to the learning obtained, both in terms of knowledge, skills and attitudes, and discussing strategies for its transferability and application to other contexts.

This study allowed us to reflect on our teaching practice and gave us the opportunity to collaborate in online teaching processes and obtain feedback from students, identifying the strengths and weaknesses of the experience and also of the *Four Step Flipped Method* as a way of facilitating multicultural music experiences. In a recent study, Westerlund, Kallio and Karlsen (2022, p.381) identify that there is a lack of opportunities not only for prospective music teachers but also for their teachers to learn from each other and form learning communities at institutional level that promote, among others, the development of intercultural competence. We agree with one student's comment that calls for "eradicating the fear of differences" and adopting new ways of fostering multicultural music practice. While this is a stimulating field of research, this research opens up new possibilities for further studies in the field of multicultural music education.

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ARTICLES

Exploring music and sound in multimodal literacy: A systematic review and its implications for music education

Explorando la música y el sonido en la alfabetización multimodal: una revisión sistemática y sus implicaciones para la educación musical

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Abstract

Multimodal literacy involves using multiple communication modes in text comprehension and production. This review examines sound and music in research on multimodal literacy, analyzing 48 pieces from Web of Science and Scopus databases. It identifies common methods and educational aspects in the texts and explores how multimodal literacy is applied in academic settings, focusing on the implications that it may have for music education. The study highlights the versatility of the aural mode, encompassing sound effects, vocalizations, music, and more. However, some studies merely use sound as "background music" without considering its communicative role. This research contributes to understanding sound's implications and its potential in engaging students in a multimodal society.

Key words: Multiple Literacies; Sound; Music; Education.

Resumen

La alfabetización multimodal implica el uso de múltiples modos de comunicación en la comprensión y producción de textos. Esta revisión examina el sonido y la música en la investigación sobre alfabetización multimodal, analizando 48 trabajos de las bases de datos Web of Science y Scopus. Identifica métodos y aspectos educativos comunes en los textos y explora cómo se aplica la alfabetización multimodal en entornos educativos, poniendo el foco en las implicaciones que esto pudiera tener para la educación musical. El estudio destaca la versatilidad del modo auditivo, que abarca efectos sonoros, vocalizaciones, música y otros. Sin embargo, algunos estudios limitan el uso del sonido a la "música de fondo", sin profundizar demasiado en su función comunicativa. Esta investigación contribuye a comprender las implicaciones del sonido y su potencial para implicar a los alumnos en una sociedad multimodal.

Palabras claves: alfabetización; sonido; música; educación.

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1. Introduction

We are in a time of constant change, especially in the field of education. The shift from pencil and paper to screens, the emergence of Recurrent Neural Networks for text generation (such as ChatGPT), or the proliferation of media such as audiobooks, social networks, video game chats and streaming platforms or forums, are events that lead us to rethink what types of language should be taught in educational institutions (Domingo, *et al.,* 2015; Marsh, 2004). The European Literacy Policy Network (ELINET) already recognizes that literacy should include digital media drawing on multimodal skills and knowledge, such as visual and auditory information production (Valtin, *et al.,* 2016). In the last 40 years, studies have emerged that define literacy as a socio-cultural practice, conceptualizing literacy as embedded in society and built upon vernacular practices, whether analogue or digital (Street, 1985; 2011). Thus, there is a degree of agreement within the research community that literacy research does not only involve identifying the psychological processes that take place within the individual which underpin reading and writing (Bloome, & Green, 2015) but also requires recognition of all those processes in which decoding occurs and through which meaning is created (Gillen, & Hall, 2013).

Changes in ICT and the emergence of new literacy theories pose significant challenges in translating these concepts into the classroom. According to Bazalgette and Buckingham (2013), terms such as "multimedia", "digital" or "multimodal" literacy are used as "hooks" for advertising purposes, without having real applications in practice. Furthermore, they propose that teachers feel alienated from students' textual practices owing to changes in communication technologies, which hinders the teaching-learning process. There are also difficulties when it comes to materializing multimodal literacy approaches in the classroom, as they are built on varied definitions of literacy (Nash, 2018). One challenge for teachers is assessing how successful their approaches to multimodal literacy are since, according to Anderson and Kachorsky (2019), teachers often use "high-stakes forms of summative assessments" (p.313) which are not aligned with ideological models of literacy. Moreover, designing and implementing educational strategies that address different forms of communication can lead teachers to a situation of uncertainty, so a certain level of training and specialisation is necessary (Kuby, *et al.,* 2015).

These difficulties are exacerbated when working with code systems that include sound. Owing to the immaterial and abstract properties of sound and music, these "are not considered as powerful conveyors of meaning and are not used to teach communication skills" (Rowsell, 2013, p.148). According to Shanahan (2012), sound is generally used as a "decoration" within the literacy framework in the classroom, without delving into its communicative capabilities. Shanahan argues that, despite its recognition as a mode of communication, there is a lack of research into the analysis of sound and its implications for a message. Technological changes and the permeability of the boundaries between sound, music and other forms of communication make it difficult to use and analyze the semiotics of the aural (van Leeuwen, 1999). As we are constantly surrounded by sounds, it is essential to know the aural contexts that surround pupils, as well as the codes that are used in them and how they influence the meaning-making processes that take place in childhood (Petchauer, 2020).

Other authors have performed literature reviews about multimodality at school settings. Aforementioned Anderson and Kachorsky (2019) carried out accurate research about the different methods used to assess multimodal proposals. On the other hand, Lim, Toh and Nguyen (2022)

examined the existing literature about multimodality at the English teaching context. With the intention of shedding light on the possibilities of sound and music within the new conceptualizations of literacy, as they haven't been explored by other authors, the present systematic review was undertaken. To this end, we set out the following research objectives:

- Describe the main characteristics of the studies that make up the scientific corpus of multimodal literacy, both in the academic and educational fields.
- Review and evaluate the semiotic implications of sound and music in the multimodal paradigm addressed by these studies.
- Collate the findings and possible improvements from the sample studied for the purpose of defining a possible line of evolution for the field of multimodal literacy studies that include sound elements.

1.2. Multimodal Literacy and Sound

Literacy is an active process of meaning-making through which the world is recognized (Street, 2011). Thus, literacy is influenced by the way new technologies conceive literacy practices and is therefore multimodal (Rowsell, & Walsh, 2011). The multimodal property of literacy is that communicators create meaning through different types of modes (Flewitt, 2013). Modes are systems of codes that achieve an effect in communicational processes (image, gesture, sound, movement, etc.). The modes used in communication directly affect the message, even interacting with each other in different ways (Kress, 2010). Communication then "occurs through the combination of juxtaposed sign systems to create a more powerful effect" (Crafton, *et al.,* 2009, p.34). Thus, modes are selected and redesigned to shape the meaning conveyed in any social and cultural medium (Tomlinson, 2015). According to Kress (2010), a mode is a semiotic resource used to make meaning. A mode is also defined by social needs of communication. For example, a graphic designer will choose a particular typeface depending on their needs and knowledge of what a particular community understands in relation to conventional practices about typefaces (Bezemer, & Kress, 2008).

Multimodal literacy opens the door to children's critical awareness, and numerous studies use the multimodal perspective to incorporate learners' contexts, recognizing the social meaning of literacy practice (Simpson, & Walsh, 2015). At times, this multimodal perspective carries an implicit artistic view of the communicative act that engages teachers and learners in deconstructing traditional discourses and assists them in creating new codes (Binder, & Kostopoulos, 2011). Pahl (2019) proposes that through the inclusion and study of artistic elements in communication, elements that bring the language of learners closer to educational system are recognised. The development of multimodal literacy skills is crucial in collectives that construct their identity through oral language and elements such as styles of music, forms of dress, or visual artistic manifestations such as graffiti (Mills, & Unsworth, 2018). It is necessary to recognize that learners naturally make complex use of different modes in order to include the communicative context of learners in the literacy processes that take place within the classroom (Harrop-Allin, 2017). One of the strategies that can assist learners in reflecting on these resources is "remediation". Remediation is the adaptation of a message from one mode to another, recognizing how this change affects meaning (Alexander *et al.,* 2016). This remediation offers opportunities to build connections between different domains that make different literacies holistic and meaningful (DePalma, 2015). Morera *et al.,* (2020) proposed an interesting example of

remediation when moved from conventional choral music towards polyphonic sign language in pursuit of inclusion.

Working with multimodal elements makes it possible to describe, explain and explore how semiotic resources can offer more options and tools for the production and interpretation of meaningful actions (Kress, 2010). Van Leeuwen (1999) worked on describing the semiotic possibilities of sound (musical and non-musical), dividing them into six domains:

1. Sound perspective: involves the spatial relationship between sender and receiver and distinguishes positioning and direction, allowing the creation of a soundscape, as well as immersion in it. It distinguishes the intimate (close, like a whisper) from the informal (medium, relaxed) and the formal (louder, a projected message to the public).
2. Time and rhythm: time can be free or adjusted to a measure, thus defining rhythm. We can find simple rhythms or polyrhythms in both musical and textual discourse. Metrical patterns, such as beats, have a meaning, but so does the lack of organised structures.
3. Interaction of voices: allows the sequencing of sound and the set of semiotic meanings derived from each of them (hierarchy, segregation, complementarity, heterogeneity, etc.).
4. Melody: the pitch and its alterations communicate meanings, but also continuity, range, articulation, etc.
5. Vocal quality and timbre: timbre is multidimensional. Each sound is a mixture of different characteristics. A voice is high-pitched or low-pitched, or soft or intense. To describe timbre, it is necessary to go beyond adjectives (metallic, shrill, hollow) and consider the physical sound, i.e., as it is materially produced.
6. Modality: lies in sound's capacity for representation. The term modality refers to the degree of "truth" assigned to a sound event. This means that some sound events are understood as "less true" than others depending on the "modal judgement" of the listener, based on its aural representations of different ideas. Modality is based on the criterion of similarity: the more the sound resembles how it should sound if the represented event were present, the higher its modality.

The categorization of sound's communicative potential holds significant value in the evaluation of the semiotic roles played by aural semiotic resources in the context of multimodal literacy practices. It might be possible to learn more about the implications of sound in the relationships established between subject, signifiers, and meaning (Nowak, & Bennett, 2014). In fact, some authors go further in the conceptualization of sound and its connection with other modes or disciplines. Powell and Somerville (2020), for example, analyze children's sound experience from an ontological approach, considering sound and music inextricably linked with movement and place. Conceptualizing sound as a sensory experience leads to challenge the relation signifier-signified relation and to recognize the complexity of musical interactions, specifically in early ages of childhood (Hackett, & Somerville, 2017).

2. Method

In order to explore the extent to which and in what ways sound is considered by authors within multimodal literacy approaches, a systematic review was conducted. We adopted the PRISMA approach, given its usefulness and the low risk of bias (Shamseer, *et al.,* 2015; Page, *et al.*, 2021). PRISMA is an approach to systematic review that enhances the rigor and reliability of evidence-based research by establishing four steps in the review process: Identification, Screening, Eligibility and Inclusion. However, slight modifications were made to some of the tools it proposes, with the intention of fine tuning the search and reducing bias. For example, the method of inclusion of publications has been adapted to the sample, as we did not use a checklist but a peer review system through which three co-authors validated the inclusion or exclusion of all sample elements.

2.1. Review process

Firstly, a search was conducted of the Scopus and Web of Science (WoS) databases. English descriptors were used to give the research an international scope and the search was confined to the period 2012 to 2023 (inclusive) to ensure that the findings were up to date. The following search terms were used in the title, abstract and keywords: "multimodal", "literacy" and "sound" or "music" as well as related terms, such as plurals or multimodality. The Boolean Operator used was "AND" to ensure the presence of the three descriptors in every publication, with the exception of the terms "sound" and "music", for which "OR" was used. Finally, we decided to include book chapters in the review, providing they belonged to books published by publishers catalogued within the SPI (Scholarly Publishers Indicators). There is a large corpus published in this format and it has been considered that it enriches the review.

A total of 252 titles were identified, of which 75 were duplicates, leaving 177 publications. An abstract and keyword query was carried out on these. A selection process was then carried out, excluding a total of 56 articles because they did not meet one of the following criteria: written in English or Spanish (n=13), addressing literacy from the field of communication or education (n=19), being a journal article or a book chapter (n=8), or allowing access to the document (n=16).

During the next phase, the full text of the remaining publications (n=121) was checked, and a final selection process was established. Numerous publications were found that did not present results related to sound or music within the paradigm of multimodal literacy. In many cases, the terms “sound” or “music” appeared only in the definition of the concept of multimodality but were not included in the study itself. Thus, publications were excluded if they did not go in depth into the auditory mode or its relationship with other modes, or if they did not have sufficient data to be able to analyze the use of sound within the study. Publications that did not include multimodal literacy experiences within an educational setting were also excluded during this phase. Literature reviews and multimodal analyses of phenomena that were not framed within educational practices were thus discarded. In this last screening, a total of 73 publications were excluded, resulting in a final sample of 48, 44 articles and four book chapters. We performed an extra search to get some data about the presence of music and sound in the wide corpus of multimodal literacy. The same databases were consulted, using the same Boolean Operators but

omitting the descriptors "sound" OR "music". Knowing that this number would be reduced after a first review, we obtained a total of 1911 results in WOS and 1858 in SCOPUS.

To assist with the analysis, we created a table based on the SPIDER tool (Sample, Phenomenon of Interest, Design, Evaluation, Research type), which is useful for synthesizing data from qualitative studies (Cooke, *et al.,* 2012). The data collected during the reading of the articles are itemized in the Supplementary Table and were classified into the following categories:

- Author and year of publication.
- Type of study in terms of design (action research, case studies, comparative studies, ethnographic studies, etc.).
- Educational stage at which the study was aimed.
- Subject or area of knowledge in which the proposal was framed.
- Role of the student body or study sample.
- Modes of communication involved in the multimodal proposal (aural, verbal, visual, gestural, haptic, etc.).
- Sound elements that materialize the auditory mode: sound effects, music, dialogue, narration, etc.
- Approach to meta-linguistic issues.
- Access to the material.
- Sound domains recognized.

As prior research exists about semiotic implications of sound, we will use a directed approach of content analysis (Hsieh, & Shannon, 2005). Thus, sound domains described by van Leeuwen (1999) will be defined as categories that will be used to analyze the content of the articles and chapters included in the sample. Directed approach in content analysis helps to make the review process more structure and to extend and support the existing theory (Hsieh, & Shannon, 2005).

3. Results

Regarding the year of publication of the papers in the sample, we found the highest frequency in 2017 and 2021, with a total of 7 articles published in each of those years. The fewest publications were found in 2012 (n=1), and 2013 (n=0) (Figure 1). The average number of articles published per year was 4. Many of the articles used similar research designs. We found a significant number that can be classified as "action research" (n=32) and an increasing trend from year 2016 onward. We understand "action research" to mean those studies whose objective is curriculum development or the improvement of educational programmes, in addition to the objectives derived from the research practice itself (Latorre, 2005). Also important, although not as numerous, was the presence of work with an ethnographic character, specially from 2017 to 2021, in which the researcher studied the literacy practices of a community or group (n=12). Some of these ethnographic works were carried out outside the school premises, for example, those starred by a group of young Cuban artists (Butler, *et al.,* 2021), a Filipino community living in the UK (Domingo, 2012), or even the relatives of the researchers who uses autoethnography to assess their multimodal practices (Narey, 2019). Finally, we found one comparative study between different creators of multimodal productions with a series of common criteria (Smith, *et al.,* 2017) and three articles that could be categorized as "case studies" since they involved a detailed observation and in-depth analysis of a specific phenomenon, attempting to analyze all

the factors that influence it (Yin, 2018). It should be noted that all the articles reviewed used data collection instruments and analysis tools typical of a qualitative methodology.

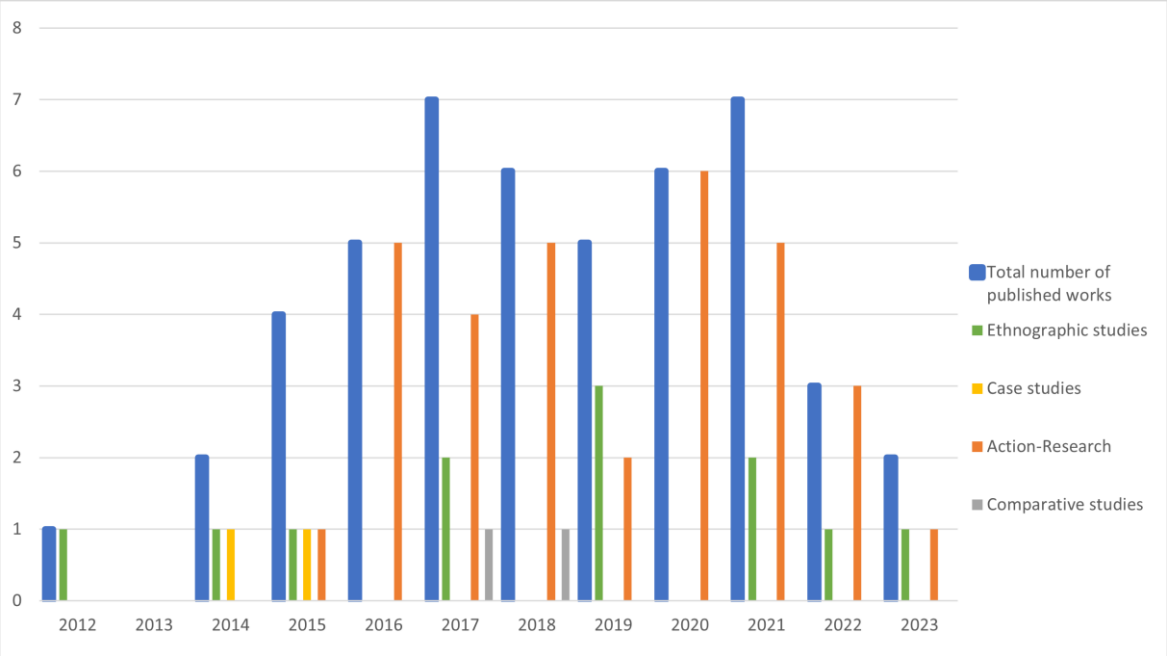

Figure 1. Number of articles per year of publication and research designs

Regarding the educational stage, we found that 14 of the studies were of secondary school students and 13 of primary school students. These were the two most numerous categories, followed by early years' education (n=6), higher education (n=6), baccalaureate (n=3) and research conducted beyond a formal educational context (n=3). One of the studies consisted of a training course for graduate education professionals, who were trained in multimodal creations using Scratch (Lemieux, & Manson, 2022). We also found work that involved students' families (Lozada, *et al*., 2021), work carried out outside the physical school context (n=3) and one study that brought together students from both primary and secondary education (Hess *et al.,* 2019). In terms of subjects, studies that develop complementary courses in coordination with teachers were the most frequent (n=15). However, the group of subjects was varied: Literature (n=7), English through the Arts (n=5), English as a Second Language (n=5), Music (n=4), and Natural Sciences (n=1). Some of the research occurred in school areas outside the classroom, such as at recess, the playground or on the school bus (n=8), while others occurred in the classroom, but no subject was specified (n=3). This diversity points to a heterogeneous concept of school and education, not always confined to the physical limits of a classroom or the school building. School experience travel to and from other spaces and contexts related to education, merging with the musical and sonic experience of the students. Finally, it is worth mentioning the differences that exist between the different roles adopted by pupils in the studies reviewed. The learner sometimes has the role of creator of the multimodal material, and they are the one who generates the product that usually represents the object of study. This occurs frequently (n=35), while at other times the learner is the receiver of the multimodal message (n=5), analyses a particular resource (n=5) or participates as both creator and analyst (n=3).

We found similarities and differences in the approaches to multimodal literacy (Leander, & Boldt, 2013). Common features included the combination of auditory and verbal modes (n=40). This means that, in these works, auditory material existed alongside elements of verbal language, either spoken or written. It was also common to find auditory material combined with images, logos, gestures, videos, and other visual media (n=35). Sound effects and music were frequently combined with performative or gestural (n=21), spatial and movement (n=10) and haptic elements (n=2). Multimodal proposals that include haptic elements involve students in decoding processes through touching (Dalton, & Musetti, 2018; Stufft, & Gillern, 2021). Furthermore, these modes were presented in up to 15 combinations as can be seen in Figure 2. Notably, we found remediation in 14 studies, although only two of them refer directly to this process, using the term "remediation" itself or some synonym such as "transmodal redesign" (Tomlinson, 2015; Alexander *et al.,* 2016). The auditory mode materialized in very different ways across the sample: sound effects, soundscape elements, narration, onomatopoeias, and rhymes and music, the latter being the most frequent (n=35). We also analyzed the use of metalanguage in the research, i.e., whether the communicative possibilities of the codes used were reflected upon or explored in greater depth. We found that 60.42% of the studies included metalanguage in their approach to the study. However, only 31.35% of the studies allowed access to the material being worked on, always through links or QR codes.

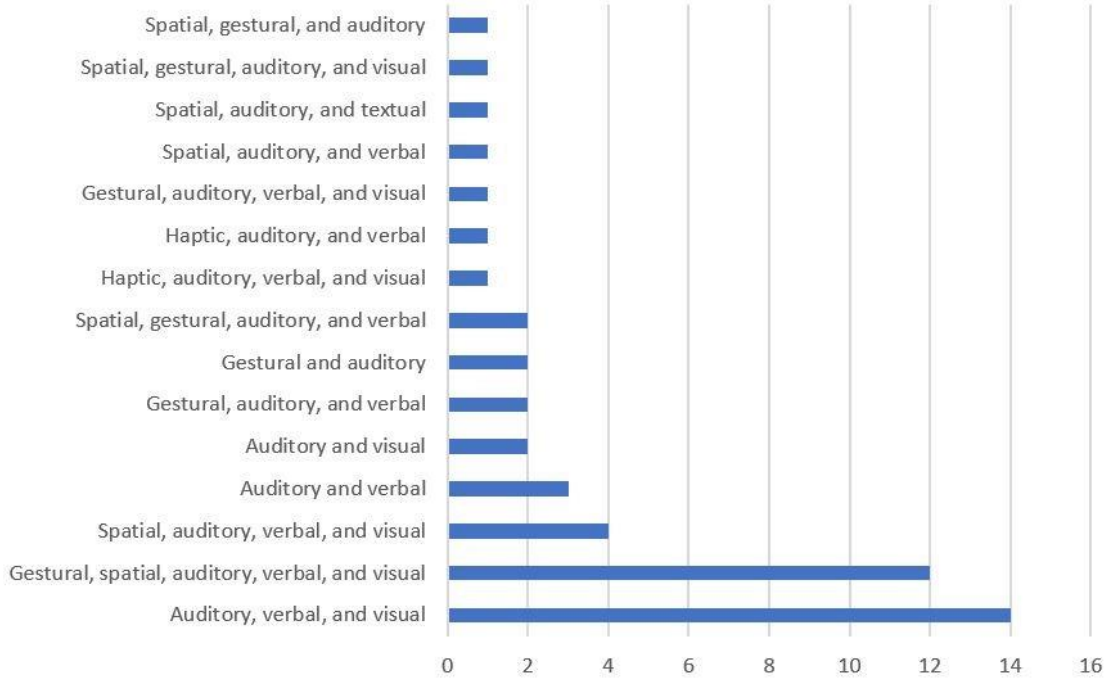

Figure 2. Frequency of occurrence of communicative modes

We also analyzed the kind of sound domains that appeared explicitly within researchers' analyses. This does not mean that a song, for example, had no melody, but rather the author has not attributed meaning to melody within the research. We found 10 articles that conveyed meaning by alluding to sonic issues of texture and the interaction of sounds and voices. One example is a study in which students created a podcast exploring the relationships that exist between the different sounds they found at school (Doerr-Stevens, & Buckley-Marudas, 2019) or a study that analyzed the sounds in the playground and in some primary school children's games (Countryman, & Gabriel, 2014). We identified 13 studies in which reference was made to melodic

or pitch elements. Burn (2016), for example, analyzed the impact of descending scales or an ostinato in the production of animation movies by his students. In terms of sound, 25 of the works included elements related to directionality or intensity in some way. Some researchers used virtual reality (Hutchison, 2018; Yeh, & Tseng, 2020), digital sound effects (Stufft, & Gillern, 2021), and sound walks (Wargo, 2018b). The research that investigated temporal or rhythmic sound elements (n=24) were often related to the prosody or rhythm of the text (Höglund, 2022), while in other cases they were used in musical productions such as rap (Morgade, *et al.,* 2016). The timbre domain, on the other hand, was found in works that assessed the sound of different voices or instruments, which appeared in a total of 21 research items. It is interesting to note the relationships established between the different domains: frequency of groupings, possible incompatibilities, hierarchies, etc. Table 1 shows the frequency of appearance of the sound domains in each of the articles.

Table 1. Sound Domain Frequency and Correlation

	Sound Domains (van Leeuwen, 1999)					
	Voices interaction	**Melody**	**Modality**	**Perspective**	**Time**	**Timbre**
Alexander, *et al.,* 2016		x	x	x		
Baize, 2019		x				
Barton, et al., 2022			x		x	
Blom, 2017			x		x	x
Burn, 2016		x	x	x	x	x
Butler, *et al*., 2021		x			x	
Chen, 2021			x			
Countryman, & Gabriel, 2014	x	x	x	x	x	x
Dallacqua, *et al.,* 2015			x	x		x
Dalton, & Musetti, 2018			x	x		x
Dalton, & Smith, 2015					x	x
Doerr-Stevens, & Buckley-Marudas, 2019	x		x	x		x
Domingo, 2012	x		x		x	
Flint, *et al.,* 2021			x		x	x
García, *et al.,* 2021	x			x	x	
Hackett, *et al*., 2017	x			x	x	x
Harrop-Allin, 2017	x				x	x
Hess, *et al*., 2019			x		x	
Höglund, 2022		x	x	x	x	
Huang, 2017		x	x			x
Hutchison, 2018				x		x
Kim, & Li, 2021			x	x		
Lemieux, & Mason, 2022			x		x	
Lewis, 2020			x			
Lim, & Tan, 2018			x	x		
Lozada, *et al.,* 2021			x		x	

McIntire, 2020		x	x				
Mills, & Stone, 2023	x	x	x			x	
Morgade, *et al*., 2016	x				x	x	x
Narey, 2019		x				x	
Nash, 2023			x				
Olaussen, 2019	x		x		x	x	
Park, 2021			x				x
Pytash, *et al*., 2017			x		x		
Smith, & Dalton, 2016			x				
Smith, *et al.,* 2017			x		x	x	
Stufft, & Gillern, 2021					x		x
Tomlinson, 2015		x			x	x	
Tomlinson, 2014	x	x			x	x	
Wallner, 2020			x				x
Wargo, 2017			x		x		
Wargo, 2018a			x		x	x	x
Wargo, 2018b					x		x
Wessel-Powell, *et al.,* 2018			x		x		
Wessel-Powell, *et al.,* 2016		x	x				x
Williams, 2020			x			x	x
Wohlwend, 2015							
Yeh, & Tseng, 2020							

Finally, the modality domain refers to the figurative capacity of sound. To define this category, we evaluated whether the "iconicity" of the sound event was analyzed in the study, which might make it possible to make a classification between a greater or lesser modality, that is, a greater level of closeness between the sound and its real manifestation, between signifier and signified. Modality is a quality that encompasses, in a way, all the other domains. All elements such as time, perspective, pitch, etc. influence the ideas we construct about sound (van Leeuwen, 1999). In the work of Alexander *et al.* (2016), for example, a student plays with this modality intention, modifying sound effect recordings that a priori seem unconnected to the visual material these sounds are presented with. It should be noted that those articles that incorporated musical elements specifically addressed melodic, rhythmic, or texture-related issues (Tomlinson, 2015; Williams, 2020). However, in other cases (Dalton, & Musetti, 2018), the song is understood as a whole and the impact of music as a compendium of elements is reflected upon. On other occasions, the articles focused on the auditory analysis of the lyrics of a song, an element that would not fit within the domains proposed by van Leeuwen (Baize, 2019). We found research where, albeit considering sound and music as modes, were primarily focused on more traditional understandings of multimodality. For instance, Kim and Li (2021) mentioned music as one of the multiple resources that students effectively utilized in their compositions. However, no sound domain or music trait were mentioned in the analysis of these products, and their analysis dwells mostly on the visual or writing modes.

5. Conclusions

Music (and sound) is an abstract language with a great capacity to communicate, transmit and represent (DeNora, 2009). The digital transformation of society has allowed new ways in which this language interacts with other disciplines, and the multimodal conception of literacy opens up a multitude of possibilities for its application in education (Salmon, 2010). However, relatively few researchers choose to focus on acoustic issues when developing multimodal literacy research designs. Going back to the results obtained in the identification phase of the review in this paper (110 in WOS and 143 in Scopus) and comparing them with the results obtained with the descriptors multimodal* AND literac* (1911 in WOS and 1858 in Scopus), we can conclude that there is a very high percentage of studies that exclude or do not consider sound or music within their multimodal literacy approach. These findings align with the need identified by Elwick *et al.* (2020, p. 179) to "design and advocate for research that meaningfully engages music and sound practice and discourse and, in doing so, contributes to a new understanding of children's experiences of music and sound practices".

According to our first objective, this review has allowed us to consider the trends in studies that deal with sound within multimodal literacy, and also to highlight the gaps that still exist in this line of research. We have detected a tendency to carry out ethnographic studies at early educational stages (early childhood and primary education) and to develop action research in which students create or analyze multimodal elements at secondary or higher education level. It would be interesting to study in greater depth the way in which the role of creator is developed in early years' education and, in turn, to use ethnographic tools to analyze adolescent literacy practices. The need for research in this respect makes particular sense if we take into account the number of multimodal resources that can be found in social networks, video games and other platforms used regularly by young people. On the other hand, the lack of quantitative studies in the corpus emphasizes a typical trend in music education research in which the sample is usually small-scale. The use of qualitative methodologies also shows the multiplicity of multimodal practice, hard to be depicted in academic research through quantitative methods. Artistic experience is considered relational and experiential, and research should attend to all agents that may influence how children create their aural worlds (Rowsell, 2013; Wargo, 2018b).

Secondly, regarding the semiotic implications of the auditory mode in multimodal research, we can say that sound has a high versatility, as a multitude of sound elements are identified in the different studies; these include sound effects, vocalizations, chants, narrations, musical elements, songs and so on. In line with Nash (2020), we conclude that sound can have a high level of narrative impact. However, we have found several studies that limit the auditory mode to the use of "background music", without making explicit the relationship between the music used and the communicative intent of the message or meaning (Baize, 2019; Blom, 2017; Dalton, & Musetti, 2018). When limiting the use of music and sound to the background, as a mere accompaniment, their capacity of communicating and thrilling is neglected, sometimes motivating the receiver to "ignore" the aural inputs (DeNora, 2009). On the other hand, articles such as Burn's (2017) make a complex and complete use of the auditory mode, giving weight within the message to different sound elements. We have also seen that most studies have a representational approach, based on fixed relationships between signifier and signified (MacLure, 2016). We advocate broadening the field of study around the sensory by focusing on the listening or creating experience itself, and on the relationships established between sound and participants

(Powell, & Somerville, 2020). Recent interpretations of sound as a holistic experience shows a much deeper multisensorial complexity, but sound has not explored yet its semiotic potential beyond van Leeuwen's work in 1999. The moment we move away from the linguistic to focus on embodiment, the possibility opens up to understand the experience of sound in a more integrated and complex way.

Analysis of the data allows us to venture that new technologies will encourage the emergence of new sound elements, as has been happening in recent years with, for example, virtual reality (Hutchison, 2018; Yeh, & Tseng, 2020). This may provide an opportunity for researchers and educators to design innovative multimodal approaches that explore acoustic possibilities to their fullest. Our review aims to serve as a guide for teachers interested in multimodal literacy to develop innovative educational practices in this field. It has been found that multimodality often leads to a lexical and visual approach, while some authors defend the possibilities of sound in multimodality (Wargo, 2018a). This review challenges the limitations to which the concept of multimodality can lead to, as it was conceived in a sort of "aural marginalisation". In addition, it is intended to lay the foundations for a solid line of research that will facilitate a further exploration of multimodal literacy from the perspective of sound studies, with the intention of recognising and expanding the communicative and educational possibilities of sound. Despite results show a hopeful future for sound in multimodality, much work should be done to equate sound and music with visual and verbal in multimodality.

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Those titles preceded by an asterisk (*) are part of the review corpus:

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Editorial: Innovation in music education

Editorial: Innovación en educación musical

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The recommendations of the European Council of 22 May 2018 warned of the need to achieve quality education that has as its driving force the acquisition, by citizens, of key competences for the development of lifelong learning or learning for life. These competences, together with the specific competences in the field of music education in the 21st century, require the necessary adaptability of pedagogical models that include, at a curricular level, educational innovation methodologies adapted to music education from a critical and contextualised (re)approach in the educational environments in which teaching is carried out, and all that this entails within the challenge facing us as specialist music teachers.

This monograph "Innovation in Music Education" aims to offer readers a range of research studies which, from different approaches, bring us closer to music education from an innovative 21st century perspective. We will approach studies linked to avant-garde musical innovation and critical pedagogy through the development of reflective processes on the musical experience as a technique of educational mediation. It shows part of the most elaborated scientific result of some of the contributions of national researchers to the I International Congress: Intersection of Art, Society and Technology in Musical Innovation, held from 3 to 5 September 2021 and organised by the University of Valladolid and the Katarina Gurska Institute for Artistic Research (IKG), the latter being a body dependent on the Katarina Gurska Foundation for Education and Culture.

From the University of Aveiro (Portugal), Maria J. Vasconcelos, Helena Caspurro and Nilza Costa delve into educational innovation in their article: “Problem-based learning. Composition in the classroom as a challenge for learning music".

The article carries out a literature review to determine what data can be found on the implementation and study of music through composition using the educational innovation method of problem-based learning as a methodological underpinning. The scientific studies collected in the review bring us closer to understanding the diverse and holistic ways of understanding intrinsic musical learning processes using musical composition as a resource within the PBL methodology. How PBL enables critical thinking, the basis of learning, entrepreneurial and citizenship competences, among others, achieving situations of autonomous and shared learning.

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In short, it provides us with data on scientific research in which they develop innovative strategies for musical learning through overcoming challenges within compositional processes.

The second article, entitled "Creativity in music education today: a review from school levels and teacher training" by Yolanda Trujillo and Verónica Juárez, focuses on creativity in music education in the 21st century as an object of study on which the systematic review of specific literature (RSL) is carried out using the PRISMA protocol. The study analyses 57 articles and determines the lack of promotion, in general terms, of working on creative processes in music education. Following this systematic review, it is evident that, in certain research, the focus is on the musical phenomenon that accompanies the creative process and not on the process itself, alerting us to the lack of stimuli within teachers when it comes to carrying out creative practices in the music classroom.

The third article entitled "Analysis of an intergenerational music education project in initial teacher training: a case study" and signed by José Luis Parejo and María de la O Cortón is an exploratory, descriptive and interpretative study in which the design and implementation of an intergenerational music education project was analysed in a group of elderly dependent people with the participation of primary school pupils, and directed by a group of university students, future music teachers. The results derived from the analysis of qualitative data show that the project, through music, has favoured the (re)knowledge of the elderly, the improvement of their well-being and their social inclusion as a group. Not only has the project been beneficial for the elderly, but also for the children and teachers in training, where civic values have been reinforced and the project has made it possible to create a space for dialogue, meeting and community participation.

The monograph closes with the article by Javier Olvera, Almudena Ocaña and Ramón Montes, entitled "Listening to students through their musical preferences: dialogic gatherings, an opportunity for critical music education". This is a qualitative study which, through various techniques and instruments, obtains interesting data derived from the importance of addressing musical repertoire linked to the musical concerns of students in order to achieve, through educational innovation techniques adapted to music teaching environments, the opening up of more democratic, open, committed, reflective and critical educational-musical scenarios.

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MONOGRAPH

Problem-based Learning: Composing in the classroom as a music learning challenge

Aprendizaje basado en problemas: la composición en el aula como desafío para aprender música

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Abstract

Problem-based Learning (PBL), one of the most widespread student-centered teaching models, prioritizes cooperative and challenge-based learning, with teachers acting as "facilitators", and formative assessment processes. In music, the search for ways to enhance the (co)construction of learning and complementary responses to expository methods resonates with composition centered proposals, with some incorporated into Music Education curricula as in the Portuguese case. What characterizes PBL, what data exists on its application and what links can we establish with musical learning to systematize its implementation and study through composition reflect the questions motivating this literature review. *Thinking in sound, thinking in music, holistic learning, creative thinking,* provide the constructs and references through which we discuss the foundations of this model. The summaries, in turn, produce the following conclusions: the study of PBL generates both benefits and constraints, and research on its theoretical principles continues to be far more abundant; composition in itself represents a problem-solving process, and musical learning through composition, when viewed according to the aforementioned constructs, can take shape in a way that aligns with PBL; it works as a guiding model for musical and educational planning, action and research, particularly through composition.
Key words: Problem-based Learning; Cooperative Learning; Music Education; Musical Composition.

Resumen

El Aprendizaje Basado en Problemas (ABP), uno de los modelos centrados en el estudiante, prioriza el aprendizaje cooperativo/basado en desafíos, los docentes como “facilitadores” y procesos de evaluación formativa. En música, la búsqueda de formas para mejorar la (co)construcción del aprendizaje y respuestas complementarias a los métodos expositivos resuena con propuestas de composición, algunas de las cuales se han incorporado en los planes de estudios de Educación Musical en Portugal. Lo que caracteriza el ABP, qué datos existen sobre su aplicación y qué vínculos podemos establecer con el aprendizaje musical para sistematizar su implementación y estudio a través de la composición reflejan las preguntas de esta revisión bibliográfica. *Pensar en el sonido/música, aprendizaje holístico, pensamiento creativo,* proporcionan los conceptos a través de los cuales discutimos los fundamentos del modelo. Los resúmenes generan las siguientes conclusiones: el estudio del ABP arroja tanto beneficios como limitaciones, y la investigación sobre sus principios teóricos es más abundante; la composición representa un proceso de resolución de problemas, y el aprendizaje musical a través de la composición puede tomar forma que se alinee con el ABP; el ABP funciona como un modelo orientador para la planificación, acción e investigación musical/educativa, particularmente a través de la composición.
Palabras claves: Aprendizaje Basado en Problemas; aprendizaje cooperativo; educación musical; composición musical.

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1. Introduction

The challenges posed by contemporary society have broadened the issue of learning, placing it at the center of political and educational discourse. The development of autonomy, critical and creative thinking, research and cooperation competencies, curiosity, and learning to learn, not only configure guiding principles of curricular and ministerial discourses, but also demand alternative and complementary models to expository, imitative, and direct instruction. Problem-based Learning (PBL) represents one such path and provide a source of inspiration for developing other approaches, such as Challenge-based Learning, Project-based Learning, Inquiry-based Learning, or Team-based Learning, which, although differentiated, share the same philosophy. Even though its study aggregates scientific literature, its application to music education requires continuous consolidation, particularly regarding the reflection, conception, and empirical treatment of appropriate action plans, not only for curricular purposes, but also for those ideals.

Consisting of a literature review, this paper sketches the scope for learning music through creation and composition, a path that, in line with the thinking of various authors, brings together ingredients that seem to meet the principles of that model. The article represents one output of a broader research project, conducted in the Portuguese educational system, hence the references to this topic made in the text.

2. Defining PBL

2.1. Exploring theoretical foundations and problems as levers of knowledge

PBL, as a widely disseminated teaching and learning model or process, originated at the Faculty of Health Sciences of McMaster University, in Canada, in the 1950s and 1960s, in response to dissatisfaction with common practices in medical education (Barrows, 1996). From a philosophical point of view, it is based on the principles of constructivism, rooted in the Socratic *maieutic* of classical Greece, particularly in the privilege given to dialogue and the pursuit of knowledge through inquiry, as well as in the ideals of the *active school*, that emphasizes the value placed on the student as an agent in their own learning. This additionally draws on the pragmatic view of education promoted by Dewey, emphasizing the social, interactive, and experimental nature of the phenomenon of learning (Arends, 1995; Yew, & Schmidt, 2012). Thus, this configures the image of subjects who, in their process of development and learning, also construct knowledge, motivation, beliefs and interests, rooted in the cognitive movement emerging out of the works produced by Piaget, Vygotsky, and, later, Bruner (Abeles, & Custodero, 2010; Gigbels, *et al.*, 2005; Schunk, 2012), theories that inherently reflect concepts and perspectives on literacy – and their consequential impact, as we all know, on the widespread development of curricula and educational practices (what is important to learn and know, how it is promoted and translated into meaningful and useful experiences for students, including in the socio-emotional realm, etcetera). In this unfolding of ideas, *learning by discovery* (Bruner, 1961) also gains particular relevance, including its characteristic aspects such as student set problems that require solving through discussion with peers, and the intrinsic motivation to learn– which, encountering especially favorable conditions for its maximization in environments closest to non-formal learning,

contributes as mobilizers or facilitators for the assimilation and retention of information that acquires personal meaning for students (Torp, & Sage, 2002).

"Problems are the heart of PBL" (Hung, 2006, p.56). In the field of medicine, they often take the form of a patient's description involving a series of signs or symptoms (Schmidt, 1994). However, their formulation in education may have more complex contours as this focuses on competencies and/or content and often requires interdisciplinary, or even multidisciplinary, solutions (Hmelo-Silver, 2004). Most research on problems approaches issues related to design and substance, aspects that arise from considering the self-regulated learning paths associated with perspectives on the scope for mobilizing prior knowledge, intrinsic motivation, and the relationship of challenges with reality (Blumenfeld, *et al.*, 1991; Mauffette, *et al.*, 2004; Rotgans, & Schmidt, 2012; Schmidt, *et al.*, 2011). Authenticity establishes the basis for problem selection as the underlying curricular approach aims to stimulate and prepare students for the challenging and demanding environments of the real world, hence, to become practical problem solvers (Savin-Baden, & Major, 2004; Stepien, & Gallagher, 1993; Strobel, & Barneveld, 2009).

The role of prior knowledge or experiences takes on relevance as both the desirable articulation between their level and range, and the degree and type of challenges posed, depend on, and determine the scope for achievement: inquiry, questioning, formulation of multiple hypotheses and/or results (Jonassen, 2011; Schmidt, *et al.*, 2011). Nevertheless, the phenomenon of self-regulation underlies the entire process and experience of problem-solving, and, perceived as one of the guiding principles of this model, it simultaneously emerges as an end and a learning competence. Examples of problems arising in the music curriculum context would be, among many others and focusing here on composing: researching sound solutions for graphic or pictorial representations or images, unveiling, classifying and interpreting them through musical instruments, including the ear, body and/or voice, allegorically, associations or dichotomies (timbres, textures, combinations of durations, rhythms and pitches, forms, temporal structures); classifying and sonorizing stories or characters through metaphorical imagination –achievements also capable of integrating specific artistic, interdisciplinary and cultural projects (performances, theater, movies, etcetera).

2.2. Cooperation, sharing and teacher as “facilitator”

While Hung (2006) maintains problems are at the heart of PBL, according to Mennin (2007), the same can be said about small-group learning. Drawing on Delisle's (1997) narrative, when someone unfamiliar with PBL observes a class in this context, they may consider it different to what they usually think of as education: they do not see students sitting in rows but rather working together in small groups; they may expect absolute silence while students listen to the teacher but eventually encounter background noise from ongoing group activities. This references cooperative learning, a current topic incorporated into the OECD's universal programs for education and the 21st century educational policy agenda (OECD, 2023; Silva, & Fernandes, 2019). Emotional and social development, which are associated with highly valued soft skills, account for one of the main reasons for advocating cooperative learning, with its philosophical roots in socio-constructivist theories. This particularly shapes perceptions of the actions and the nature of the learning subject: respectively, inter-agent and social (Schunk, 2012; Schunk, & Zimmerman, 2013); in fact, constant features of non-formal learning, a process also receiving attention from leading figures in psychology and education, and now established on curricular

agendas and reflections, including for music (Green, 2012; Mans, 2009; Smart, & Green, 2017). The reference to the school's cultural role and, therefore, to its positioning in the social construction of knowledge, contributes to supporting such concerns and, correspondingly, to teaching visions driven by the co-construction of learning in the classroom, in accordance with the respective social reality of scientific and empirical thinking and acting (Dewey, 2002; Verenikina, 2010; Vygotsky, & Cole, 1978). This outlines the context that renders theoretical support to cooperative learning, often portrayed in the literature and empirical research alongside the potential for ensuring the mobilization of aspects such as communication, sharing, and creativity; the same ingredients highlighted for managing and constructing motivational and self-regulatory processes (Brandt, 1991; Culclasure, *et al.*, 2019; Gillies, 2014; Johnson, *et al.*, 2000; Johnson, & Johnson, 2009; Luy-Montejo, 2019; Savin-Baden, & Major, 2004; Slavin, 1980).

Returning to the idea described above, someone unfamiliar with the topic being discussed here may not have encountered the teacher lecturing at the board or reading to students from the front of the classroom. Instead, they may see the teacher sitting at a group's desk, commenting on what they have accomplished or, alternatively, over in a corner of the room writing notes about class activities, or carrying out research outside or during recess. There may even be a false sense that teachers do not have to expend much effort, simply observing groups learning on their own. However, this is not the case considering the time required to construct problems, monitor students throughout projects, encourage their autonomy, and evaluate their performances and success in dealing with challenges. Clearly, the teacher's role is vital for the effectiveness of this experience (Delisle, 1997). Thus, we are not talking here about the teacher as the source of knowledge (Prodan, 2016) but rather as a guide for learning or as the "facilitator" (Charlin, *et al.*, 1998; Hmelo-Silver, 2006; Williams, 2012). The promotion of environments favorable to community spirit, cooperation, and dialogue is therefore a crucial teacher competency (Johnson, & Johnson, 2008; Weeb, 2009).

2.3. Assessment as construction and learning

Assessment continues to pose a challenge in the PBL implementation context (Moust, *et al.*, 2005; Savin-Baden, & Major, 2004), especially as this approach deals with learning reaching beyond factual and declarative knowledge about a specific subject and results mainly from self-directed student-centered trajectories (Waters, & McCracken, 1997). Understanding and the processes involved in this, broader in nature (Torp, & Sage, 2002), including interpersonal competencies, bring complexity to a subject that seems to be the face and challenge of the model itself. Issues such as the validity and reliability of assessment instruments arise as recurrent problems within this dimension although possibilities that have been experienced emerge out of the literature analyzed (Hargreaves, 2007; Wiggins, 1993). Thus, there is a diversity of approaches (Vleuten, & Schuwirth, 2019) to assessing PBL, ranging from traditional exams to other techniques, such as case-based assessment, performance-based assessment, portfolio assessment, as well as self- and peer-assessment (Gigbels, 2005). Other aspects highlighted include the monitoring functions (teacher) and self-monitoring (students), and their respective strategic implications, such as initial and regular dialogues (teacher-student) about the goals to be achieved, frequent feedback, group presentations, as well as the complementary instruments or mechanisms to stimulate critical thinking (Savery, 2006). The essentially formative nature of assessment, and thus its assumption as the learning, and the process of social construction of the subject, finally raises reflection on the topic within the context of the broader problem this involves. In particular,

the debate between models focused more on product and performance, and on teacher authority, or on processes, and what students significantly construct, mobilize, and recognize as learning. Given not only the interest this raises but also in keeping with the complexity of these processes, this topic deserves further analysis that shall be published in a specific article.

3. Understanding music learning through composition

3.1. Exploring definitions, meanings, and curricular pathways

It is unquestionable that the approach to composition in educational contexts is determined by the respectively prevailing aesthetic, historical, social, cultural, and curricular contexts, including the corresponding perceptions in terms of its substance, meaning, and place in the learning process. From a psychological and educational point of view, the notion of composition as a domain of knowledge and know-how, which establishes the basis for the reflections in studies carried out by various authors whether approaching through the lens of fields such as philosophy, aesthetics, and sociology, seems to have contributed to the development of its definition, function, and place in curricula; as well as educational conceptions about music and musical literacy in almost every part of the world (Bamberger, 1977; Barrett, 1990; Burnard, 1995/1999; Burnard, & Younker, 2004; Elliot, 2005; Hickey, 2003; Hickey, & Webster, 2001; Kratus, 1989/1991; Malotti, 2023; McPherson, & Gabrielsson, 2002; Mills, & McPherson, 2006; Mills, & Paynter, 2008; Wiggins, 1992/1994/2003; Odena, 2018), which includes the Portuguese educational system (ME, 2001/2021; Silva, 2008; Vasconcelos, *et al.*, 2016/2022; Veloso, & Mota, 2021). Specifically, the study that encompasses psychological and cognitive processes, allows us to position composition not only in terms of what it constitutes as a process, nature, or quality of musical knowledge, but also in terms of what it demands for its realization, even on the emotional and social level. That is, individually or collectively, what it represents and signifies as a mode or methodology of inquiry, research, and interpretation of musical knowledge and learning, including social skills and (self)assessment.

The ideas of Schafer (1965) in Canada, and Paynter and Aston (1970) in the United Kingdom, were instrumental in fostering the development of composition within music education, particularly as a holistic and curricular pathway of learning (Paynter, 2000; Paynter, & Aston, 1970; Rusinek, 2012). These and other authors, including those contributing to the well-known *Comprehensive Musicianship* movement, driven by various initiatives developed in Canada and the USA throughout the 1960s, such as the *Young Composers Project*, the *Canadian Music Centre*, and the *John Adaskin Project*, and later in the USA, the *Contemporary Music Project*, with replications in several countries –such as in the UK, led by Self, Denis, and Foster; in Germany, by Agosti-Gherban and Rapp-Hess; and in France, by Delalande, Jarrié, Reibel, and Renaud (Comeau, 1995)– have played decisive roles in developing experiences and ideas in formal and non-formal contexts, especially around contemporary and avant-garde music, whose impact on pedagogy and curricula still resonates today. One example would be the *Manhattanville Music Curriculum Program* (Thomas, 1970), which was, in 1991, ascertained as having influenced the conception and assumptions of the Portuguese Music Education curriculum for the general education (ages 10-12), particularly in the emphasis placed on the action of creating and composing, in close articulation with expressive and instrumental performance, listening and analysis, including in the context of a cultural and social repertoire that extends outwards to the

world, ultimately transforming the very concepts of musical literacy. That is, what is understood as musical literacy and learning music.

In the Portuguese context of general education, curricula have been reflecting concerns over highlighting paths of musical learning that involve, in addition to other types of experiences (of a technical, performative, and imitative nature), the active engagement of students in seeking and discovering questions and solutions for challenges. Swanwick's CLASP (*Composition*, *Literature studies*, *Audience listening*, *Skill acquisition*, *Performance)*, which is configured as an organizer of diversified music learning processes, recommended by the Portuguese Music Education program since 1991, reflects the theoretical and concrete result of this same curricular concern (Swanwick, 1979/1988); and which suggests obvious implications for the way in which musical literacy is perceived and defined –what and how it is planned, emphasized, valued and mobilized to promote it. The trend of prioritizing the process of thinking, making mistakes, and constructing meaning through the challenge posed by inquiry and discussion (rather than the knowledge and subject matter for their intrinsic and epistemological value), aligning with the principles of constructivism and social constructivism, has continued to advance, as witnessed by the most recent normative documents. Especially due to the relevance they emphasize giving to experimentation/creation, considered "basic to the development of meaningful learning" (ME, 2021, p.3). Additionally, because the processes of experimenting, creating, and imagining constitute a privileged domain for the experience of holistic musical experiences; namely, through the integrated and cross-exploration of aspects such as timbre, rhythm, pitch, expressive elements, form, genres, and world cultures –perceived and presented as "clarifiers, facilitators, and systematizers of students' listening, practice, and creation" (ME, 2021, p. 4). Therefore, there is a sufficiently rich history and theoretical framework to assist in understanding how composing, individually or in small groups, "solo" or cooperatively, has become an established activity, also within the educational frameworks of many countries (Barnes, 2001; Barrett: 2003; Fautley, 2010; ME, 2021; Odena, 2018; Philpott, & Evans, 2016; Rusinek, 2012; Vasconcelos, *et al.*, 2022).

In recent years, approaches concerning the composition and exploration of expressive skills focused on sound have been advocated and proposed through constructs such as *sound education*, as an alternative to *music education*, especially with the aim of critically emphasize the inclusive and universal nature of education and music within the context of the different formal education systems and teaching practices (Recharte, 2019; Veloso, *et al.*, 2023). The belief that "music" and "musical", associated to curriculum processes and guidelines, are concepts that convey intentions or possibilities of musical learning that are not always truly participatory and democratic in nature, shapes the ongoing debate. Among the arguments invoked, stands out, besides others –such as the need to align classroom learning processes with those developed in non-formal contexts– the associations to which these constructs have been confined: either to specific idiomatic conventions, particularly of the western culture (repertoire, instruments, practices, etcetera), or to beliefs, especially regarding "talent", generally rooted in concepts of performance and technical skills validated by the previous ones.

3.2. *Thinking in sound*, creating meaning: an active and holistic approach

The association of composing with formulations such as *thinking in sound* and *thinking in music* appears recurrently in the educational literature, stemming from the somewhat longstanding debate around the definition of musical literacy (McPherson, & Gabrielsson, 2002;

Mills, & McPherson, 2006), which links closely to issues bound up with comprehension and the construction of meaning. The emphasis placed on ways of *thinking*, and not just on ways of *knowing*, as well as *in* sound and *in* music rather than *about* music, produced debates led by philosophers such as Elliot (2005), and Reimer (2022), and expanded upon by numerous other educators (McPherson, & Gabrielsson, 2002; Mills, & McPherson, 2006; Swanwick, 1979/1988), as well as Gordon (2000), through the construct of *audiation,* among others (Azzara, 1991; Caspurro, 2006/2007), epistemologically reflecting on what constitutes the issues under debate. Above all, underlying the choice and focus on experiences of sound and the inquiring nature (*thinking in* sound and *in* music, *audiate*), a deeper discussion emerges that encompasses, in the field of music, views and approaches to the nature and quality of learning processes, contents, and meanings; particularly the role of the subject, subjects, modes, and contexts of learning and assessment as well as introducing more complex psychological and cultural processes (motivation, social interaction, cultural engagement, etcetera) into the construction of meanings around what is deemed most relevant to achievement within the scope of that defined as learning.

Here, we critically refer, especially in music conservatory practices, among others, to the preponderance weighting attributed to: musical performance as a competency that most closely resembles forms of performative and virtuosic realization and knowledge (in which creative processes are to a greater or lesser extent conditioned by the emphasis placed on memorization and music reproduction); to notational reading and writing (regardless of the processes of sound signification expressed through the concept); to theoretical contents (not necessarily representing formulated and induced interpretations of experiences and relationships constructed from sound phenomena or problems); to the prioritization of logical and theoretical inferences over fundamental sensory and perceptual learning for the construction of meanings connected with concrete reality (*sound before symbol* in keeping with the recognized theories of Piaget and Ausubel); to the attention paid to isolated concepts and phenomena (scales, intervals, chords, figures, notes, measures) and regardless of the holistic nature that is otherwise recognized as crucial for their assimilation and understanding (*Gestalt* theory); to the development of skills centered around the concept of the solo musician and within the scope of the so-called "classical" or "erudite" repertoire (despite the cultural diversity and complexity prevailing in contemporary society); to the primacy awarded to individual teaching and to learning methods that, even when in group contexts, rely either on experiences guided by the exposition given by the teacher or on the reproduction and memorization of knowledge (singing, playing, memorizing repertoire and representative composers, writing scales, identifying figures, intervals), particularly emphasized in test and exam evaluation procedures (dictations, readings) –examples of which, in the abundant literature, provide the core of the discussions ongoing in the music education field, which, as previously pointed out, intersects various scientific domains, such as psychology, philosophy, aesthetics, and sociology (Ausubel, 1963; Cobussen, *et al.*, 2020; Elliot, 2005; Gordon, 2000; Hallam, 2006; Piaget, 1970; Reimer, 2022; Sloboda, & Juslin, 2001; Vasconcelos, 2023; Webster, 2011).

Representing that valued and distinguished by educational systems and their stakeholders as the goals of music and artistic education, the examples described reflect dialectically and within the context of various educational systems, cultures, and concepts of music, learning, education as well as teaching practices in which the values and ideals of the *active school* encounter little resonance. Indeed: composition practices as well as improvisation; the exploratory experiences associated with student-centered teaching, learning, and assessment pathways –attributing

priority to the challenge of imagining sounds and sound relationships as ways of solving musical problems; ways of interpreting, problematizing, relating and comparing, classifying and transferring constructed on sound and musical experiences and realities (*thinking in sound, thinking in music, sound before symbol, audiation*); the importance paid to motivation and its self-regulatory processes and, for this reason, also to the social, cognitive, psychological, and cultural contexts most favorable to the "natural" and authentic conditions in which it thrives (social interaction and co-operation, non-formal environments, group work, access to and contact with diversified instrumental experimentation and listening activities); connections between the musical reality of the world and culture (contact with different musical styles and languages with practices and cultures approximating their interests and reality)– account for some of the concepts, formulations, and proposals that, in what they reveal from an educational perspective and echoing different theories and authors, seem to more closely resemble the scope for the co-constructing of meaningful music learning (Webster, 2011; Wiggins, 2001/2003). Furthermore, through this approach, alternative models to teacher-centered methods may be considered, discussed, planned, and researched.

Regarding the works and research developed and reported in literature, which underpin the strengthening and deepening of these formulations, the relationship between composing process (also seen in analogy with improvisation) and forms of musical thought that demonstrate modes of understanding and creating meaning have been highlighted by Kratus (1991), Burnard (2000), Wiggins (2003), Barrett (2003), Burnard and Murphy (2017) in studies involving children from primary and lower secondary education, along with others covering different age groups (Burnard, & Younker, 2004; Caspurro, 2006; Swanwick, & Tillman, 1986). This encapsulates the importance attributed to what seems to characterize composing as a personal and social vehicle for expression and the construction of learning in different musical performance contexts (Barrett, 2003; Veloso, & Mota, 2021; Webster, 2011; Wiggins, 2003); furthermore, in addition to improvisation, constructs such as *audiation*, *thinking in sound* and *thinking in music*, as well as sequentially anchored learning proposals based on the principle of *sound before symbol*, critically absorb issues surrounding the scope for learning music through the creation of sound and musical meaning and, as previously mentioned, also interrelating with the aforementioned concepts and approaches (Azzara, 1991; Caspurro, 2006/2007; Gordon, 2000; McPherson, & Gabrielsson, 2002; Mills, & McPherson, 2006; Priest, 2002). This also highlights the holistic nature of the knowledge experiences managed by these approaches. In fact, the view that learning meanings are constructed out of phenomena perceived as totalities is advocated by several authors, with evidences regarding the development and construction of musical structures and passages as entireties reported within the empirical experiences of creation and composition produced by children and adolescents (Bamberger, 1977; Goméz, *et al.*, 2022; Hickey, 2003; Kratus, 2001; Odena, 2012; Reese, 2003; Stephens; 2003; Veloso; 2017; Veloso, & Carvalho, 2012; Wiggins, 2003).

3.3. Solving challenges and assessment: creative and critical thinking

Finally, another finding particularly worth highlighting arises from associating the composing process with problem-solving approaches that closely resemble that commonly described as means or routes of creative thinking (Berkley, 2004; Burnard, & Younker, 2004; Kuzmich, 1987). Thus, this correspondingly privileges forms of applying imagination, *divergent thinking* (the quest for more than one answer and solution to the same problem) coordinated with

convergent thinking (problems with a single solution), insight, authenticity and spontaneity, assessment and critical thinking; as well as contact and confrontation with the challenge itself, the risk of uncertainty in achieving results, errors, and overcoming them (Barrett, 2003; Burnard, & Younker, 2004; Gardner, 2008; Guilford, 1973; Odena, 2018; Sawyer, 2003; Swanwick, 1988; Torrance, 1995; Wiggins, 2003). Although somewhat underexplored from an empirical and educational perspective, particularly in music, the importance today attributed to creativity, especially since the works of Guilford (1973), in its relationship to cognition and intelligence, reflects a feature that simply cannot be overlooked within the configuration of issues shaping the broader educational, political, and curricular debate –including the question of just what it means to know music, how this translates in terms of attitudes, expectations, and cognitive, expressive, performative, personal, and social performance, as well as culturally– with its impact reflecting far beyond (or otherwise) the level of intentions prevailing in virtually every education system (Goleman, *et al.*, 1998; Lowe, 2002; Odena, 2018; Robinson, 2001; Robinson, & Lee, 2011; Sawyer, 2003; Vincent-Lancrin, *et al.*, 2019).

The phenomena underlying the actions of applying, relating, evoking, and synthesizing knowledge, thus, in our view, transferring knowledge, also position composing as a privileged resource and strategy for assessment. This applies not only to the processes and contents of musical thinking and learning, their different dimensions, and interrelationships (through listening, feeling, interpreting, imagining, seeing/reading, associating, designing, singing, and performing music), but especially to the peer and self-assessment processes that the literature relates to develop critical thinking and, therefore, to self-regulation phenomena. This may also derive from how composing music mobilizes and enhances *divergent thinking* –which, unlike that required in *convergent thinking*, requires discussion– and, for these same reasons, forms of cooperative work.

4. Studying PBL, music and learning through composition

4.1. Method

The methodology applied in this literature review stems from its goal of gathering theoretical and empirical data connecting the field of music and learning through composition with what characterizes and underpins PBL, and the benefits and limitations of its application.

Initially, we carried out a literature review through searching for different sources (books and articles) about PBL, especially in the field of education but also reaching out to other areas (such as medicine given the significant amount of literature found). We utilized the *Web of Science, Scopus, ERIC,* and *JSTOR* databases, primarily considering titles containing the terms 'Problem-based Learning', 'PBL' or 'Problem Solving' and prioritizing open-access publications. We also added references both to theoretically contextualize PBL (including authors such as Bruner, Dewey, Gardner and Vygotsky), and to develop specific issues (for example cooperative learning, creativity, and self-regulation). The complete selection made features in the article's references. Furthermore, we simultaneously analyzed the articles published in the open access international journals "The Interdisciplinary Journal of Problem-based Learning" and "Journal of Problem-based Learning", from, respectively, 2006 and 2014 (the dates of their first publication) until 2021 (when we carried out the review of these specific journals). As this collection of articles

is so extensive, and with the respective journals hereby identified, the decision was made not to list the texts analyzed in the final references.

Regarding PBL in music context, we made recourse to the same databases, also prioritizing open-access publications but now applying a combination of terms related to both fields of research: 'Problem-based Learning', 'PBL', 'Problem Solving', 'Music', 'Music Education', 'Musical Learning', 'Composition', and 'Composing'. In this case, we employed the criteria based on whether the terms 'Problem-based Learning', 'PBL' or 'Problem Solving' were present in the titles of the texts published prior to 2021 for inclusion or exclusion. In parallel with this selection, we felt the need to complement the present review with literature focused on the formulations and theoretical constructs frequently reported in the field of musical learning through composition –improvisation, *audiation, creative thinking, divergent thinking, holistic learning, sound before symbol, thinking in sound,* and *thinking in music*– developed throughout the 20th and 21st centuries, and featuring throughout this article; as well as normative documents reflecting on the impact of these formulations and constructs on the Portuguese Music Education curriculum. All of these article references are detailed in the final bibliography.

We present the results below organized into the distinct categories that emerged from the data analysis procedure. At the end, with the purpose of systematizing the literature in the field of music, we set out a table with the selection of the articles that include the terms 'Problem-based Learning', 'PBL', or 'Problem Solving' in their titles, combined with 'Music', 'Music Education', 'Musical Learning', 'Composition', or 'Composing'. This table is organized by study typology, domains, and subjects, with the identification of the year/author of the publications. All the studies identified with an asterisk (*) have been published within Sarrazin's book (2018), thus the decision was made to solely cite the book within the ultimate references.

4.2. Results

The literature analysis demonstrates that the most extensively explored field in the context of PBL is healthcare, particularly medicine and nursing. Furthermore, when examining the articles published in "The Interdisciplinary Journal of Problem-Based Learning" and the "Journal of Problem-Based Learning", approaches have also emerged in fields including engineering, technology/multimedia, mathematics, education, and professional teacher development. In the music context, the set of articles analyzed reflects experiences and studies carried out in diverse domains, such as, among others, composition, instrumental interpretation, music teaching, ethnomusicology, music history, theory, and appreciation.

After collecting all the texts in the related aim, we classified the synthesized formulations into five distinct categories: (i) PBL definition and problem design; (ii) learning process; (iii) effects on skills acquisition; (iv) assessment process; and (v) tensions and challenges.

(i) PBL definition and problem design. Concepts including self-directed and student-centered learning are reported by most studies, including those in the field of music. The '3C3R' problem design model, proposed by Hung (2006), stands out as one of the relevant approaches for the design of problems, considered one of the main challenges and constraints to implementing PBL. "Content, context, and connection" (3C) and "researching, reasoning, and reflecting" (3R) represent the variables of the model the author proposes as a methodology for designing and

planning the challenges to be undertaken in different domains. The first set of variables relate to the subject matter itself, which should consider the design of dimensions such as complexity, real-world relevance, and the utilization of prior knowledge; the second pertains to the skills of research, reasoning, and reflection required by learning through challenges. While this model has not been reported in PBL studies applied to music, the treatment of content clearly covers diverse domains and contexts, mostly related either to musical experiences (listening, performance, notation reading, composition, movement) or to music learning anchored in processes of formulating and responding to challenges aligning with the 3Rs proposed by Hung.

(ii) Learning process. Working in small groups and the teacher's role as a guide and "facilitator", defining and characterizing distinct learning approaches from traditional methods account for recurring themes in the literature on PBL across all domains. This produces significant impacts, particularly in studies focused on its theoretical and philosophical foundations (Brandt, 1991; Gillies, 2014; Delisle, 1997; Hmelo-Silver, 2006; Hmelo-Silver, & Barrows, 2008; Johnson, *et al.*, 2000; Johnson, & Johnson, 2009; Savin-Baden, & Major, 2004; Slavin, 1980). In the context of studies applied across different educational settings, including those related to music, from an empirical standpoint, the information available primarily pertains to the effects of this model on learning. It is worth mentioning the exploratory study by Vasconcelos *et al.* (2016) in which cooperative work and teacher feedback, one of the competencies within the "facilitator" role, were highlighted by students undertaking music learning activities, involving creation and composition, of general education (ages 13-14). The work of Berkley (2004) reports the understanding of composing as a problem-solving process (complex, knowledge-mobilizing, and demanding in terms of developing skills associated with hypothesis testing and verification), a relationship also explored by Burnard and Younker (2004), who identify levels of creative thinking (from simple to sophisticated) as well as the common characteristics and differences in how students compose – despite being studies in distinct contexts, such as preparation for General Certificate of Secondary Education (GCSE) composition exams by student composers, and the analysis of individual composition strategies by students aged 11 to 20 from various parts of the world, respectively. While the mobilization of creative thinking has not been empirically studied as an outcome, this nevertheless gets both advocated and applied in research on PBL, particularly associated with Creative Problem Solving (CPS) and, in the music context, by authors including Berkley (2004) and Kuzmich (1987). In his pedagogical study, Kuzmich (1987), drawing upon data derived from his teaching experience across various curriculum levels, incorporates dimensions of learning into this concept beyond composition, suggesting that CPS serves as a comprehensive methodology that transcends different teaching and music education designs and practices. Closer to a therapeutic study applied to group dynamics, although not specifically in areas related to music, is the work of Lindvang and Beck (2015) who propose a model of musical listening as an instrument to promote its achievement, associating problem solving in a social context with metaphorical images extracted from specific musical experiences, namely improvisation and composition, here identified with the concepts of "journey" and "musicality". Other studies focus on more individualized musical contexts centered around the

application of problem-solving principles and strategies to the composition of musical pieces, the preparation of works by performers, and decision-making by arrangers, conductors, or composers (Chaffin, *et al.*, 2003; Lisboa, *et al.*, 2011; McAdams, 2004; Whitaker, 1996).

(iii) Effects on skills acquisition. The highest long-term knowledge retention, from which extrapolates gains for lifelong learning acquisition (of a self-regulatory nature, such as flexibility in relating to, formulating, and dealing with concrete problems, associated with capacities for comprehension, interest, curiosity, and autonomy), constitutes the factor most reported in the empirical studies analyzed (Blackwell, & Roseth, 2018; Yew, & Schmidt, 2012; Ventura, 2014). The presentation of better performance concerning socio-emotional skills in children from pre-school to 12th grade, and the impact on the development of emotional intelligence in university students, derived from the use of the model in cooperative work, were also empirically investigated in studies such as, respectively, Culclasure *et al.* (2019) and Luy-Montejo (2019). On the field of music and interconnected with those ideas, Whitaker's study (1996) puts forward a model based on problem-solving and decision-making strategies not only as an alternative to learning of a merely reproductive and imitative nature, typical of music conservatory practices and traditions of music and instrumental education, but also sets out pathways for the development of processes such as *audiation, perception, aptitude,* and *attitude* – which, according to the author, characterize Dewey's concept of reflective thinking. Blackwell and Roseth (2018) interprets the high levels of student motivation and an appreciation of the opportunities to experience real teaching scenarios as reasons for applying PBL in a woodwind instrument method teaching course; Ventura (2014) highlights how the model enables students to become self-directed and develop problem-solving skills within music technology in the high school; and Yang (2014) notes benefits related to the more active and engaged form of learning by students in the teaching of Music History.

(iv) Assessment process. Authentic assessment is applied both explicitly and implicitly in the literature on PBL, in pedagogical and empirical studies, incorporating strategies such as the use of checklists and portfolios, as well as peer and self-assessment (Garrison, 2018; Lenhouse, 2018; Savin-Baden, 2003/2004; Savin-Baden, & Major, 2004; Tai, & Yuen, 2007; Waters, & McCracken, 1997), with these latter strategies also reported in theoretical-pedagogical articles on the music field (Garrison, 2018; Leenhouts, 2018; Sarrazin, 2018; Shaffer, 2014; Thomerson, 2018). The literature also extends to other evaluative procedures, such as the 'triple jump' (Painvin, *et al.*, apud Savin-Baden, 2003), designed for the context of PBL while not involving cooperative work as the problem assigned to students are solved individually, discussed with the teacher, and with the solutions subsequently presented. Another approach is the 'tripartite assessment', created and applied by Savin-Baden (2003), which includes three components, one provided by a group and two individually developed. From an empirical standpoint, an important output relates to the effectiveness of the peer assessment process in the two experiments made by Segers and Dochy (2010) with economics and educational sciences university students. The study by Machado *et al.* (2008), also relating to peer and self-assessment, but among medical students, emphasizes the reliability of these strategies while highlighting how they are not considered valid in cases of

summative assessment that result in final grades. Furthermore, in a study involving students from social science programs, Lenkauskaite *et al.* (2021) present results portraying how students feel empowered when faced with the scope for assessing the entire educational process, as well as self-assessing their own involvement in improving assessment strategies. The exploratory study by Vasconcelos *et al.* (2016), as previously mentioned, also reveals results indicating an appreciation for the regulatory role of the feedback provided by the teacher to the students.

(v) Tensions and challenges. Defining problems, the initial adaptation of teachers and students, individual and group learning/assessment processes, time management, the complexity of didactic design and planning, as well as the unpredictability of the process and increased workload, feature among the difficulties and constraints highlighted in various studies (Aparicio, *et al.*, 2020; Blackwell, & Roseth, 2018; Duker, 2014; Garmendia, *et al.*, 2021; Koç, 2018; Lindvang, & Beck, 2015; Stevens, 2014; Yang, 2014).

We present below the selection of the analyzed articles that include the terms 'Problem-based Learning', 'PBL', or 'Problem Solving' in their titles, combined with ‘Music’, ‘Music Education’, ‘Musical Learning’, ‘Composition’, or ‘Composing’.

Table 1. Articles in the field of music

Study typology	Domains	Subject	Year, Author
Empirical	Composition	Teaching and learning composition as a creative problem-solving approach in preparation for the GCSE exam	2004, Berkley
		Transcultural perspective on creative thinking, with a focus on problem-solving and composition	2004, Burnard, & Younker
		Problem-solving strategies in musical composition	2004, McAdams
		Ideas on musical composition based on PBL and possibilities for practical implementation	2016, Vasconcelos, *et al.*
	Instrumental interpretation	Application of problem-solving principles by concert pianists in preparation of musical pieces	2003, Chaffin, *et al.*
		Artistic strategies, thoughts, and behaviors involved in learning a musical piece	2011, Lisboa, *et al.*
	Interpretation, conduction, arrangement, composition	A problem-solving and decision-making model for interpreters, arrangers, conductors, and composers	1996, Whitaker
	Music Technology	Application of PBL and E-learning in Music Technology classes	2014, Ventura
	Instrumental teaching	Training for woodwind instrument teachers	2018, Blackell, & Roseth
	Music teaching	Creative problem-solving approaches to learning	1987, Kuzmich
		Components of PBL and examples of how they are used in music classes	2012, Goodin, & Goodin
		PBL principles in a musical context	2014, Stevens
		Assessment of problem-based learning	2014, Shaffer
		Training for music teaching using PBL and interdisciplinary strategies	2018, Sarrazin*

Theoretical Pedagogical	Ethnomusicology	Design and implementation of PBL in Ethnomusicology	2018, Hunter*
		Application of PBL in Ethnomusicology	2018, Nicely*
		Introduction of PBL in an Ethnomusicology curriculum	2018, Webb*
	Music History/ Music Theory	Application of PBL in Music History classes.	2014, Yang
		Application of PBL in Music Theory classes	2014, Duker
		Application of PBL in Music History/ Music Theory	2018, Thomerson*
	Music Appreciation	Heightening Music Appreciation via PBL	2018, Garrison*
		Application of PBL in a Music Appreciation course	2018, Leenhouts*
	Introduction to Music	Application of PBL through exploring musical kinetics	2018, Horsington*
	Therapy with music listening/improvisation	Relations between creative processes in PBL, communication, and group dynamics	2015, Lindvang, & Beck
	Music ensembles	Principles of PBL and their application in music courses	2018, Laprise
	Music teaching in Special Education	Training for music teaching using PBL in Special Education classrooms	2018, Wanamaker*
	Music and movement	Interdisciplinary and integrative approach of movement as a vehicle for PBL	2018, Wilcox*

5. Discussion and conclusions

Interweaving the results set out above with the literature on composition identifies valuable intersections that we believe contribute to defining music learning through composition. Right away, student-centered learning stands out, interconnecting PBL and composing as a pedagogical and musical trajectory from both the philosophical and the educational perspectives within the constructivist paradigm (Webster, 2011). This is reinforced by a set of formulations, such as those relating to its definition as an approach model, the teaching-learning process, the effects on skills acquisition, the assessment process, and tensions and challenges, factors that in the previous chapter guided the collected readings regarding the study of PBL and within the context of music. In summary, we would highlight the beliefs that underpin the definitions applied to both PBL and music learning through composition: perceived as approaches that facilitate motivation and the development of meaningful learning (Rusinek, 2012; Waters, & McCracken, 1997). Furthermore, the identification of the composing process with problem-solving generates educational implications, particularly regarding that described as one of the most complex and challenging aspects for educators and researchers: definition, conception, and problem design (Hung, 2006; Maudsley, 1999; Mauffette, *et al.*, 2004; Savery, 2006; Savin-Baden, & Major, 2004; Schmidt, *et al.*, 2011).

Cooperative work (Hmelo-Silver, 2006; Mennin, 2007; Schmidt, *et al.*, 2011) and the role of the teacher as a guide and "facilitator" (Horsington, 2018; Lindvang, & Beck, 2015; Vasconcelos, *et al.*, 2016) characterize both approaches across various practical applications. There is already a considerable number of reported experiences of music learning through composition even when not explicitly associated with the PBL model (Berkley, 2004; Burnard,

& Younker, 2004; Veloso, 2017; Wiggins, 1994/2003). Forms of questioning and reflection, such as creative thinking, feature in the literature on PBL (Lubart, & Mouchiroud, 2003) and composition, with the latter particularly associated with CPS in studies like those of Berkley (2004) and Kuzmich (1987). As a particularly challenging subject in music learning, what the literature reports reinforces not only the relationship between problem-solving and discovery processes, upon which the construction of meanings and significance also depends (Hickey, 2003; Veloso, 2017; Webster, 1991; Wiggins, 1994/2003), as often portrayed in the literature, but also the connection between these processes and the conditions necessary for fostering *divergent thinking* (Barrett, 2003; Burnard, & Younker, 2004; Odena, 2018; Sawyer, 2003; Wiggins, 2003). Connected to those phenomena are processes such as *thinking in sound*, *thinking in music*, and *audiation*, which the literature also views as ways of constructing meanings whether of a cognitive, emotional, social, or cultural nature.

The mobilization of prior knowledge by students is considered a fundamental factor for the conception and planning of problems within the PBL context although sufficient empirical data have not yet been found for its implementation and support (Blumenfeld, *et al.*, 1991; Mauffette, *et al.*, 2004; Schmidt, *et al.*, 2011). The translation of this issue into the educational realm of music seems to be encapsulated in the principle of *sound before symbol,* often invoked in the literature associated with music learning through problem-solving, which include student-centered pedagogies and processes of listening, expression, discovery, and sound exploration (including those related to the body, movement, and singing) as well as improvisation and composition (McPherson, & Gabrielsson, 2002; Mills, & McPherson, 2006). The importance attributed to holistic experiences, specifically by authors who have extensively researched music learning through composition, such as Wiggins (1994/2003) and Hickey (2003), interrelates both with the approach to the 'real' world (ideal environment for PBL implementation) and with the interdisciplinary aspects required in the PBL model-based designs and practical contexts and environments. The idea that, in music learning, meanings are constructed from phenomena perceived as wholes, in keeping with the *Gestalt* principles and cognitive theories (Dewey, 1937/1997; Reimer, 2022; Paynter, 2000; Paynter, & Aston, 1970; Rusinek, 2012; Wiggins, 2003) clearly emerges, including empirical evidence, in the creative and compositional experiences implemented by authors such as Wiggins (1994/2003), Bamberger (1977), and Hickey (2003). Alongside that advocated as regards non-formal modes of learning (Green, 2012), these perspectives seem to resonate with those concepts. Indeed, the 'real' context is characterized by diversity and holism, where learning reaches beyond the school environment. Learning music through creation and composition itself involves mobilizing a diverse and interconnected set of skills, such as listening, interpreting, improvising, memorizing, reading/writing (potentially), observing, relating, making decisions, and ultimately, problem-solving. This also relates to the prevailing level of interdisciplinarity. Although the field of music has produced no reports as regards gains in long-term knowledge retention, extrapolations developed by authors such as Blackwell and Roseth (2018), Sarrazin (2018), Strobel and Barneveld (2009), Yew and Schmidt (2012), and Ventura (2014) about self-regulatory phenomena –such as motivation, flexibility in relating to, formulating and dealing with the concrete problems in association with the capacities for comprehension, interest, curiosity, and autonomy– are powerful as they underline and synthesize formulations developed in the pedagogical and musical literature. Once again, we here refer to already referenced concepts, such as the processes of understanding connected to listening and sound thinking, musical thinking, *audiation*, improvisation, and problem-solving skills (Gordon, 2000; Whitaker, 1996; Wiggins, 2003). Also, regarding the promotion of socio-

emotional skills, the studies by Veloso and Carvalho (2012), as well as Wiggins (2003), involving primary school children, allow us to perceive composing as a powerful and transformative experience, impacting not only the cognitive aspect but also the emotional and social dimensions.

Although empirical data regarding the specific study of assessment in musical learning situations through PBL were not found, research carried out in other contexts, especially in higher education, reinforces the validity of peer and self-assessment. These studies provide elements which also allow to verify the reliability of these strategies in non-summative situations (Machado, *et al.*, 2008; Segers, & Dochy, 2010). Lenkauskaite *et al.* (2021) also highlight issues revealed by the study subjects, such as the empowerment felt by the students while active participants in the assessment of the educational process and while self-evaluators of their own participation. The significance of these data for educational reflection in the field of music can be envisioned primarily because they contribute to the consolidation of theoretical formulations, stated, and described, regarding the relevance of learning and assessment in participative and group dynamics and, thus, the application of the PBL model itself as a guide for concrete action plans. In this sense, we revisit, again, the exploratory study conducted (Vasconcelos, *et al.*, 2016), especially one of the syntheses resulting from it, related to the feedback provided by the educator (and researcher) in activities centered on musical creation and on problem-solving, also involving group dynamics. As a matter of fact, the emphasis given and described by the students to that dimension may not only explain the regulatory nature or function of the feedback process but also help to interpret it as one of the plausible factors for the development and implementation of assessment situations in cooperative learning contexts, particularly in the field of music.

Finally, despite all the findings here reported, this literature review did not involve an assessment of the validity and reliability of the analyzed studies. Given this limitation, there is a need for focused and more comprehensive research on the issues discussed.

In conclusion, this article sought to deepen the understanding of the PBL concept as an active, holistic, and learning management process that highlights cooperation, teachers as "facilitators", and the formative nature of assessment in conjunction with other important ideas such as self-regulation, lifelong learning, and reflective, critical, and creative thinking. Another objective, based on a set of constructs and assumptions about musical learning through composition, reflected in both the pedagogical and the scientific literature, as well as curriculum documents and emerging practices, involved identifying bridges and connections capable of confirming and substantiating the PBL model as an organizer of learning process focused educational actions. From the researched and intersected data, six core points deserve highlighting.

The first stems from how, considering the data available and the literature analyzed, support for PBL regarding its constructs and principles continues to be more closely connected with theoretical and pedagogical studies than empirical findings, which also conditions the nature of the conclusions formulated for the musical and educational dimension under study.

The second encapsulates how PBL, although not at the same pace as other fields of knowledge, has generated interest in studying and debating in music even if less extensive in terms of the role of composition as a pathway to solving challenges. As in other contexts, this also replicates the most reported constraints –despite the value placed on the model's theoretical assumptions– given the complexity it entails as a planning instrument, time and scope of

implementation, the subjective and intersubjective nature of the actors, the short and long-term verification of results, and the need for ongoing research.

The third relates to the observation that what might constitute a challenge or learning problem in music spans areas such as composition, instrumental interpretation, music teaching, ethnomusicology, music history, theory, and appreciation, etcetera. This allows for the confirmation of another of the facets that motivated this study: the perception that expository and teacher-centered models, although prominent in music education as they are shaped by the practices emphasized in conservatories and artistic schools, and especially in Portugal, may not be sufficient to meet the complex and diverse demands of what constitutes, in contemporary culture and society, learning and knowing music. The debate over defining just what constitutes musical literacy, inherently justifying the need for this present research, immediately intersects with this problem while generating clues about what may encompass and underlie the design of music learning problems. Indeed, the assertion that learning to know and knowing to make music encompasses, among other aspects, competencies that reach beyond the exclusive interpretation of repertoire by memory, performative and notational virtuosity, almost always centered around the individual perceived and primarily valued as a soloist –and which reflect equally in the most common modes of teaching– encounters continuity and resonance, if not outright support, in the PBL principles and studies applied to music learning. There is also the interrelated realization that self-regulatory processes also appear to arise from shared learning situations that an emphasize cooperation. This returns insights, and empirically substantiated (including in the musical domain), into the meaning of learning in a group context, especially as regards that which also translates into the mobilization of *creative* and *critical thinking* in the field of music education and alongside the management of motivations applied to solving task posed challenges.

The fourth factor, directly addressing the main issue of this research, approaches the specific process of composing, which is identified in the educational literature, albeit not specifically versed in PBL, as a means of problem-solving. A concept that, by incorporating the philosophy of that model, addresses the primary hypothesis raised and inferred from relatively numerous sources and concepts: learning music through composition, while not presented as a theoretically organized and structured epistemological model structured to pedagogically support and guide student-centered music teaching paths and approaches from different authors, nevertheless reflects and embodies ways of conceiving and acting in education that identify and connect with the paradigm underlying and grounding PBL itself.

As the fifth study summary point, the processes of thinking and meaning construction, intrinsic or inherent to the challenge-solving experience enhanced by the act of composing, as described and practiced in different pedagogical texts and contexts, such as thinking in sound, sound before symbol, improvisation, audiation, some of which integrate components of the widely recognized music curriculum or teaching methods, can be clarified, discussed, structured, and implemented from an epistemological and educational perspective through reflection and study of the model. Specifically, the processes and pathways on which the construction and definition of problems occurs are not just relevant but also critical.

The sixth and final conclusion derives from all the above and addresses the issue in this study pertaining to the practical implications aimed at the development, enhancement, and study, in real teaching contexts, of *musical* and sound thinking, learning music through seeking and discovering responses to problems and challenges, through cooperation and sharing. This emerges

in conjunction with the didactic designs that, based on the data obtained and continuous study, seem able to assist in promoting creative and critical thinking in music, issues that have never held such a high profile in educational debates around the world. Indeed, it is pertinent to argue that learning music through pathways engaging with these processes enables us to grasp music learning through composition as one of the itineraries for the educational context of music within PBL itself. Thus, while acknowledging the limitations of the present study, as previously reported, this summary point clearly supports the sheer relevance of considering PBL not only as a consistent theoretical instrument but also as a guiding model for instructional designs and educational actions that set out to develop and study musical learning through challenges and composition.

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MONOGRAPH

Creativity in current music education: A review from school levels and teacher training

La creatividad en la educación musical actual: revisión desde los niveles escolares y la formación del profesorado

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Abstract

This study analyzes the participation of creativity in current school music education through a systematic review of the most recent scientific literature. The review, guided by the PRISMA protocol, started from a bibliographic search in the indexed databases WoS, Scopus and ERIC, using the keywords *creativity* and *music education*. The final sample of selected studies was 57, being determined by all articles published in the last ten years and carried out in the field of school music education and/or initial teacher training. For analysis, data on the study population, educational level, type of study, descriptors and most relevant findings were collected in tables. The results showed the interest of the scientific community in music teachers and their limited promotion of creativity. Despite this, innovative musical and sound creation projects have emerged characterized by interdisciplinarity, collaborative creation, the use of digital technologies and openness to new sounds.

Keywords: Creativity; Music Education; Elementary Education; Music Teachers.

Resumen

Este estudio analiza la participación de la creatividad en la educación musical escolar actual a través de la revisión sistemática de la literatura científica más reciente. La revisión, orientada por el protocolo PRISMA, partió de una búsqueda bibliográfica en las bases de datos indexadas WoS, Scopus y ERIC, empleando las palabras clave *creativity* y *music education*. La muestra final de estudios seleccionados fue de 57, quedando determinada por todos los artículos publicados en los últimos diez años y realizados en el campo de la educación musical escolar y/o formación inicial del profesorado. Para su análisis, se recogieron en tablas los datos de población de estudio, el nivel educativo, el tipo de estudio, descriptores y hallazgos más relevantes. Los resultados mostraron el interés de la comunidad científica por el docente de música y su escasa promoción de la creatividad. Pese a ello, han emergido proyectos innovadores de creación musical y sonora caracterizados por la interdisciplinariedad, la creación colaborativa, el empleo de tecnologías digitales y la apertura a nuevas sonoridades.

Palabras claves: creatividad; educación musical; educación elemental; profesorado de Música.

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1. Introduction

Numerous studies have shown that creativity should be encouraged in education, even having its place in school curricula around the world as it favours the integral development of the child both cognitively and emotionally (Cremin, & Chappell, 2021). However, schools do not sufficiently promote divergent thinking, despite the fact that, from the field of psychology, it is considered to be related to creativity and its contributions to human development are relevant (Jaquith, 2011; Kim, 2011). One way of doing this is through musical creativity (Mawang, *et al.*, 2020).

Music pedagogy has also pushed for learning through creative activities, such as improvisation, creation or musical and sound recreation, and proof of this are the works of the creative music pedagogy currents of the mid-20th century, with outstanding figures such as Schafer, Paynter or Self (Romero, 2015). The success of the involvement of creativity in music education depends to a large extent on the work of teachers. Recent studies show that the current practices of music teachers do not foster creativity (Tan, *et al.,* 2019) and that this problem is related to current initial teacher education (Randles, & Tan, 2019).

Since the first review of creativity in music education by Richardson (1983), whose studies were mainly based on the assessment of musical creativity from a psychological approach, no review studies have been found that generally collect research on creativity in school music education. Within this field, there are several reviews, such as that of Stambaugh and Dyson (2012) which focuses on the interests and concerns of teachers and future music teachers, that of Larson and Georgii-Hemming (2019), based on the teaching and learning of improvisation, or that of Alves-Oliveira *et al.* (2022) which delves into creative interventions with children in different contexts, but they do not provide a comprehensive understanding of the role of creativity in school music education. Moreover, the last ten years have seen an increase in scientific production on creativity and education in music education (Cremin, & Chappell, 2021).

Faced with this phenomenon of growing interest in the scientific community and educational policies, a series of questions arose that guided this research: What are the theoretical contributions made by the latest empirical studies on creativity in music teaching in school? Is there any correspondence between current music education curricular proposals on creativity and teaching practices? What are the contributions of recent literature on music teachers' competences related to creativity? What advances are there on the knowledge of methodologies, strategies and resources at the service of music teachers to favor creativity? Are there any current studies that corroborate the importance of creative music learning? What are its pedagogical foundations and guidelines? What is the nature of the successful innovative creative projects in which music education has participated in recent years? What is the role of new technologies in current creative practices in music education? What is the scope of creative experiences in music education that have been based on new contemporary musical and sound languages? How has higher education adapted to provide future music teachers with the necessary competences to favor creativity in their professional performance? Furthermore, our main objective is to analyze the involvement of creativity in current school music education through research published in the last ten years, in order to provide guidance to researchers and practitioners using a systematic literature review approach.

2. Method

2.1. Design

This is a systematic review study of the literature published in the last ten years on the presence of creativity in music education at the pre-school, primary and secondary stages and in the initial training of future teachers. This review is guided by the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) protocol (Page, *et al.*, 2021).

2.2. Sample

Fifty-seven articles published in scientific journals were selected. The inclusion criteria were the following ones:

- Studies in school music education where creativity was present in their objectives and/or results .
- Studies completed at pre-primary, primary or secondary education and higher education (initial teacher training).
- Peer-reviewed scientific articles with access to the full paper.
- Articles in Spanish, English and Portuguese, as the main languages of publication in the field.
- Articles published between 2014-2023.

The exclusion criteria were:

- Review articles.
- Higher education other than teacher training, conservatories and music schools.

2.3. Procedure

The search was conducted in June 2023 in the WoS, Scopus and ERIC databases. The syntax used in the first search was: *creativity AND "music education"* (n=1548). This first search was filtered, using the filters provided by the same databases, by year of publication from 2014 to 2023 (n=942), by language of publication (n=918) and by type of document, selecting only scientific articles (n=727). The results were then filtered to select studies conducted at the levels of education marked by the selection criteria (n=115) on the search syntax: *creativity AND "music education" AND ("childhood education" OR "primary school" OR "secondary school" OR "teacher training"*). Then, duplicate studies were removed (n=78), and the resulting records were reviewed by reading the full texts, the sample being adjusted to the selection criteria (n=52). Finally, other articles included within the references of the articles returned by the search were added.

It is worth mentioning that the entire search, screening, eligibility and inclusion process was reviewed by the two authors independently and, once the sample was obtained, all articles were checked for compliance with the selection criteria by reading the full articles, thus avoiding sample and publication bias.

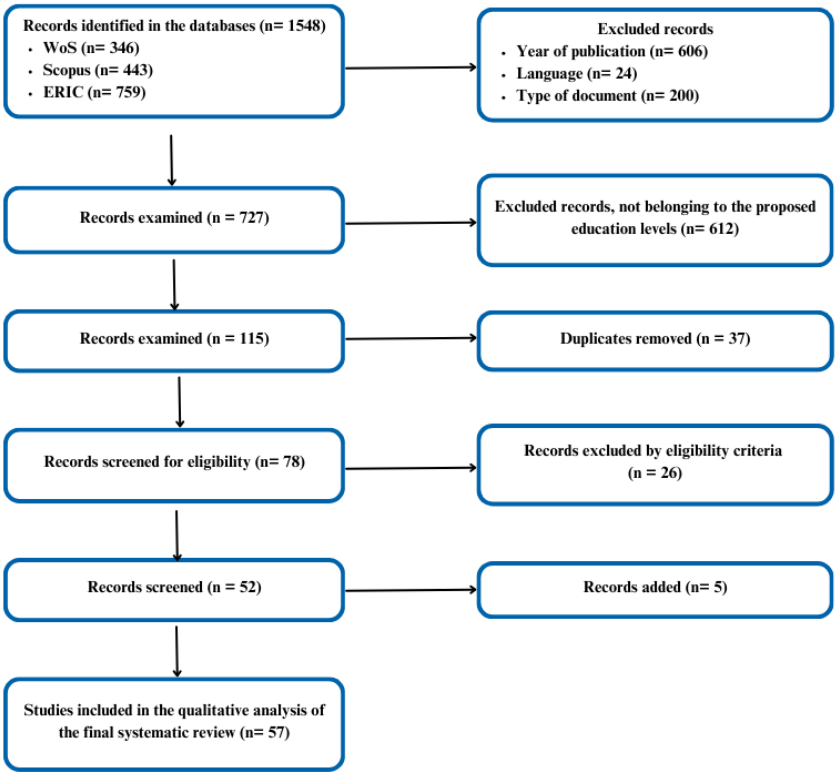

Figure 1. Phases of the oriented filtering process in the PRISMA protocol

To facilitate the synthesis and analysis of data, a table was created in which the following data was collected for all the articles: title, author/s, year of publication, language of publication, country where the study was carried out, type of study, study population (Pre-school, Primary or Secondary School students, acting music teachers or Teacher Training students), educational context in which the study was carried out (Pre-school, Primary, Secondary or Teacher Training), key words, theoretical or methodological contributions and most relevant results.

3. Results

The studies that make up this review (n=57) were published between 2014 and 2023, and were developed in countries around the world, with the majority being European (n=32). The most common language used is English (n=48), followed by Spanish (n=9), with no articles in Portuguese meeting all the criteria. With regard to the type of studies, they are mainly descriptive studies, comprising 81% of the sample, compared to 12% of experimental or quasi-experimental studies and 7% of correlational studies.

The educational contexts studied in this research are the educational stages of Early Childhood, Primary and Secondary Education, and the university teacher training courses. The 84% are focused on a single stage, with Primary and Secondary contexts being the most studied and Early Childhood Education the least studied. In terms of study populations, the majority were students in early childhood, primary or secondary education (54%), followed by music teachers (29%) and teacher training students (17%).

In order to analyze the study sample, the most frequent keywords were selected from all records and synthesized into a list of 15 descriptors. In this list, the keywords "creativity" and "music education" were not included, as they characterize all the articles. Neither were those defining the study population or the educational context in which the studies were carried out selected, as these variables would later be related to this list.

Table 1. Most representative descriptors according to keywords

DESCRIPTORS	N	%
Educational project or intervention	39	67
Educational innovation	38	66
Methodologies	38	66
Experiential learning	34	59
Teaching skills	26	45
Interdisciplinarity	24	41
Integrated arts	20	34
Sound based music	20	34
Collaborative learning	19	33
Technology	13	22
Psycho-pedagogical assessment	13	22
Cognitive skills	13	22
Curriculum	11	19
Socio-emotional well-being	11	19
Education policies	10	17

Subsequently, these descriptors were related to the data on the population and context of the study, resulting in four blocks or categories that define the sample. Although many of these studies could belong to several blocks, they were associated with only one in order to facilitate the synthesis, leaving it in the one with which there was the strongest link according to its objectives and/or most relevant results. These blocks are:

- Creativity, curriculum and policy in music education (n=4).
- Music teachers and creativity: beliefs, strategies and training (n=25).
- Creative, musical and innovative projects (n=18).
- Creativity, psycho-pedagogical variables and music education (n=10).

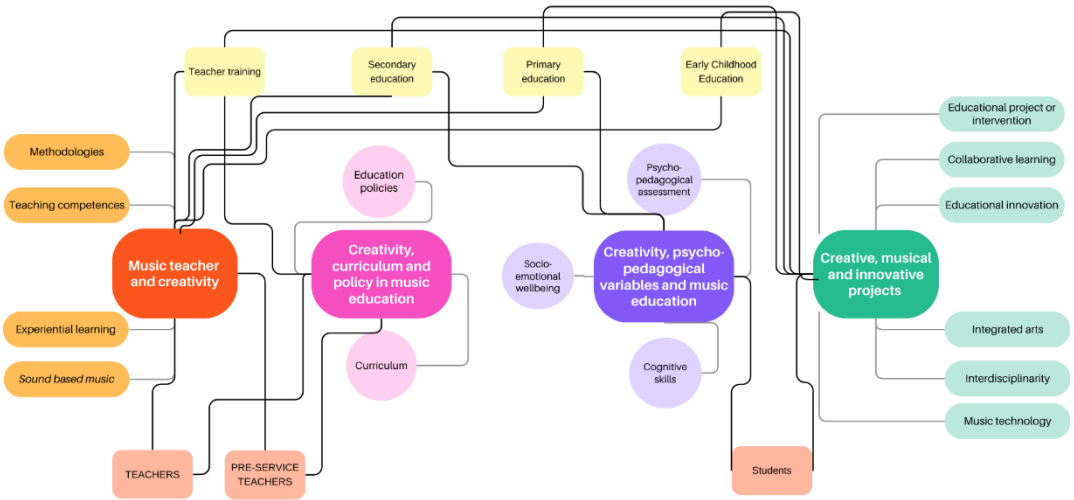

Figure 2. Conceptual map of categories and descriptors for the selected set of articles

3.1. Creativity, curriculum and policy in music education

Being the category comprising the fewest records in the sample (n=4), these analyse the relationship between educational legislation, the music curriculum, teaching practices and music teacher training with creativity as a cross-cutting aspect. In the case of England (Hennessy, 2015), creativity has an important role in the music curriculum, however, it does not have the same involvement in teaching plans. The new learning standards for music education in the United States, proposed by NAFME in 2014, emphasise the artistic processes of creation, performance and response (Kim, 2017). In Wales, the latest education reform brought in a competency-based approach and supported learning from creative experiences (Breeze, *et al.*, 2023). And in Spain, initial teacher training curricula were analysed in relation to the Music curriculum in primary and secondary education, indicating that there is a need to orient this training towards creativity, citizenship and lifelong learning (Blanco, & Peñalba, 2020).

3.2. The music teacher and creativity: teacher profile, strategies and training

This category contains the most articles (n=25) and encompasses all the studies that considered creativity as a necessary aspect in the profile of the 21st century music teacher. This profile enables the implementation of innovative teaching methodologies, strategies and resources that favour creative processes in the classroom, as well as creative pedagogies that facilitate music teaching. These studies also show the importance of initial teacher training in the development of key beliefs and competences for the shaping of this profile (Carrillo, & Vilar, 2014).

Furthermore, students' low interest and appreciation of music seems to be related to directive teaching strategies based on traditional expository and interpretative models and away from active and creative methodologies (Chen, & O'Neill, 2020; Ho, 2022; Mochere, 2017). In terms of the type of activities, music and sound creation is the least represented in music classrooms (Bogojević, & Pance, 2022; Riaño, *et al.*, 2022; Sungurtekin, 2021; Svalina, & Sukop,

2021). The importance of creativity assessment in facilitating creative activities, both in their process and product, is also highlighted as it relates to music teachers' beliefs (Kokotsaki, & Newton, 2015; Bolden, & DeLuca, 2022; Devaney, 2023). Thus, it is evident that there is a need to renew teaching practices in favour of creative teaching and learning, through the recognition of children's creative processes and offering a diversity of imaginative experiences (King, 2020), incorporating creative musical play in an environment of freedom that favours exploration and sonic experimentation (Adams, & Beauchamp, 2021; John *et al*, 2016; Peñalba, *et al.,* 2021), with engaging resources (Arriaga, *et al.*, 2021; Hart, 2017) and integrated approaches (Lau, & Grieshaber, 2018).

The conclusions of these studies reaffirm the importance of training future teachers to ensure the presence of creativity in music classrooms. Furthermore, within this category we find studies that have specifically investigated initial teacher training (n=7). Abramo and Reynolds (2015) indicated the need to offer creative pedagogy in music teacher education in a transversal way or through specific courses (Fekete, *et al.*, 2022). Others indicated that the development of creative practices in music teacher education can help to improve confidence in their musical skills and transform the preconceived beliefs of future teachers towards creative learning (Murillo, & Tejada, 2022). There are also studies that highlighted the importance of generating creative and innovative experiences in teacher training, initiatives and collaborative spaces to improve teaching competences where creativity is the starting point (Arriaga, *et al.*, 2019; Berbel, *et al.*, 2020; Ocaña-Fernández *et al.*, 2020). And in other innovative experiences of in-service teacher training (Hendriks, *et al.,* 2023), the effects of *Video Feedback Coaching* to support music teachers' verbal and musical creative autonomy were investigated.

3.3. Creative, musical and innovative projects

The following are all studies based on creative projects which, although they are part of teachers' work and reflect their good practice, deserve a separate category because of their interdisciplinary and innovative nature. It should be noted that all of them were mainly carried out in the context of Primary (n= 9) and Secondary (n= 10) education and that many of these projects belong to national and international research projects. Interdisciplinarity, collaborative learning, the use of new technologies and openness to new artistic languages through work with sound mark the identity of these innovative projects.

Communication and collaboration between the scientific and educational community is very present in current educational projects, many of which are based on the STEAM (Science, Technology, Engineering, Arts & Mathematics) movement, where scientific and creative processes are generated from musical and sound experimentation (Ben-Horin, *et al.*, 2017; Gershon, & Ben-Horin, 2014; Ito, & Nakayama, 2014; Viñas, *et al.,* 2022). The use of digital technology to facilitate and enrich creative processes is present in almost all of these projects (Aaron, *et al.,* 2016; Dannenberg, *et al.,* 2023).

In turn, these collaborative creation projects are mediated in many cases by artists and musicians, based on the importance of multiple creativities and with socio-cultural perspectives (Viig, 2019; Waddington-Jones, *et al.*, 2019), even generating learning communities (Whitaker, 2016) that favour educational and creative processes. In turn, this type of creative projects through

mediation provide benefits to students on a socio-emotional level (Bautista, *et al.*, 2018; Žnidaršič, 2020).

Creative experiences were also carried out with an integrated arts approach (Yelo, 2018) and openness to new sonorities and current artistic languages (Murillo, *et al.*, 2019), favouring social inclusion (Duarte-García, & Sigal-Sefchovich, 2019). Other music creation projects allowed us to understand learning processes, such as participatory creativity, based on fixed and moving visual supports (Lage-Gómez, & Cremades-Andreu, 2018, 2020, 2021; Cremades-Andreu, & Lage-Gómez, 2023).

3.4. Creativity, psycho-pedagogical variables and music education

This category includes those studies, mostly experimental or quasi-experimental, in which the aim is to evaluate creativity or some of its components, or to search for the relationship between creativity and other psycho-pedagogical variables involved in music learning. Most of these studies have been carried out in the educational context of Secondary (n=5) and Primary (n=4) Education and some at University (n=1), with no studies in Early Childhood Education.

The elements of creativity that co-influence music learning were studied, concluding that collaborative creativity supports musical learning and enhances a sense of well-being (Burnard, & Dragovic, 2015). There is a relationship between musical self-concept and creativity in students, indicating that positive musical self-concept tends to foster musical creativity (Mawang, *et al.*, 2019), between students' creativity levels and their musical achievement or attitudes (Kibici, 2022) and between achievement goal motivation and musical creativity (Mawang, *et al.*, 2020).

Studies such as Fazaie and Ashayeri (2018) reaffirmed that music teaching in primary school through creative activities influences children's creativity and that methods using it are effective for music learning, such as the study of the positive effect on children's creativity through a music education intervention in primary school based on the Theory of Multiple Intelligences (Yeşilkaya, & Töreyin, 2022).

In terms of the use of teaching techniques and resources, Zhang (2023) demonstrated the effectiveness of musical improvisation in the development of creative thinking in secondary school students. Wong and Lim (2017) concluded that musical compositions created by primary school students can be more creative through the use of mental imagery. The *Aytürk* technique, used within a programme of creative activities in music classes, was found to have a positive effect on students' creativity (Ertürkler, & Bagci, 2019).

4. Discussion and conclusions

This review study, which set out to understand the role of creativity in music education today through the most recent research, yielded a number of results. The most recent literature on this topic is still concerned with clarifying the processes and elements that accompany musical creativity, but also how these influence music learning. But it is also interested in the implications of current educational reforms on the teaching of music for creativity, investigating the teaching

practices and profiles that favour creative music learning, also from the point of view of teacher training, and disseminating innovative educational projects based on musical and sound creation.

These studies develop their research mainly in Primary and Secondary Education, but there are few studies in Early Childhood Education. Although the study of musical creativity in early childhood from its psychological dimension has been and continues to be a very profuse field of research, it seems that it is not so profuse from its pedagogical dimension. This scarcity of studies in Early Childhood Education in the field of school music education may be related to teacher training (Díaz, 2005).

Another of the results of this research is the growing interest of the scientific community in recent years in the adaptation of teaching practices to the educational principles and methodological guidelines related to creativity in basic education curricula (Hennessy, 2015; Blanco, & Peñalba, 2020). Globally, with the turn of the century, education systems began to look more than ever towards creativity, promoting the development of creative competences in the school stage and thus adapting to the social and cultural needs of the 21st century. However, it seems that the reality in general music education classrooms is different and creative pedagogies still have little involvement compared to other more traditional teaching models (Bogojević, & Pance, 2022; Riaño, *et al.*, 2022; Sungurtekin, 2021; Svalina, & Sukop, 2021). Therefore, teacher involvement is necessary and teachers need urgent support to improve their pedagogical approaches and promote students' creativity (Tan, *et al.*, 2019).

Many of these studies also pointed to the profile of music teachers, with their thoughts, beliefs, skills and abilities as determinants of the presence of creativity in their teaching performance. Certain personal characteristics of creative pedagogues have been recognised (Abramo, & Reynolds, 2015), but also music teachers' beliefs about creativity, which are marked by myths and stereotypes that can negatively affect the performance of creative activities, as well as their assessment (Mullet, *et al.*, 2016; Odena, & Welch, 2009). It is also highlighted that initial teacher education can contribute to this creative profile of the music teacher by providing future teachers with the necessary competences to address the creative needs of today's education (Grossman, & McDonald, 2008).

In turn, and despite the fact that according to these studies the participation of creativity in music classrooms seems to be scarce, the most recent literature reports the success of innovative projects within the framework of music education whose hallmarks are the collaborative creation, interdisciplinarity, the use of digital technologies and openness to sound and new languages of music. Understanding that human abilities to coordinate activities with others, in a collaborative or cooperative way, emerge from an early age, giving identity and a sense of belonging (Barret, 2014), that collaborative composition has a strong impact on well-being (Waddington-Jones, *et al.*, 2019) and that these elements favour music learning (Burnard, & Dragovic, 2015), it seems indisputable that collaborative creation is the model of choice for the most current innovative projects.

On the other hand, the technological development of the last decades has influenced the teaching and learning processes, and an example of this is the notable participation of technology in the most recent research on creativity in music education. In this educational field, technology has significantly transformed the practices of sound creation and musical composition with the incorporation of new hardware, software and other digital tools, these resources favouring the

methodological processes for such creation (Chen, & O'Neill, 2020). The use of technology in music and sound creation projects has demonstrated greater student motivation towards such creation, an openness of students towards different musical styles and sensitivity towards sound (Murillo, *et al.*, 2019), indicating in some cases the need for teacher training in the use of these technologies.

Many of the collaborative and interdisciplinary creation projects found in recent research in the field of music education are based on an integrated arts approach where music, together with dance, poetry or audiovisual arts, work towards a common goal through creation or by seeking artistic creation in itself. In this way, working from the integrated arts allows a methodological approach that uses art as a way of discovering the world, integrating the knowledge of the different artistic disciplines in the creative process, promoting and building integrated knowledge in them (Faria, 2022). As an extension of collaborative and interdisciplinary creation, it is also relevant to mention how Sound Based Music[3] (Landy, 2007) is progressively approaching music classrooms, as shown by recent research (Murillo, *et al.*, 2019; Waddington-Jones, *et al.*, 2019). This creative and interdisciplinary vision from the integrated arts brings an innovative approach to teaching practices, also having its scope in initial teacher training (Berbel, *et al.*, 2020).

Another aspect that defines the creative landscape of music education today is the opening of these creative and innovative projects to the participation of other professionals, thus crossing the boundaries of the school to other spaces such as cultural and artistic mediation. The support of creative professionals, such as qualified mentors or arts organisations, allowing for dialogue and joint construction of knowledge with teachers, can be a favourable way to promote creativity in the classroom (Gandini, *et al.*, 2005).

In summary, the studies show that researchers' interest continues to focus on the phenomena that accompany creativity in the processes of teaching and learning music and vice versa, as in previous decades, but incorporating new concepts such as collaborative creation, interdisciplinarity, integrated arts, creation as a process, multiple creativities, mediation or technology at the service of these processes. The concern for the teaching task, as the one directly responsible for the existence of creativity in music classrooms, is also present in these investigations, which contribute to the design of the music teaching profile that facilitates creative processes and call the attention of higher education to guarantee the competences in creative pedagogy of future music teachers. Although the studies that have investigated teaching practices and strategies maintain that music teachers currently promote few creative practices in their classes, there are innovative creative projects that are opening the doors of creativity to music and art education.

Finally, as limitations of this study, it is mentioned that the literature search in other databases could have yielded other results, that only articles in English and Spanish were selected, and that the selected studies were all successful, thus affecting the bias of the sample.

As a prospective, the research community is invited to look more deeply into the scope of creative pedagogy in general music education, but especially in the Early Childhood Education

[3] A term coined by Landy (2007) and defined as "an art form in which sound, rather than the musical note, is the basic unit" to encompass different works based on electroacoustic music.

stage, as this is a very important aspect for the integral development of children and is a field in which few studies have been found.

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MONOGRAPH

Analysis of an intergenerational music education project in initial teacher training: a case study

Análisis de un proyecto de educación musical intergeneracional en la formación inicial del profesorado: un estudio de caso

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Abstract

This article analyses the experience of an intergenerational music education project aimed at a group of dependent elderly people, with the participation of primary school pupils and led by a group of university students, future music teachers. Numerous studies reveal the positive impact of music on physical, cognitive, and emotional abilities in old age. This is a stage of life in which an increasing percentage of the population find themselves in a situation of vulnerability and social exclusion. Employing qualitative methodology, a triangulation of sources has been carried out through the use of various data collection techniques and instruments: logs, interviews, a research diary, and document analysis. The results reveal that the project, through the mediation of music, has favoured the elderly participants' (re)cognition, an improvement in their well-being and their social inclusion as a group. It has also fostered the emergence of civic values in children and preservice teachers, elements necessary for a fairer and more egalitarian society. Finally, the encounter between generations made it possible to create a space for dialogue, encounter, and community participation.

Keywords: Intergenerational Programs; Music Education; Elderly; Preservice Teachers.

Resumen

Este artículo analiza la experiencia de un proyecto de educación musical intergeneracional destinado a un grupo de personas mayores dependientes, donde participa alumnado de Educación Primaria, y dirigido por un grupo de estudiantado universitario, futuros maestros y futuras maestras de Música. Numerosos estudios revelan el impacto positivo de la música en las capacidades físicas, cognitivas y emocionales en la etapa de la vejez. Una etapa donde cada vez se concentra un mayor porcentaje de población en situación de vulnerabilidad y exclusión social. A través de una metodología cualitativa, se ha realizado una triangulación de fuentes mediante el empleo de diversas técnicas e instrumentos de recogida de datos: bitácoras, entrevistas, diario de investigación y análisis de documentos. Los resultados revelan que el proyecto, a través de la mediación de la música, ha favorecido el (re)conocimiento de las personas mayores, la mejora de su bienestar y su inclusión social como colectivo. También ha permitido aflorar valores cívicos en los niños y las niñas y en docentes en formación, necesarios para una sociedad más justa e igualitaria. Finalmente, el encuentro entre generaciones ha posibilitado la creación de un espacio para el diálogo, el encuentro y la participación comunitaria.

Palabras claves: Programas intergeneracionales; educación musical; personas mayores; formación del profesorado.

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1. Introduction

The population of the European Union (EU) is undergoing a considerable demographic aging over the coming decades. The age pyramid is being inverted by consistently low birth rates and increasing life expectancy. Forecasts indicate that the percentage of people aged 80 and over in the EU population will multiply by a factor of 2.5 between 2019 and 2100, going from 5.8% to 14.6% (Eurostat, 2021a). The population aged 65 and over, which currently makes up 20.1% of the total population in Spain, will reach a peak of 30.4% around 2050 (INE, 2022). Consequently, the proportion of elderly people in the total population will increase significantly over coming decades. The forecast for this growth highlights the importance of active and healthy aging to ensure that people live longer in good health and can continue to live independently (Eurostat, 2021b). When life expectancy goes beyond 65 years of age, a higher number of the elderly live alone, isolated or suffering from depression (Cabañero-Martínez, *et al.*, 2007).

Numerous studies confirm the benefits that music provides to the cognitive, physical, affective-emotional, and social spheres of human beings in their development process (Hallam, & Creech, 2010, 2016). Of all life's phases, old age is the least studied in this respect despite the fact that music can be a source of social cohesion, pleasure, personal development, self-regard, positive health and empowerment (Cohen, 2009; Cohen, *et al.*, 2006; Southcott, 2009; Taylor, & Hallam, 2008). Active participation in group musical activities can offer this age group numerous benefits in terms of memory and attention (Creech, *et al.*, 2013a; Perkins, & Williamon, 2014) as well as linguistic skills (Halam, 2017), among others. At the psychological level it can particularly improve their independence, vitality, empowerment, resilience, and feelings of fulfilment and validation (Chené, & Sigouin, 1995; Sixsmith, & Gibson, 2007), as well as combating loneliness, isolation, and depression (Creech, *et al.*, 2013a; Clift, *et al*., 2010; Daykin, *et al.,* 2018; Varvarigou, *et al*., 2012), favouring a more positive and pleasant mindset (MacDonald, 2013). On a physical (Clift, *et al*., 2010; Skingley, & Bungay, 2010; Varvarigou, *et al*., 2012) and social level benefits derive from the interaction that collective music involves (Costa, & Ockelford, 2018; Tymoszuk *et al*., 2020), improving cultural identity (Joseph, 2009) and interpersonal relationships (Paolantonio, *et al*., 2023). Staying active is of the utmost importance during aging, carrying out activities and having routines that ensure psychological, cognitive, and physical well-being (WHO, 2002; Rowe, & Kahn 1997). Musical activities can provide learning opportunities and novel elements capable of improving the quality of life and well-being in older people (Creech, *et al*., 2013a; Lo, 2015; Rohwer, & Coffman, 2006; Hallam, & Creech, 2016). Thus, aging can be slowed (Hays, & Minichiello, 2005), be both positive and productive (Anetzberger, 2002; King, *et al.*, 2016), and be lived with dignity and independence (Hallam, *et al.*, 2014).

However, rather than seeing the elderly as being merely dependent, the later stages of life could be thought of as a time for developing interdependence, as they can be an enriching resource of knowledge and skills that can be developed in intergenerational exchanges (Findsen, 2005), such encounters could, through the mediation of music, benefit both the old and the young. Such encounters could improve the well-being and quality of life of the former (Creech, *et al*., 2014), by providing them with pleasure, joy, relief, and an escape from feelings of isolation and depression associated with these ages (Brownie, *et al*., 2014; Ellis, & Rawson, 2015). For the latter, when it comes to future music teachers, an opportunity is offered to both learn and hone their professional skills, with the consequent positive effects on employability (Paolantonio, *et*

al., 2023). Furthermore, as it involves participation in significant community initiatives, it can promote transformative learning in university students (Berbel Gómez, *et al*., 2020; Perkins *et al*., 2015), in terms of identity, interpersonal relationships and construction of civic and social citizenship (Paolantonio, *et al*., 2023), added to intercultural understanding and intergenerational solidarity (Corrigan, *et al*., 2013). There are numerous international examples in universities that approach music education from a socio-community perspective, by providing students with opportunities to develop their civic and social skills (Feen-Calligan, & Matthews, 2016; Bartolome, 2013; Burton, & Reynolds, 2009). There have also been examples in Spain (Chiva-Bartoll, *et al.*, 2019; Parejo, & Cortón, 2018). Furthermore, when these intergenerational encounters involve not only university students but primary school children as well, the experience allows the latter to participate as citizens and enjoy a new context of relationship with other social actors, especially those with greater vulnerability such as the elderly, developing a common agenda together (Esteban, 2023).

The research presented in this paper seeks to understand how intergenerational music projects can help improve the quality of life of groups of dependent older people. Furthermore, it seeks, firstly, to know how such projects may contribute to the deontological training of university students, future teachers of Musical Education, and secondly, how they contribute to primary school pupils' learning of civic and ethical values. Finally, it proposes to analyse the mediating role of music in the life experience of the participating groups.

2. Methodology

A qualitative paradigm was decided upon for the research, as it is the ideal epistemological approach to both learn about and address the complexity of a reality present in certain behaviours in a holistic and in-depth way (Antwi, & Hamza, 2015; Denzin, & Lincoln, 2008).

2.1. Research design

Given the nature of the study and its objectives/questions, a case study was felt to be the most suitable design. Analysis and interpretation were sought, employing different perspectives and methods, of an "example of action" in its true, proper context (Simons, 2014; Yin, 2009). In line with Stake (1995), this is an instrumental case, developed from an intergenerational musical project, aimed at going deeper hermeneutically into any knowledge gained from the experience by the participating groups. It is, therefore, about evaluating the implications of said project through a detailed description and explanation of the results with a view to making judgments about the reality under study (Pérez Serrano, 2007).

2.2. Context and participants

This study is the result of the research of a project which aims to train future teachers who, in addition to having the appropriate musical and methodological skills (Berrón-Ruiz, & Monreal-Guerrero, 2020), also have the transversal skills, those of a deontological nature, that demonstrate their commitment and involvement in the search for a more just and equal society

(Feen-Calligan, & Matthews, 2016; Westheimer, & Kahne, 2004). The project was developed within the subject of *Didactics of Musical Expression,* part of the 4th year of the degree in Primary Education in the major of Music 1. Following a previous experience (Parejo, & Cortón, 2018), it began in the 2019-20 academic year and continued until 2020-21, when it was suspended in accordance with the restrictive measures imposed by COVID.

This is a Musical Education project that was carried out with two groups of university students from the Primary Education degree (Majoring in Musical Education): the first, composed of 11 men and 21 women, and the second made up of 4 men and 29 women. The project was aimed at a group of 25 elderly people, 8 men and 17 women, aged between 80 and 98, in a situation of dependency, with mild cognitive deficiencies typical of age (loss of memory, attention, verbal comprehension, learning, etc.), living in the same residence (in an urban, charitable setting), who participated on a voluntary basis in both academic years. Also taking part in the project were a group of 14 boys and 11 girls (in the first edition) and 18 boys and 7 girls (the second edition) from the 6th year of Primary at an urban state school. The project used music as a tool to, firstly, promote physical and emotional well-being and help maintain cognitive function in the elderly, as well as assisting their social and community inclusion; and secondly, to develop social, ethical, and democratic values in the group of primary school children and among the group of university students, these values arising as a result of the intergenerational meeting.

2.3 Procedure

The repertoire of musical activities was designed, directed, and implemented by the university students, under the supervision of the two professors responsible for the subject as well as members of the research team, in line with the cognitive, psychological, and motor capabilities of the elderly. The activities took place following previous sessions to meet, familiarize everyone, diagnose, and consider the interests of all participating groups. Each academic year, a total of 8 one-hour sessions of musical activities were organized, coordinated by a group of 5 university students, while the rest of the groups observed and offered support. The activities focused on the three blocks of content present in musical education: listening, musical interpretation, and music —movement— dance, with the aim that the activities, in addition to contributing to the musical enrichment of all participants, fostered awareness and relationships between the various generations (Table 1). Following Morales-Fernández *et al.* (2017), the main musical methodological strategies employed focused on sound exploration and discrimination, imitation (simultaneous/echo), sound games, improvisation-creation, literacy (non-conventional), the creation of graphics, cooperative learning, etc.

Table 1. Programming of musical activities

Content blocks of music education	Description of the contents to be worked on in the activities	Examples of activities
Listening	○ Auditory discrimination and recognition of distinctive features of sound	○ Domino game with differentiation between several instruments with variations in intensity, duration, and pitch
	○ Identification and recognition of a selection of music from different genres	○ Musical bingo to identify rock, classical, hip hop, and zarzuela music

	and styles, and the feelings and emotions evoked	○ Creation of a physical artistic work that shows the emotions and feelings generated by different music
	○ Evocation and recognition of songs and dances from shared cultural heritage	○ Recognition of traditional songs and dances such as *La chica segoviana* or *Jota segoviana*, etc.
	○ Active listening to some musical pieces with the differentiation of their parts through a musicogram	○ Active listening to Strauss's *Radetzky March*
	○ Taste and pleasure in listening to music	○ Relaxation through music
Musical interpretation	○ Interpretation and vocal creation of songs from one's own and other people's cultural heritage, with or without instrumental accompaniment, to achieve an intergenerational exchange of and dialogue about songs between the elderly, students, and children	○ Singing of various songs such as *La tarara*, *Yo soy aquel* (Raphael), *La, la, la* (Massiel), *Malamente* (Rosalía) with the creation of new versions accompanied by small traditional percussion instruments (scrapers, tambourines, wooden spoons, reed flutes, a pestle and mortar, nutshells, bones, cowbells...)
	○ Creation and/or repetition of basic rhythms with body percussion and/or minor percussion instruments	○ "Orchestra Conductor" game with the creation of basic rhythms with body percussion (clapping, thigh-slapping, and whistling) ○ Collective improvisation with body percussion of different types
	○ Making of instruments from odds and ends	○ Instrument-building workshop (cotidiáfonos[3])
	○ Collective improvisation	○ Collective improvisation game with the instruments made and everyday objects (metal and wooden spoons and forks, combs, liqueur bottles, glasses, water flutes, whistles, drinking straws, etc.)
Music, movement, and dance	○ Simple body movements, spontaneous or not, with or without displacement, depending on the motor functions of the elderly and primary students	○ Musical puppet game where the participants make various movements in response to the instrument played
	○ Performance of traditional and non-traditional dances	○ Mirror image game in pairs with movements typical of the jota, hip-hop, waltz, sevillanas...
	○ Preparation and performance of dialogues, songs, movement, and dances	○ Musical theatre with black light

2.4. Techniques and instruments for data collection

The aim of this study is to evaluate the subjective traits of the groups of participating people, their experience, and their interactions (Flick, 2018; Guba, & Lincoln, 1994). Therefore, the following data collection techniques and instruments were used during the two academic years studied:

- Logs of the 55 university students: written reflections in which they analyse individually their experiences in the sessions. Length: 2,500 words. Total number of documents: 440. Structure of the topics derived from the musical activities in the project: a) development of the musicality of primary school pupils; b) physical,

[3] A "cotidiáfono" is a musical instrument made from typical household objects, for example, a yogurt carton with seeds inside.

cognitive, socio-emotional improvement, and well-being of the elderly; c) professional and deontological development —civic and social— of future Musical Education teachers.

- Essay-writing by the 50 children in the 6th year of primary schooling: a written piece where they reflect individually on their participation in the sessions. Length: 500 words. Total number of documents: 200. Structure of the topics arising from the musical activities in the project: a) satisfaction with the musical activities; b) observed social, ethical, and civic values; and c) learning acquired from experience with the elderly and university students.
- Semi-structured interviews with the elderly: each academic year and at the end of the project. Total number: 50. The topics revolved around their satisfaction with the musical activities offered, their relationship with the university students and primary pupils and, finally, the well-being experienced.
- Research Journal: employing an open format, this document presented the technical procedures for data collection, an assessment of the sessions programmed and carried out, and, finally, a follow-up of the ethical criteria, following the stipulations of the *American Educational Research Association* in February 2011 and, particularly, the case study design proposed by Simons (1989).
- Didactic designs: technical documents of the project's sessions and musical activities.

Triangulation of the research was carried out by means of several sources, techniques, and participants, guaranteeing, through confirmation of the data, the reliability and validity of the information (Creswell, 2011). The units of analysis were selected and subsequently associated with the emerging categories (Figure 1), with the support of Atlas.ti software (version 23).

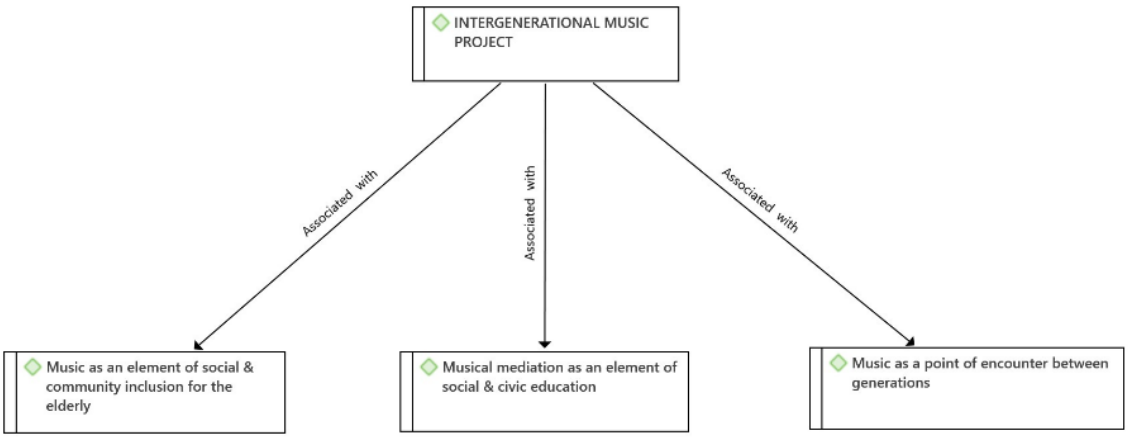

Figure 1. Tree of analysis categories

Table 2 shows the coding system used. To carry out this research, informed consent was obtained from all the participants, adapted to each group, always ensuring the confidentiality of the data and origin of the sources (Sales, & Folkman, 2000).

Table 2. Example of coding of units of analysis

Document #	# of citation in document	Subject	Academic year
7	5	Teachers (P 1) *	18-19**

* Teachers [P1- P2]; university students [U2-U58]; primary schoolers [A59-A83]; elderly people [M84-M103].
**19-20.

3. Results

3.1. Music as an element of social and community inclusion of the elderly

Improving the quality of life and the well-being of elderly people, in addition to their inclusion, is essential for the development of a more equitable and cohesive society. This was the reasoning behind the work done to improve their cognitive and physical well-being: "in many of the sessions we have influenced auditory memory, attention, concentration, language, general coordination and certain motor skills, through various programmed musical activities such as songs and dances" (17:5, in U4, 18-19)[4]. All of this with the purpose of minimizing, as far as possible, the cognitive and physical deterioration of the group. On a psychological level, the starting point was the elderly participants' erroneous and pessimistic initial feelings, such as: "I don't know how to sing anymore, but I used to" (265:3, in M86, 18-19), or: "I like hearing others sing, but I've never sung because I could never hold a tune, although when I was young, I hummed when I was alone" (266:5, in M91, 18-19), "… I'm no longer any good for this or for anything else." (270:7, in M91, 19-20). Moreover, the primary school pupils and university students also recognize their prejudices towards this group: "I thought that old people didn't know how to do anything" (243:3, in A65, 19-20), "although people say that they are useless, it doesn't matter to me, I have a great time with them, singing and playing..." (247:2, in A69, 19-20). "At first, the design of the sessions was very difficult because the pensioners presented great diversity and varying degrees of cognitive and motor abilities, and even of self-confidence" (86:7, in U21, 18-19). However, self-esteem, self-concept and feelings of social affirmation were strengthened after the progressive overcoming of many of these initial limitations: "we have made them see that we were all capable of remembering, singing and drumming" (26:3, in U6, 18-19) or "I was surprised to see that the oldies knew a lot of songs and even some dances" (25:7, in A78, 19-20). However, as one of the university students said:

> After finishing the sessions with the old people, they told me they had enjoyed it, they had been excited and had learned a lot, but not only about music but also to be more positive about themselves, believing they could achieve what they set out to do, despite some limitations (195:9, in U48, 19-20).

An atmosphere of warmth, trust and affection came about through music. Moreover, emotions and attitudes emerged in the participating group of elderly people, such as happiness, joy, positivity, satisfaction, and enjoyment. Feelings capable of combating negative emotions such as depression, anxiety, social exclusion, loneliness, and isolation. "Music brightens our days, it's good for the heart and soul" (278:5, in M99, 18-19), "having young people around makes us happy" (273:6, in M94, 18-19), "listening to music gives me life, it encourages me" (275:2, in M96, 19-20). The children could see it too: "they had as much fun singing with us as we did with them" (250:4, in A72, 19-20), "all the old people treated us like our own grandparents do, and we

[4]17 refers to the document number; 5 to the number of the citation in the document; in U4 to university student number 4; 18-19 academic year.

love them too" (275:5, in A77, 19-20), "what I liked most about the whole thing was the songs they sang to us, but, above all, how happy they were to have us close." (240:3, in A62, 19-20), "the old people enjoy it because we help them so that they aren't alone and don't feel lonely" (245:5, in A67, 19-20), because "loneliness is very sad" (250: 3, in A72, 19-20), "when you give them a smile and talk to them, you have fun, they have fun and we have fun together" (252:1, in A74, 19-20). This was also perceived by the university students and the teaching staff-researchers: "seeing how the elderly are really entertained, socializing and enjoying themselves is as positive for them as it is for us" (46:3, in U11, 18-19).

On a social level, the socio-community integration of the elderly has benefited from the development of cooperative musical activities that required respect, listening and help from all participants (2:7, in P2, 19-20). Shared spaces were created able to promote interpersonal relationships between the elderly themselves: "today I spoke with one resident of the home for the first time thanks to the young woman (student)" (268:3, in M89, 18 -19), the same occurred between the pensioners and the university students, the primary schoolers, and even the teachers-researchers.

> With the musical instrument-making activity, I consider that, along with the development of fine motor skills, the level of attention and the development of creativity, the fact of doing it in pairs, each pensioner with a child, caused interpersonal relationships to be established. in a pleasant and trusting environment. This generated in everyone a feeling of belonging to the group, since everyone participated, taking part to the best of their ability, and improving the self-esteem of the dependent elderly people (199:5, in U49, 19-20).

3.2. Musical mediation as an element of social and civic education

Music can also be a tool of great value in developing the social and civic citizenship of the elderly, university students and primary education students. All the musical sessions were designed to enhance the development of social responsibility in university students, as well as in the young children, with the aim of contributing to the improvement of the quality of life of the elderly through the commitment of time, dedication, and effort (4:7, in P1, 19-20). "I really like these young people coming here because they listen to me carefully when I tell them about my life, when I tell them what life was like when I was young like them (…). I feel loved." (270:3, in M91, 18-19). "Now I understand better the lives of our pensioners, we have to care for them, respect them and give them loads of love" (238:3, in A60, 19-20). The project has fostered the development of values such as respect, empathy, listening, social recognition, dignity, patience, and social inclusion. Fundamental values, all of them, for the creation of social and ethical citizenship. This being something essential for a future teacher, as a trainer of citizens, even above academic training. "Music has made it easier for me to acquire values that every teacher should have, such as respect, empathy, listening, and social inclusion, principles that are a far higher priority than the contents of the curriculum" (96:4, in U23, 18-19).

> We've been able to acquire certain values we had forgotten and improve our social and civic commitment, by getting to know the old people and treating them with respect and affection; since they are at an age where loneliness prevails and they need to be listened to and cared for, to exchange experiences, stories, and songs among the entire group... Once again, they have shown me that they are role models. I hope the children left with the same feeling (76:4, in U18,18-19).

> Together we've built a wonderful group because we all got along so well. They've made us see things that we didn't know through their stories, and we've shared experiences from the old days and now. I'd have liked to

> spend more time with them, to know how I'll feel when I'm like them. This is how we should all work together, helping older people, because that way, we'll get that help tomorrow too (256:5, in A78, 19-20).

Music has been an element of mediation of important values in the participants: "It's helped me to overcome my fears and realize that I'm truly capable of overcoming anything when I set my mind to it" (95:7, in U23, 18-19). Particularly, collective musical participation has been key in the shaping of an "inclusive citizenship", given that it has fostered the generation of fundamental life skills for 21st century teachers: "music is present throughout our lives, it accompanies us from beginning to end and provides everybody with fundamental values, learning, and strategies for comprehensive development, not just educational" (99:6, in U24, 18-19). "Music gives us sensitivity and enrichment as social beings, and as active and committed citizens" (123:6, in U30, 19-20). "Today we have seen clear gestures of empathy and acceptance with the elderly, showing them understanding, affection and active listening, essential skills as future teachers and as socially committed citizens" (7:4, in P2, 19-20).

> We must learn to build a better society. Between young people, adults... It doesn't matter how old we are, but we all need to help each other and collaborate to become a "big family." We need to be supportive, respectful, and kind, especially, with the elderly" (255:3, in A77, 19-20). Singing together with them makes us feel that we all have something in common (237:4, in A59, 19-20).

3.3. Music as a point of encounter between generations

The intergenerational encounter has been a space for learning, development, and well-being for all those involved, the elderly, the primary schoolers, and the future teachers. In the case of the children, they have changed their minds about what the elderly "are good for": "At first I thought it'd be boring, that the old people wouldn't know how to do anything, but in the end, they did everything, we even had fun together" (257:3, in A79, 19-20). It worked both ways around: "The elderly people were surprised at the things that we [the children] knew how to do and what we didn't (…)" (241:1, in A63, 19-20).

> This experience has enriched me personally, the pensioners are very wise, they've been around for a long time and the experience of being at their side is very enriching. You can learn a lot of things by listening to them. What's more, they're eager for us to pay them attention. They're often very lonely, and loneliness is a very sad thing. (…) We'll all be old one day. We mustn't forget that (256:3, in A78, 19-20).

Furthermore, primary students are advocates for a more inclusive society: "We must create a more supportive society, where we all have the hope of putting smiles on other people's faces" (251:5, in A73, 19-20). This is because the elderly are the ones who built the society we live in, and any progress made is down to their effort and commitment. The university students recognize that: "working with the elderly and the kids is something that has given us much more than we could ever have imagined, as people and as teachers" (97:3, in U24, 18-19). The coming together of several generations under the mediation of music made it possible to create a space of equality among the diversity of interests and needs, combating existing social prejudices: "Thanks to this subject, there have been greater feelings of affection and admiration towards the group of elderly people" (28:2, in U6, 18-19), because they are "capable of doing great things if they are motivated and given the necessary help and opportunities" (196:4, in U48, 19-20).

> At the end of the session, the teacher of the 6th grade students told me that one of the children who had participated the most, singing and cooperating with the old people, had serious behavioural problems at school. This has made me reflect and take on some important ideas for my personal and professional life. Firstly, the activities that involve our innermost human part (such as music) are the ones that invite us to bring out the best

> in ourselves. Secondly, a student who presents disruptive behaviour should never be considered a "lost cause", a path must always be found for and with him/her, and this is one of the key responsibilities of a "good teacher" (12:2, in U30, 19-20).

The elderly also sees intergenerational encounters as spaces for learning, development, and socio-emotional well-being: "it's very nice to talk to children because I can tell them about my life, and they can tell me about theirs, and… we learn from each other" (272:2, in M93, 18-19). "I've been dreaming of Mondays these last months' so I can see these youngsters who bring so much joy to my life, which is always the same, and I've learned lots of new things" (281:4, in M102, 19-20). "When young people and little children come, they make me very happy because I feel that they're already like family" (274:5, in M95, 19-20). "I love young people coming here. I think it's like having my grandchildren closer, I rarely get a chance to see them" (272:3, in M93, 18-19). For this reason, at the end of the experience they always invite both the university students and the primary students to come back and not to forget them: "come visit us whenever you want, we loved meeting you... Remember us" (264:2, in M85, 19-20).

Music has been presented as a vehicle of connection and communication between the three generations participating in the project, because it facilitates the expression of feelings and emotions, creating a climate of affection, respect and listening to the elderly. It has also become a way to evoke the past: "I've enjoyed music since I was a child (…). Now that I'm older, I've been able to remember and reconnect with my childhood, with my youth, with my loved ones, who I remember so well and I miss so much" (273:4, in M94, 19-20). Moreover, through collective musical participation, the socio-emotional well-being of the group of pensioners has been improved: "We've really enjoyed all the things we've done, especially the songs that we all sang. I loved it!" (255:6, in A77, 19-20).

> I knew the power of music to ease pain, anxiety or stress, depression, or isolation; to improve motor skills, respiratory capacity, and short- or long-term memory. But over these weeks, I've been able to experience and understand even more the value of music as a fundamental tool for social inclusion, above all, with this generational exchange by carrying out activities where music is present with people of different ages (80:3, in U19, 18-19).

> What I'm taking away from this is seeing that music is the best vehicle for connecting with people, the best way to generate environments of calm and harmony. As I've said before, music is magic and every day I use it I learn a new trick. What personally caught my attention was that songs from childhood are the ones that old people remember best, instead of the *pasodobles*, couplets or songs that they learned in their youth. Therefore, music contributed to the development of memory and feelings that were dormant (147:4, in U36, 19-20).

4. Discussion

The WHO recognized in 2002 the need for older people in a situation of dependency or who could not take care of themselves to have the most favourable quality of life possible. Making music in an active and creative group form fulfils that objective. It serves both to improve the cognitive, psychological, and social state generated by collective and emotional music and it generates positive emotions and benefits physical and mental health, as music is a recognized and valued art form (Creech, *et al*., 2013a).

Participation in musical activities has a positive impact on the brain functions of older people (Merrett, *et al*., 2013). Costa and Ockelford's studies (2018) reveal that listening to or making music stimulates attention and imagination. If motivated, participants can maintain cognitive function and even learn new skills (Boulton-Lewis, *et al*., 2006). The elderly

participants in the project under consideration acknowledge having acquired several musical skills (singing, listening, instrumental practice, rhythm, movement...) and non-musical learning (improved self-esteem, cooperative work...), overcoming initial stereotyped approaches about their own abilities.

Creech *et al*. (2013a) and Perkins and Williamon (2014) find that collective singing can improve memory, concentration, communication, attention, etc. It can bring out memories and links of identity with one's personal biography. For example, listening to certain melodies evoked personal memories in the elderly participants in the project. Similarly, music can have a positive impact on linguistic skills (Hallam, 2017), being a complement and not a substitute for language (Cross, 2009). The singing of traditional folk songs particularly, tunes such as *La Chica Segoviana* or *La Tarara*, fostered the linguistic competence of the elderly by working on articulation, breathing, verbal fluency, verbal comprehension, and expression, as well as vocabulary. Furthermore, the physical benefits that music can provide for this group are related to improvements in corporal, endocrinal and immunological condition (Fancourt, *et al.*, 2014; Kang, *et al*., 2018; Livesey, *et al*., 2012).

Musical activity can contribute to enhancing the hedonic and eudemonic aspects of older people's well-being (Giraldez-Hayes, 2022; Hallam, & Creech, 2016; Perkins, *et al*., 2020). Group singing raises levels of happiness, enjoyment, and self-esteem (Creech, *et al*., 2013b; Daykin, *et al*., 2018). At the same time, and regardless of musical abilities and background, it minimizes negative emotions, such as loneliness, depression, anxiety or the feeling of isolation or social exclusion (Costa, & Ockelford, 2018; Escuder-Mollón, 2012; Skingley, & Bungay, 2010), encouraging feelings of positive affection and meaning in life. The results of the project reveal that both the elderly and the university and primary school students experienced a climate of affection and trust where joy and shared pleasure prevailed. Examples of this are found in the performance of musical activities such as musical bingo, singing melodies that all the participants knew such as *La, la, la* or *Yo soy aquel*, something that contributes to slowing the aging process (Hays, & Minichiello, 2005). Thus, ongoing education, mediated by music, can be an effective resource for older people to acquire personal confidence that promotes active, productive, and independent aging (Meeks, & Murrell, 2001; King, *et al*., 2016*)*. Music has also served to improve their socio-community integration, strengthening interpersonal relationships between them thanks to the development of group activities that required the use of communicative competence, as is the case of the instrument (cotidiáfonos) construction workshop, musical theatre with black light, etc.

The musical activities of the project analysed were presented following Elliot's (2013) terms of "social practices", serving as a vehicle for the shaping of artistic citizenship. Empathic feelings arose among the participants as a result of musical interaction during the activities, especially those that required imitation, synchronization and shared affective experiences (Laird, 2015), such as the game "Orchestra Conductor" or "The mirror image", recognition, and evocation of traditional songs and dances, among others. Tolerance and respect were also manifested during the intergenerational musical activities, such as working with popular music that allowed the understanding and acceptance of one's own and other people's values (Muldma, & Kiilu, 2012), as well as an understanding of the differences between the generational groups present (Nethsinghe, 2012). It also meant the university and primary school groups, with the help of the elderly, reconnecting with their common sociocultural heritage, something that coincides

with the research of Dobrota (2014). From cooperative and/or collaborative musical activities, the social skills of the three groups were identified (Di Natale, & Russell, 2015) and, deriving from empathetic understanding between them, greater active listening came about (Rogers, & Farson, 2021), as for example in the active musical listening of the "Radetzky March", in the terms of Wuytack and Boal-Palheiros (2009).

According to Darrow *et al*. (2001), projects such as the one analysed in this paper contribute to overcoming the gap between generations, combating isolation and the disconnection between them. Through music, interpersonal ties and mutual care can be created and, thereby, prejudices about different age groups can be combatted (Kaplan, *et al*., 1998). The attitudes of the primary schoolers towards the elderly and vice versa improved after participating in the project, as we could see in the final musical theatre performance where all the groups involved participated collaboratively in a "family" environment of affection, respect, and trust. Something endorsed in the work of Belgrave (2011) and in the *Art for Ages (A4A)* project, which consists of exploring the experiences and mutual benefits perceived by pensioners residing in old people's homes and by music students, in terms of improved positive emotions, interpersonal relationships and, for the latter, professional development (Paolantonio, *et al.,* 2020, 2023). It is precisely participation in this type of projects which enables future teachers to transform learning (Perkins, *et al*., 2015), learning based on observation, imitation, and modelling, which changes attitudes and encourages solidarity and dialogue between generations (Corrigan, *et al*., 2013; Moinolmolki, & Broughton, 2020).

5. Conclusions

This study, of an exploratory, descriptive, and interpretive nature, has analysed the design and implementation of an intergenerational musical education project involving a group of dependent elderly citizens, a group of future teachers of Musical Education and a group of 6th grade primary school pupils. For the first group, it has been an experience that has helped them maintain their cognitive and motor abilities, while improving their socio-emotional well-being. For the second group, it has meant a practical development of their professional skills, by programming, managing, and assessing musical sessions for two groups of people with diverse interests and needs, while they have worked on a deontological level on values such as empathy, respect, solidarity, commitment, and social recognition for the elderly. And for the third group, in addition to the ethical and civic values previously mentioned, the experience of intergenerational encounters made it possible to overcome stereotypical visions about the elderly, in addition to providing added motivation at school.

Nevertheless, it is necessary to acknowledge some of the limitations of this research. The results of the pensioners' participation in the activities of vocal creation, rhythm and dance were not as expected, compared to the other musical and collective activities. On the organizational level, the project timetable was largely adapted to suit the availability of the university students and primary school pupils. Another notable aspect is that the participation of these latter two groups in the project was academically conditioned, given that it was the central element of the subjects they were studying, while the pensioners attended the sessions without pressure of any kind. This fact meant that the attendees among the elderly were those who showed a prior predisposition towards music and were in better physical and cognitive condition. Also worthy of

mention is the potential bias of the teaching-research team that, on the one hand, advised the project on a musical and pedagogical level and, on the other hand, applied the instruments of data collection and analysis. An attempt has been made to minimize this bias through the triangulation of several sources, techniques, and opinions.

The findings presented in this work, though done in a reflective and comprehensive manner, must be read with caution whilst bearing in mind the context in which they were obtained, as well as the limitations mentioned above. Looking to the future, we consider it of interest to take a deeper scientific look into this project, incorporating methodological designs of a positivist nature, providing a mixed character of research (Greene, 2007). The aim would be to carry out a psychometric measurement of the impact of musical activities on the abilities and well-being of elderly people, and on the ethical and civic learning of primary and university students, employing validated instruments. Similarly, it would be ideal to expand the project both in number of sessions and to other areas such as rural zones, in addition to the participation of other groups such as elderly people with senile dementia, students of other ages and conservatory students.

As a final coda, we agree with Susan Hallam and Andrea Creech (2016), noting that while music is not the only social activity that has a positive impact on the health and well-being of older people, it appears to have a greater impact than other group activities. Moreover, music opens a new horizon for the construction of a more socially just and inclusive citizenship, especially with the most vulnerable groups, such as the elderly.

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MONOGRAPH

Listening to Students through their Musical Preferences: Dialogical Gatherings, an Opportunity for Critical Music Education

Escuchando al estudiantado a través de sus preferencias musicales: Tertulias dialógicas, una oportunidad para una educación musical crítica

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Abstract

This paper investigates the impact of the introduction in Primary and Secondary Education of a musical repertoire based on the musical preferences of the students. Starting from a socio-critical position and through an interpretative methodological process by means of a multi-case study, the aim is to analyse how the implementation of dialogical music gatherings affects classroom dynamics and whether this didactic strategy can facilitate a change towards a critical music education. Six cases are studied in six schools, both primary and secondary. The information was obtained from focus groups with students and researchers, research diaries, playlists and conversations held on a social network. After analysing the data, the focus is on a) what the students listen to and how this shapes their identity; b) the topics discussed after listening; c) the educational changes after the implementation of the *tertulias* and their strengths; and d) the difficulties encountered. This study is in line with some of the findings of previous research and can help teachers and researchers to open up more democratic, open, committed, reflective and critical educational-musical scenarios.

Key words: Music Appreciation; Teacher Collaboration; Qualitative Research; Focus Groups.

Resumen

Este trabajo investiga el impacto que tiene la introducción en Educación Primaria y Secundaria de un repertorio musical basado en las preferencias musicales del estudiantado. Partiendo de un posicionamiento sociocrítico y a través de un proceso metodológico interpretativo mediante un estudio multicaso, se busca analizar cómo la implementación de tertulias musicales dialógicas afecta a las dinámicas de aula y si esta estrategia didáctica puede facilitar un cambio hacia una educación musical crítica. Se estudian seis casos en seis centros educativos, tanto de Primaria como de Secundaria. La información se obtuvo a partir de grupos focales con alumnado y con investigadores, diarios docentes de investigación, *playlists* y las conversaciones mantenidas en una red social de intercambio. Tras analizar los datos se incide en: a) qué escucha el estudiantado y cómo esto conforma su identidad; b) las temáticas discutidas tras la escucha; c) los cambios educativos tras la implementación de las tertulias y sus fortalezas; y d) las dificultades encontradas. Esta investigación se muestra en línea con algunos hallazgos de otras investigaciones previas, y puede facilitar a docentes y personal investigador la apertura a escenarios educativo-musicales más democráticos, abiertos, comprometidos y de naturaleza reflexiva y crítica.

Palabras claves: apreciación musical; colaboración docente; investigación cualitativa; grupos focales.

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1. Introduction

Music, understood as art or as a cultural phenomenon, should not be considered neutral or innocent. Cultural, political, and economic interests are woven into its fabric, conditioning the way in which it is produced, distributed, and consumed. Given its impact on human cognitive, emotional, and social spheres, it is crucial to consider music as a prominent educational tool. Its importance transcends mere aesthetics, as it serves as a vehicle for the transmission of knowledge, ideological currents, and an intrinsic language. In this context, it addresses a variety of issues ranging from musical significance, ideology, identity, and gender in relation to music education, to changes and challenges in music curricula and pedagogy (Green, 2014), especially regarding the integration of informal learning in formal music education settings. This enriches learning experiences, promoting creativity, reflective thinking and collaboration, fundamental elements in all kinds of pedagogies committed to change. These emphasise the need to overcome hierarchical teaching practices and encourage openness to collaborative learning opportunities (Goodrich, & Vu, 2023).

In the 21st century, many scholars are striving to reconfigure music education in pursuit of social justice. Critical pedagogy is leading this process of transformation (Hess, 2017). Reflection on musical experience as a form of educational mediation urges us to analyse the curriculum from a critical perspective. This music education seeks to redefine itself through a broadening of the repertoire that questions the very conception of music and historically standardised concepts, and all of this based on the introduction of democratic practices that promote diversity, participation and critical thinking between music and society. For this reason, current music education, which is trying to shed its past constraints by rethinking itself through new lenses (Grissom-Broughton, 2020), can embrace the diversity, also sonorous, of the students. And the school, as a reflection of society, must overcome the disconnection with the social environment and play a crucial role in the formation of its identity, which is constantly evolving and influenced by diverse references in different fields, preferences, and lifestyles (Folkestad, 2006). From a critical perspective, music education should be understood as a dialogue within the classroom that allows a space for horizontal communication, not only through verbal but also musical language, integrating different musical styles and genres. Based on these logics, music education becomes empowering, transformative, and political (Abrahams, 2015; Steinberg, & Kincheloe, 2010).

Music constructs identities through its narrative and communication. It facilitates the exploration and development of identity in relation to aspects such as social class, politics, religion, ethnicity, and gender (Lamb, 2003). Hargreaves and Marshall (2003) point to the evolution of musical identities at different stages. In childhood, the personal dimension linked to adults of reference prevails. In adolescence, the social component, influenced by peers and information technologies, becomes more important. Consequently, musical identity is understood as a dynamic, complex, and fluid process (North, *et al.,* 2000). It is an intersectional and performative construct that is formed in the tensions between the individual and society, playing a crucial role in young people's psychosocial development and sense of belonging. Its educational relevance, for example in facilitating social integration practices (Crawford, 2020), leads us to examine and rethink enculturation processes and musical preferences during the school stage.

In today's digital age, an amplification of musical interaction has been observed that amalgamates local experiences with a global context, thus leading to an acceleration, sometimes

uncritical, of educational and consumption procedures. This phenomenon has also given rise to critical reactions and expressions of resistance in favour of a more leisurely music education (Varkoy, & Rinholm, 2020). These developments have created a new context for the formation of musical preferences, where trends in the adolescent world tend to follow the patterns of global capitalism or the dynamics of music as a fast-moving consumer product. Faure *et al*. (2020) highlight a mutual influence between consumers and the music industry, creating a self-feeding cycle. The industry shapes sound trends that impact on the identity of youth. Given the implications of music preferences on identity, music education should be critical and responsive to students' sound experiences, encouraging diversity, participation, and critical thinking (Abrahams, 2007).

Numerous studies legitimise the use of this type of repertoire as enriching the democratic, ethical, and inclusive nature of educational processes, as well as its contribution to the development of critical thinking, personal growth, collaborative work skills, motivation, and participation (Cheng, 2020; Rauduvaitė, 2013; Tobias, 2015; Väkevä, 2006). Their use also encourages reflection, discussion and expansion of their tastes and identity (Byo, 2018), promoting meaningful and holistic learning (Gage *et al.,* 2020). However, some research points to challenges, such as changing tastes (Miksza, 2013), rejection of lyrics (Parkinson, 2017), translation of excessive traditional male stereotypes in some musical genres (Díez-Gutiérrez, *et al.*, 2023) and difficulties in applying pedagogical methods to this repertoire (García-Peinazo, 2017). Integrating these preferences requires adapting teaching to avoid contradictions. It is recommended to develop programmes and curricula that train music teachers to use this repertoire from a perspective of democratic participation and recognition of student identities.

This study focuses on investigating the impact of the introduction of a repertoire based on students' musical preferences on educational processes. It seeks to analyse in detail the educational implications of the implementation of dialogical music gatherings (TMD) originating from the choices they make. To guide this research, the following research questions have been formulated and have served as a guideline throughout the process:

1. What do students listen to and how do they appropriate this music?
2. What are the predominant themes of the discussions?
3. What are the educational consequences that emerge from the implementation of these *tertulias*? What strengths are identified?
4. What obstacles are encountered during the implementation of the discussion sessions?

2. Method

In this research we have opted for an eminently qualitative methodology that has allowed us to understand the development of the pedagogical action studied in each of the contexts in which it has been implemented. Each of these contexts constitutes a specific case that offers answers to the research questions from its uniqueness and singularity. Also, in this study we were interested in carrying out a transversal analysis in order to put these answers into dialogue and identify shared elements, which is why we opted for a collective or multi-case study approach (Stake, 1998). But what is really distinctive about this design is that it is a collaborative research conducted in conjunction with the school (Cloonan, 2019). Teachers not only implement the

pedagogical action under study, but also collaborate in the research design together with external researchers.

2.1. Context and participants

The choice of the context and participants was determined organically, arising from the needs, commitments and objectives shared by the group of Primary and Secondary Education teachers of the Pedagogical Laboratory PedaLAB-UGR (https://sites.google.com/go.ugr.es/pedalab-ugr). Collectively, the group of teachers, in collaboration with the research staff from the university, decided to initiate research on their own practices in primary and secondary classrooms.

The research was carried out in six public schools in Andalusia (Spain) located in rural or semi-urban areas. In three schools, the research was carried out with students in the third cycle of Primary School and in three others with students in the first, second and third years of Secondary Education (Table 1). All primary classes have a proportion of students in the range of 20-25 per class, while in secondary classes the figure ranges between 24 and 28 students. No data concerning the gender of the students have been included in the table, since in all cases a practically homogeneous distribution was observed, with a margin of variation of only 3%. Regarding the extracurricular musical education of the students, information was obtained secondarily through the reports provided by the teachers in their diaries. It could be observed that, in semi-urban environments, which represent the first two cases, 5-8% of the students have musical training outside the school environment, in contrast to the more rural contexts, where this figure is less than 5%. Despite this difference, the only noticeable effects reported by teachers relate to a higher vocabulary specific to purely musical topics among students with extra-curricular musical training. These data have had marginal or no influence on the analyses carried out in the present study and have therefore not been included in the table below.

Table 1. Description of cases in the study

	STAGE	GRADES	INHABITANTS LOCALITY
CASE 1	Secondary	1^{ST} /2^{ND}	More than 10000
CASE 2	Secondary	2^{ND} /3^{RD}	More than 10000
CASE 3	Secondary	2^{ND}	Less than 5000
CASE 4	Primary - Secondary	5^{TH} /6^{TH} - 2^{ND}	Less than 5000
CASE 5	Primary	5^{TH} /6^{TH}	Less than 5000
CASE 6	Primary	5^{TH} /6^{TH}	Less than 5000

In terms of research ethics, the development of the study was communicated to all those involved in the educational community. The management team and families were informed through an informed consent and opt-out document detailing the nature of the research, the participation of the students and the measures of anonymity and confidentiality. Students were informed directly in class after families signed the document. The research team was committed to negotiate the information under study and to provide resulting reports to the participants.

2.2. Instruments and techniques

Different techniques have been used to collect information in line with TMD, the teaching strategy that was the subject of the research.

Each teacher implemented the TMD in three one-hour sessions. In the first, a playlist was created based on the class preferences and the reasons for these choices were discussed. In the second, songs were presented, the three favourites were voted on and the song was chosen democratically by initiating a first listening and discussing the aspects of the lyrics and music that stand out. In the third, the video clip was viewed, and the musical and lyrical themes previously discussed are discussed in depth.

Each session was audio-recorded, this being the strategy that we have identified in the research as "student focus group" and each teacher prepared a research diary to record observations and the most relevant interventions.

Parallel to the classroom discussions, exchange sessions were held between teachers and external researchers, which we call the "research group focus group", which were recorded and provided additional data on the process. In addition, the exchanges were recorded in a Telegram chat, which we call a "social network exchange". Table 2 shows the data collection techniques used in the different phases of the focus group discussions, and Table 3 illustrates the volume of data handled in the study.

Table 2. Techniques for collecting information linked to the teaching of TDM

	ACTIVITIES	DATA COLLECTION TECHNIQUE
TMD1	Making the playlist Talks on election reasons	Group Playlist GF students (TMD1) Teaching research diary Social exchange network
TMD2	Song selection for TMD2 Listening to chosen song and dialogue on music and lyrics	GF students (TMD2) Teaching research diary Social exchange network
TMD3	Watch the video of the song Dialogue on new topics and deepening of those of the previous session	GF students (TMD3) GF research group Teaching research diary Social exchange network

Table 3. Amount of data collection techniques

	AMOUNT	DETAIL
Group music playlist	6	55 songs
Student focus group	18	9 hours of recording, 162 pages of transcription
Research diary	6	90 pages
Focus group research group	1	2 hours of recording, 35 pages of transcription
Social exchange network	1	373 text and audio messages

2.3. Categorisation

The qualitative data analysis was interactive and iterative, inductively, and collectively constructing a system of categories agreed upon by the working group. Each teacher in their role as researcher, prior to the group category analysis session, identified fragments of text in their diaries to which they assigned an emergent coding. This initial categorisation was used in the research group, where a triangulation process was carried out to reach a consensus on the definition of the analytical categories and the text fragments assigned to them. In this way we

carried out a constant comparative process to avoid a mechanical and formulaic categorisation and remained receptive to emerging dynamics and possible modifications in the different data sources. Following Simons (2011), throughout this process an openness to change was kept in mind as the data were examined and understanding of them grew. The interaction between the researchers and the information analysed has been key in this process, which is understood as both art and science (Strauss, & Corbin, 2002, p.14).

NVivo software is used as a support exclusively to provide structure to the information collected and to access the data in a simpler and more effective way.

Table 4. Category system

MUSICAL PREFERENCES	Access devices
	Reasons for the choice
THEMATIC TALKS	Sexuality Gender roles Naturalisation of violence and drugs Political ideology Fictionality Consumption Aesthetic canon
EDUCATIONAL IMPLICATIONS	Apprenticeships
	Guided participation or methodological strategies Participatory ownership Impact in the school context Strengths Weaknesses

3. Results

Based on the system of categories resulting from the manual coding of all the data collected (Table 4), this section provides an orderly response to the different research questions. In order to facilitate understanding and provide a comprehensive analysis, each sub-section presents various categories of analysis and the relationships generated between them in relation to the research questions.

3.1. What do students listen to and how do they appropriate this music?

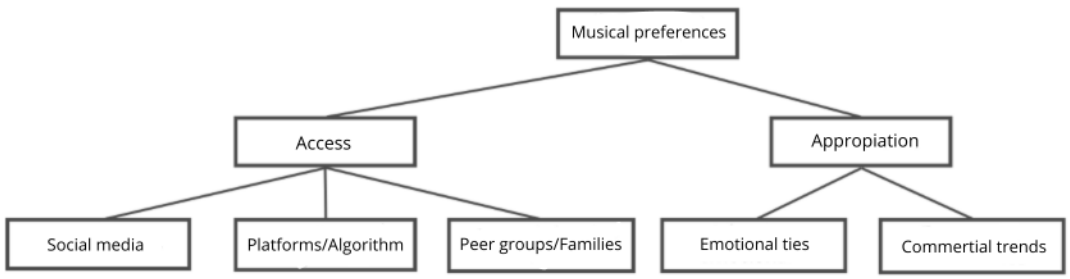

Figure 1. Map of categories of analysis that addresses the first research question

The class playlists reflect the musical diversity present. Although the selection of songs is varied, the most popular music genres among pupils are reggaeton, followed by trap, rap, and

formula radio pop. Most music listening is done via mobile devices, computers, and tablets, with digital platforms being the main sources for discovering and consuming music.

> They pop up on Youtube or Spotify and I leave them. As I don't have premium, I get random songs. Others I know from influencers I follow on Tik Tok (GF TM1. Case 6).

> They tell me that when they search for or play a song, suggestions come up and they discover other songs (Research diary. Case 4).

Some teachers observe changes in how new music is recommended and accessed. In the past, music radio and its critical filters were dominant, but now automated recommendations based on algorithms carry more weight. Still, suggestions from friends and family remain important, and popularity on social media and digital platforms also affects music choice.

> Friends and their recommendations are the main mechanism for music transmission, apart from social networks and platforms such as Tik Tok or Youtube. The radio formula of my generation has passed the baton to algorithms (Research diary. Case 3).

Through social networks such as Tik Tok, viral videos are generated with songs that are known in a fragmented way and that become successful partially and for a limited time.

> When we play a song they have chosen, some people only recognise it when they get to the chorus because they know it from Tik Tok (Research diary. Case 5).

There is a strong emotional attachment to the music, which transcends the musical elements and lyrics, to which they pay little attention. They describe the songs they choose as lively, rhythmic, and associated with moments of joy and fun.

> I asked them if they knew what they were singing and they replied that they didn't care about the meaning, that they liked it because it was catchy and because of the rhythm (Research diary. Case 2).

This disinterest in the meaning of lyrics is more frequent in popular songs that are fashionable at the time. However, some songs are selected because of their provocative language and controversial topics, which are considered taboo at school or in their home environment.

The valuation of musicians focuses less on their musical quality and more on their ability to be popular on social networks. This leads to ephemeral and shifting musical preferences, driven by the speed of the contemporary environment, which is related to the idea of programmed obsolescence in music.

> They comment that the music they chose a couple of weeks ago is no longer their favourite because it is no longer in fashion (Research diary. Case 1).

3.2. What are the predominant themes of the discussions?

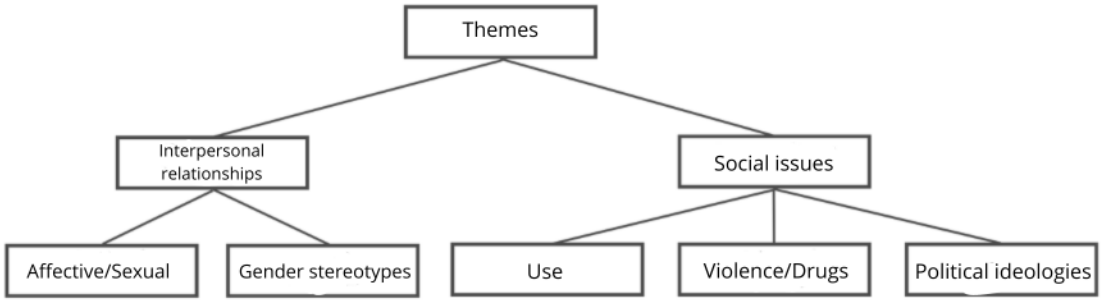

Figure 2. Map of categories of analysis that addresses the second research question

Stereotyping around certain genres of music has been identified, but excluding genres such as pop and rock, even though they could also contain the same themes.

> They are unable to agree on whether it is trap or pop, but they are clear that it is not reggaeton because it does not say "bad" or "sexual" things in the lyrics (Research diary. Case 5).

Attention to extra-musical aspects, such as lyrics and imagery, promotes enriching discussions on issues intrinsically related to identity formation. The representations of gender roles in the songs provide a space to talk about emotional relationships and sexuality.

> These songs can influence how we relate to each other, boys and girls (GF TMD3. Case 3).

> When I have a boyfriend, I stop going out with my friends and I only go out with my boyfriend (GF TMD3. Case 2).

The objectification and submissiveness of women depicted in the songs constitute discussions where pupils show disparate sensitivities about gender roles. Faced with objectification, female pupils are more aware of and uncomfortable with the inert representation of women, while male pupils tend to perceive this role as devoid of any "danger" or negative consequences.

> I am struck by the expression "she is my plant" because it is a way of saying that she is an ornament. I think this song is very sexist and talks about sex with little respect for women. […] But I don't care about the lyrics, I find them funny and I like the music, that's why I'm going to keep listening to it (GF TMD2. Case 6).

In relation to the gender roles represented in the songs and the display of bodies, the presence of a predominant aesthetic canon stands out. Male students tend to identify with a male ideal in terms of attitudes, physical appearance, and style of dress. On the other hand, female students aspire to look like the women portrayed in the video clips. In addition, the aesthetic canon is intrinsically linked to the consumption of a variety of products advertised in the videos.

> I like that song because I like the singer who is "from the street", one who has achieved everything by himself and who has grown up in the street (GF TMD1. Case 2).

> They tell me that it is the latest trend, that everyone listens to it and that what appears in the videos is the clothes that are in the shops (Diary research. Case 4).

There is a process of normalisation of violence and drug use because they are recurrent themes in the songs they listen to, treated in a trivial way and without warning of the risks. The songs provide an opportunity to discuss the "reality" they represent, to reflect on their dangers and to identify what is true and what is fiction.

> One girl says that the videos are not real, that it was probably created by a man and that what comes out of it is false, but it sells. She adds that in real life what appears in the video and what the lyrics say does not happen, because if they said that to her, she would slap him. The other girls support this comment, the boys remain silent (Investigation diary. Case 6).

Some songs are conducive to ideological positioning. In our findings, we have identified a symbolic function in certain songs that are used for the promotion of a specific ideology and for confrontation with those who hold divergent views.

> In my class playlist, the national anthems of Spain and Russia have been playing. I think they use the anthems to confront. They say that one thing is right-wing and another left-wing and I wonder why they are giving them those meanings? When I asked, they said that they were "very polarised since the appearance of the extreme right wing" (GF TMD1. Case 2).

3.3. What are the educational consequences that emerge from the implementation of these *tertulias*? What strengths are identified?

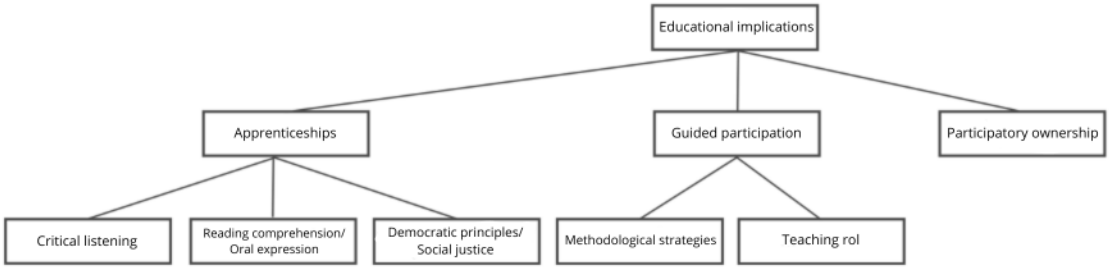

Figure 3. Map of categories of analysis that addresses the third research question

The *tertulias* encourage a form of critical listening that transcends mere sensory or emotional perception. In this sense, pupils now pay more attention to details that previously went unnoticed, thus strengthening the arguments that support their choice of musical preferences.

> They tell me that they had never stopped to listen to a song in this way and that they had learned to pay more attention to the lyrics and the music (Research diary. Case 4).

> Thanks to this activity we have learned to listen differently (GF TMD3. Case 3).

They facilitate the development of skills such as reading comprehension. When analysing the lyrics of songs, pupils sometimes do not know how to identify some metaphors and can misinterpret certain messages.

> When I ask them what the song is about, they tell me that it is about a guy who has been dumped by his girlfriend, which surprises me because, in reality what it explains is that the girl is no longer there because she has died. Their understanding of the lyrics is very limited, they don't understand messages that use metaphors or double meanings (Research diary. Case 2).

In the *tertulias*, there is an emphasis on oral expression which involves skills in communicating ideas clearly. Students learn to structure their thoughts and participate in respectful conversations. During this process, the teaching staff have noticed an increased interest in sharing ideas and an improvement in the observance of rules, thus creating an atmosphere of tolerance and mutual respect.

The choice of songs for TMDs is a challenge due to the variety of titles available on the playlists. Care is taken to ensure that the democratic selection process does not silence minority voices and become a space for exclusion. During the search for consensus, the group makes decisions that lead to reflection on individual preferences and collective identity.

As for the role of the teacher, he/she plays a fundamental role in the dynamics of the discussion group. In this sense, we have summarised the aspects that teachers have highlighted as essential for improving the development of this educational process. Their participation should be on an equal footing with the rest of the group, expressing their opinion at appropriate moments without monopolising the conversation or imposing their perspective. The main role of the teacher is moderation, ensuring compliance with the rules established at the beginning of the discussion. At the same time, it is crucial to pay attention to the ideas that emerge among the students and to raise new questions that allow the same topic to be approached from different perspectives. During the dialogue, you should facilitate the expression of all opinions and act as a defender of democratic principles and social justice in cases where the ideas presented by the students may transgress these limits.

> I tell them that songs like the one they have listened to, which represent the domination of men over women, can lead them to see this way of relating as natural and to see certain macho behaviours as normal. I tell them that at the most dangerous end of this situation is violence against women and that in the same week there have been five murders of women by their partners or ex-partners. I think that introducing this type of commentary is important because it allows them to think about the issue from a different perspective (Research diary. Case 6).

The introduction of TMD has had a positive impact on classroom dynamics. An improvement has been observed in the relationships between students, who show greater respect for individual differences. This positive effect is not limited to relationships between students, but also, and with incidence, extends to the relationship with the teacher.

> Thanks to the implementation of the discussion group activity throughout the year, comments that ridiculed a classmate who liked K-Pop have been eliminated (Research diary. Case 3).

> Not only have I been able to get to know my students better, but I have also established deeper bonds with them as they have opened up and let me see into their souls (Research diary. Case 4).

> Kids stop me in the corridors and say: "teacher, I've heard this song or that one. I'll pass it on to you". It is gratifying to see that they confide in me and share with me things that are important to them (Research diary. Case 3).

> There is interest in the discussions because they are talking about what they know, what they listen to and what they like (Research diary. Case 5).

It is important to note that, although some students were initially reluctant to participate in this activity, teachers subsequently observe that they meet in the courtyard to discuss the topics covered in the discussions. This exemplifies what is known as *participatory ownership*, according to Rogoff's theory (2003), which indicates that learning has been meaningful and has transcended the classroom environment.

> Although in class they tell me that they don't want to talk about these subjects, that they are not interested in making music, that it is a waste of time, then I see them outside talking about what has happened in class, about the subjects we have discussed in the discussion (Research diary. Case 2).

3.4. What are the obstacles encountered during the discussion sessions?

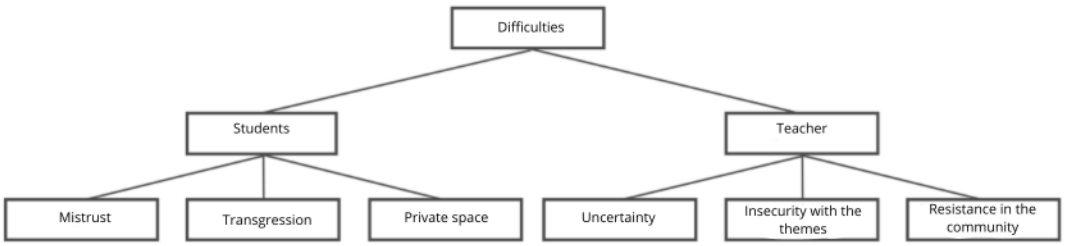

Figure 4. Map of categories of analysis that addresses the fourth research question

The introduction of pupils' preferred music in the classroom is an experience that generates some misgivings among pupils and provokes two types of conflicting reactions. On the one hand, there is a group that is wary of freedom of expression in relation to their musical choices, fearing that teachers may retaliate if they do not consider them appropriate. On the other hand, there is a group that deliberately chooses songs of a provocative nature, taking advantage of the freedom given to them to challenge conventional classroom norms, which is not a common practice in the educational environment.

They also express misgivings that individual musical tastes do not match those of the majority, which has been a challenge and has required different responses depending on the circumstances. Some teachers have implemented private methods of collecting their students' musical preferences, thus providing a confidential space to express their choices without fear of group reaction.

> A Moroccan student was embarrassed to propose her music, I guess for fear of not being accepted. I told her to send it to me privately. The same happened with another student who liked music that was far from the current trends because his tastes came from his father who was a progressive rock fan (Research diary. Case 3).

There are also challenges for teaching as teachers face uncertainty about how students will react, what issues may arise and how best to address them in the classroom.

> We did the audition without watching the video, but I still had a hard time because the song contains pornographic expressions, and I was worried about hurting the sensitivity of the students (Research diary. Case 2).

In addition to the challenges in the classroom, teachers should anticipate possible reactions from families and other school staff. While the need for this activity is recognised in most cases, it may also be perceived as inappropriate due to the use of songs with controversial lyrics and the discussion of topics that some families believe should be discussed privately at home.

> I am writing to inform you that a parent has complained that a song has been played with inappropriate scenes and expressions, requesting that songs be reviewed before they are played. The tutor sent a message to the staff group saying that a mother had complained because a teacher was posting inappropriate content. Worst of all, he knew it was me. He put me down in front of all the classmates without knowing what my pedagogical reasons were (Social network exchange).

TDM requires time for implementation, which is especially challenging in primary classrooms where music is usually only one hour per week. To implement it effectively, it is

necessary to extend it over 3-4 weeks and to maintain continuity of conversations between sessions, even using hours not allocated to music.

> Time is one of the limitations, with the hours of music it is sometimes insufficient, so sometimes I try to get hours if I can with my tutoring (Research diary. Case 4).

Finally, difficulties have been observed in the verbal expression of ideas on the part of students, which led to the consideration of the implementation of other techniques such as musical, plastic, audio-visual or theatrical creation as an alternative for expressing ideas on the topics mentioned above. This would offer them different ways of exercising their freedom of expression and reflection.

4. Discussion and conclusions

This study is in line with previous research indicating that students in the third cycle of Primary School and in Secondary School prefer urban popular music (MPU) (Faure, *et al.,* 2020). Despite easy access to a wide variety of music, thanks to information and communication technologies, there is some diversity in the selected titles but a prevalence of homogeneity in music genres.

Immediate access to music has given rise to a phenomenon of "musical obsolescence", which influences music composition to suit the preferences of youth and benefit the industry. When music becomes a consumer product, the dynamics of production, reproduction, and advertising promotion shape preferences. In addition, algorithms play an important role in generating recommendations based on previous choices, which can limit the exploration of new musical experiences.

In this context of what we can call musical or sound capitalism, the question arises as to whether the preferences that are brought into the classroom are freely chosen and whether the students are really aware of this situation. Here we agree with Montes-Rodríguez *et al*. (2023) that it is the teacher's responsibility to "reveal how these mechanisms work in order to subvert them as far as possible" (p.46) or at least to be aware of this form of invisible manipulation of market structures in order to contribute to true critical listening.

The inclusion of the students' musical preferences in the TMD is what differentiates this study from other similar experiences focused on the canonical repertoire. With this experience, we are moving away from a model of music education that prioritises so-called cultured or classical music and which is often understood as an instrument of exclusion, as it could imply the legitimisation of the cultural power of certain musical manifestations over others.

The practices analysed in the research follow an ecological approach to the curriculum that questions who we are, where we perform and why we perform. We thus address the need for the educational institution to open up to the everyday sound imaginaries of young people and to stop seeing musical experiences inside and outside the educational institution as separate phenomena (Folkestad, 2006). The implementation of TMD allows us to connect with the outside world in which students are forging their civic identity and to create safe environments in the educational institution that allow them to critically analyse their daily lives, fostering processes of emancipation.

To achieve this, moderators must listen to all voices and minimise power relations to build new knowledge that includes all contributions (López de Aguileta, *et al.,* 2020). Thus, the school becomes a shared learning space where different cultures and languages intertwine, transforming the classroom into a place that celebrates diversity and the recognition of everyone (Garcés, 2020) in a 'network of care'.

TMD challenges conventional norms in education by generating disruptive action mediated by music. By transferring power from teachers to students, they can express their opinions and exercise their freedom as citizens, as long as they respect democratic principles and social justice. Moreover, it is a methodology that promotes reflection on their everyday experiences from an ethical perspective and meets the evolving needs of students by enabling them to question surrounding discourses (Tarrant, *et al.,* 2001). Music offers an ethical space for experimentation that is considered safe and socially accepted (MacDonald, & Saarikallio, 2022). In the context of TDM, aspects of this experimentation related to the construction of identity emerge, always within this safe, ethical space where the experiences represented in the songs, which function as an external artefact, are discussed.

We agree with other studies that dialogical conversations about musical preferences allow students to express their values and their influence on their social relationships (Lonsdale, & North, 2017). Music acts as a mediation (Ocaña-Fernández, 2020) that reveals processes of identity construction and inclusion or exclusion in different peer groups. Our research has identified strongly polarised positions among students, especially on issues related to political ideologies, couple relationships and gender roles. Songs often reinforce gender stereotypes and frequently promote patriarchal roles and sexual representations that objectify women and legitimise violent behaviour (Abramo, 2011).

The difficulties that some students encounter in freely expressing their musical preferences in the classroom context can be explained by the close link between certain musical genres and very specific psychological and social characteristics of their listeners (Soares-Quadros, *et al.,* 2023). This attachment through music to a specific peer group that defines their identity means that the choice of favourite music is not trivial and can make it difficult to express true musical preferences in the *playlisting* process. We were able to identify some cases in which adolescents showed different musical tastes in public and in private in order to adapt to the expectations of their peer group.

According to Parkinson (2017), our research also revealed resistance to sharing certain music because it is considered inappropriate in the school environment due to the type of message it conveys. However, we defend the need to address these issues and justify their incorporation as they are aligned with the educational curriculum established in the Spanish context, specifically in the cross-cutting content of all subjects that promote gender equality, peace education, responsible consumption, sustainable development, and affective-social education (article 6, RD 217/2022, 29 March).

The focus of this study is on dialogic learning (López de Aguileta, *et al.,* 2020), which promotes egalitarian dialogue and values arguments according to their validity rather than pre-existing social hierarchies. In this context, diversity is seen as enriching. The classroom reflects the miniature society that is the school, allowing the students' knowledge and experiences to take centre stage. This respects one of the principles of dialogical learning, cultural intelligence. Based on this personal knowledge and experience, the creation of meaning is fostered through

interaction and the demands and needs of the people involved. It is also learning about democratic values and social justice, which foster transformation and emancipation, key elements in a critical pedagogy (Mejía-Delgadillo, 2020).

In the field of music education, we seek to adopt a critical pedagogy that shifts our approach from a primarily practical one to a more reflective and critical one. Through TMD, the doors of the classroom are opened to diverse musical genres previously excluded and the voices of students are prioritised, democratising educational relationships in the classroom (Ocaña, & Reyes, 2011).

In relation to the limitations inherent in this study, it is important to note that these are typical of small-scale qualitative research. This study focused on six specific schools, which implies that the findings cannot be directly extrapolated to a wider population. However, it is relevant to underline that the aim was not to generalise the results, as the main intention was to carry out an in-depth analysis of these contexts and the narratives that emerge in them. This approach is seen as a strength rather than a limitation. However, some biases were detected and recognised by the research and teaching teams, such as, a greater than desirable participation by the teachers in the discussion, who perceived the students' silences as a source of discomfort. Also, insecurity and inexperience in managing the discussion groups could generate various moments in which the students' dispersion was unforeseen, but also typical of this type of qualitative research process.

Furthermore, in the development of this study it was possible to segment the results and organise the findings according to variables such as age, gender, and previous musical training of the students in each case. However, when examining the data collected, it was found that the differences observed were not substantial enough to justify such an analytical structuring. Therefore, a thematic structure focusing on the research questions was chosen to comprehensively understand the participants' experience. Future research could address these issues.

Similarly, it is important to note that long-term monitoring is currently underway to assess the sustained impact of the music *tertulias* in contexts where critical music education pedagogical approaches are being implemented. The project to which this research is linked is still ongoing and, consequently, it will be essential in future research to explore the durability and stability of the changes observed because of the implementation of these practices.

The fact that the teachers are also part of the research team allows us to minimise the subjectivism of the observations, a characteristic feature of social research. The possibility of sharing the analysis carried out with the group and contrasting it with other perspectives allows us to question the initial interpretations that emerge from the observation and analysis of the dialogues in the discussion group. The development of the research from a collaborative perspective force us to question our individual frames of reference in the group in order to build a common frame of reference that guides the analysis of the data and makes us collectively aware of the biases in our own perspective.

This study has allowed us to reflect on power within the music classroom, who makes decisions and how students' interests and experiences are valued. Allowing the inclusion of students' musical preferences is an act of mutual recognition that can be the first step towards a horizontal relationship that supports dialogical learning. The tertulia becomes an essential tool for understanding how music influences the construction of identities in the classroom by connecting

with an ecological approach to learning. By daring to challenge the dynamics that have permeated music pedagogy from a practical approach, we venture to explore new possibilities that bring us closer to a critical, more democratic, engaged, and reflective approach (Hooks, 2022).

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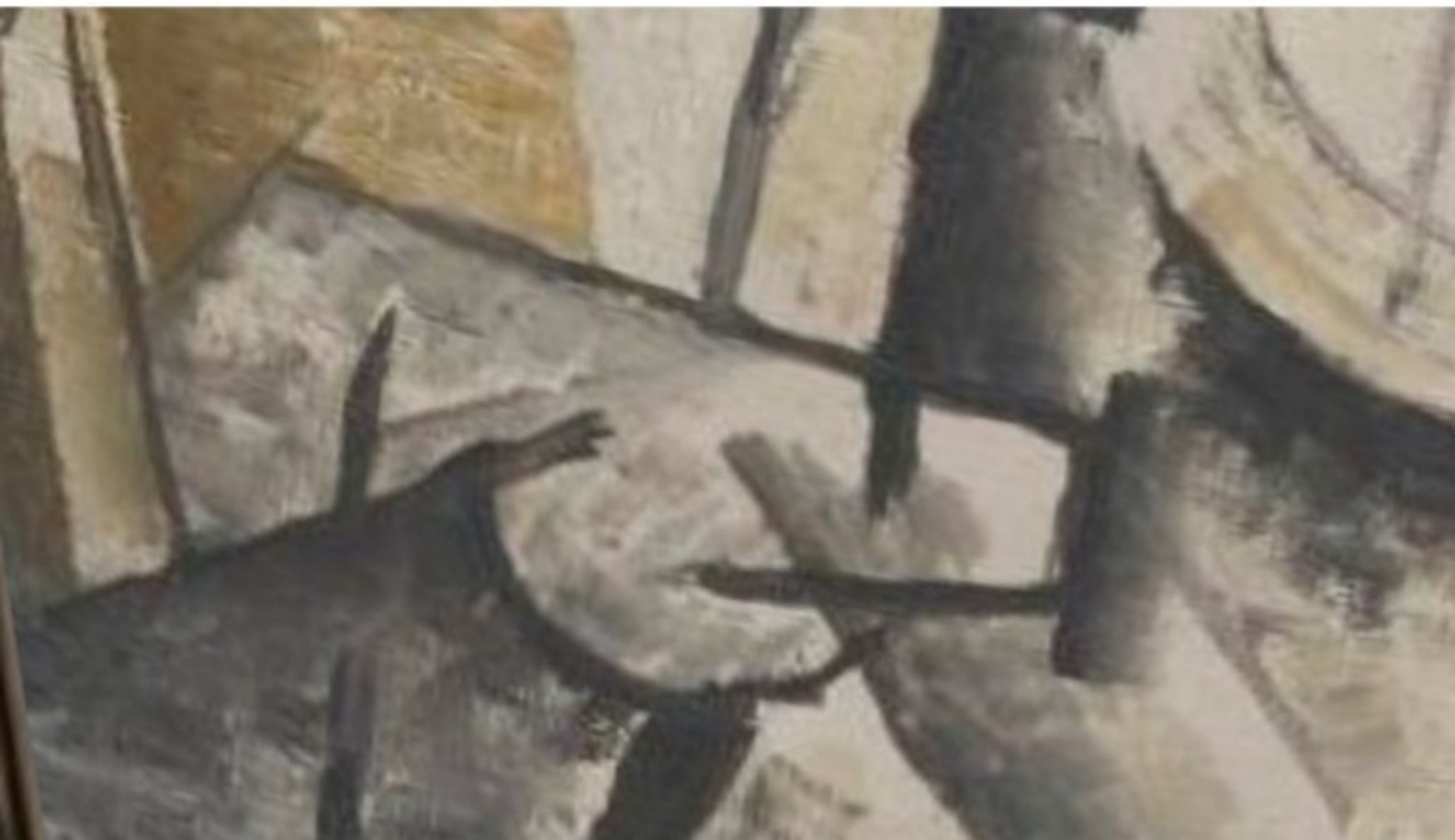

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Mapping Tonal Harmony Pro. A software for harmony learning

Mapping Tonal Harmony Pro. Un *software* para aprendizaje de la armonía

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The present review aims to present the pedagogical capabilities of the "Mapping Tonal Harmony Pro" program in teaching harmony. The program has been developed and updated by the American company *mDecks Music*[2] and there are versions for macOS and iOs [3]. For other operating systems (Windows), an interactive PDF document version is available[4]. The program offers a wide configuration of possibilities through different plugins that allow the approach to harmony from simple chord sequences to the most complex ones. The software allows you to listen to the chords and sequences used at any time. For this review, beyond offering an overview of the program trying to cover the wide range of possibilities it offers, we have chosen to approach the program through the experience in the classes of the subject "Harmony" of the studies of Professional Music Education. The initial configuration chosen is shown in Figure 1.

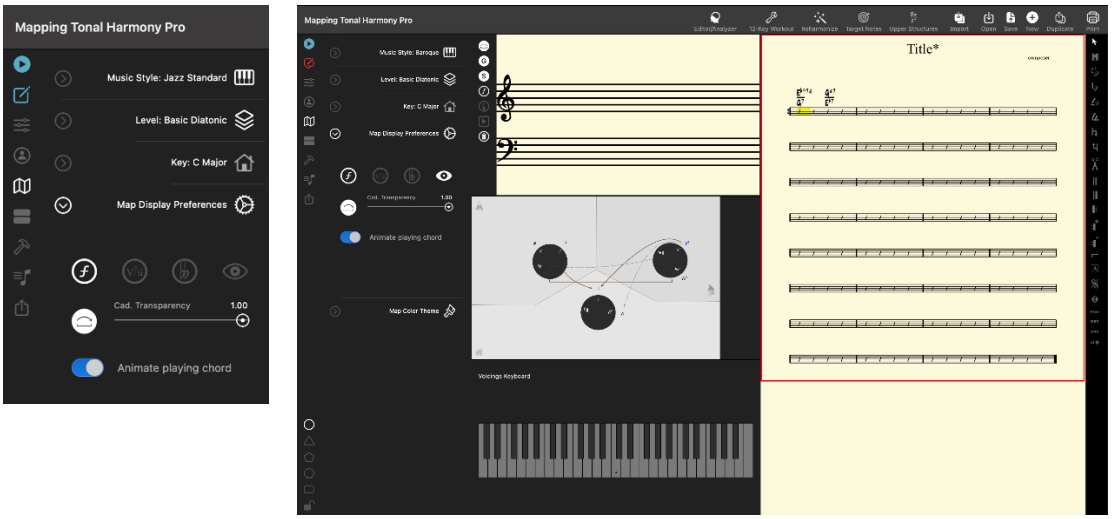

Figure 1. Program interface and configuration window

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[2] https://mdecks.com/index.phtml
[3] https://mdecks.com/mapharmony.phtml
[4] https://mdecks.com/the-composers-guide-to-tonality.phtml

This configuration results in chords harmonically located within the Baroque period, diatonic harmony and key of C M (C Major). Once the configuration has been chosen, the program interface is configured as shown in Figure 1.

In order to learn harmony, one of the first questions is to understand the tonal system and the hierarchical relationships established between the three main tonal functions, i.e. Subdominant, Dominant and Tonic. Once the tonality to be worked on has been established, the program establishes the three tonal regions and places each of the chords of the seven degrees of the scale according to the tonal function that corresponds to them, which allows a quick and clear vision of each of them[5]. In addition, it shows by means of arrows (solid line) the direction of the two concluding cadences:

- Authentic Cadence: from the Dominant region (group of chords located at the top right) to the Tonic region (group of chords located at the bottom center).

- Plagal Cadence: from the Subdominant region (group of chords located at the top left) to the Tonic region (group of chords located at the bottom center).

Also of the broken cadence, by means of a dotted arrow:

- From the region of the Dominant to the VI, located in the area of the Tonic region, or to the ^{b}VI located in the region of the subdominant.

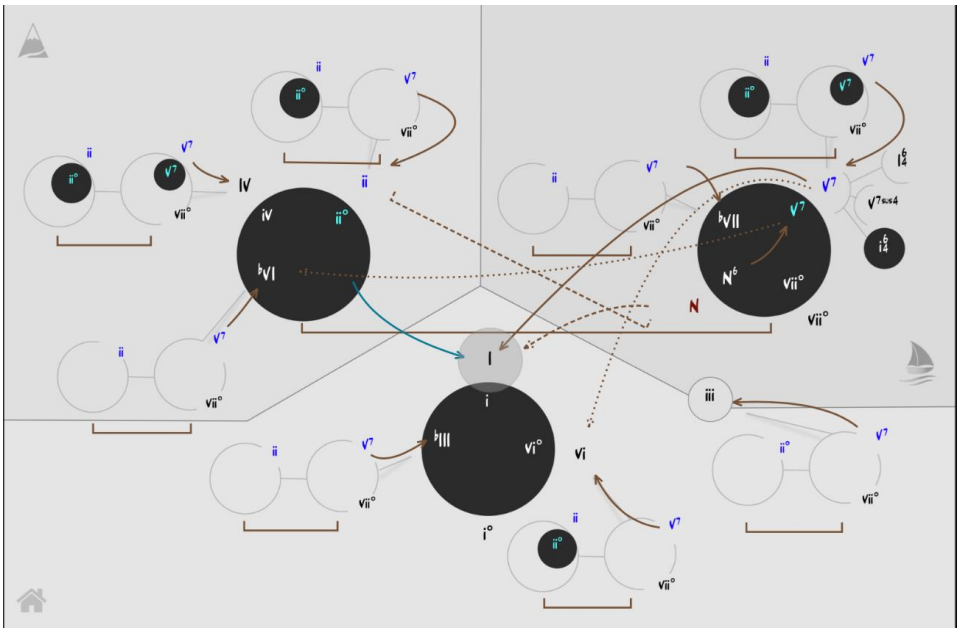

Figure 2. Tonal Regions

Making the tonal regions visual, the distribution of chords between them, as well as being able to choose a succession of chords from the different regions while listening to them, greatly facilitates the understanding of the harmonic tensions and distensions produced by each of the regions and helps to introduce the concept of substitution between the different chords of each region. Subsequent to this approach to the basic concept, with a change in the configuration, the

[5] It is important to clarify that the programme's placement of the III within the Tonic region is very common in jazz, but not so accepted in classical tonal harmony. The III is a degree with a very ambiguous sonority since, although it shares two sounds with the Tonic chord and two with the Dominant chord, it does not offer enough tension to be used as a Dominant, nor does it offer enough of a sense of rest to be used as a Tonic.

program allows the addition of secondary dominants (Figure 3). To do this, the program sets each of the degrees as a Tonic region and assigns it its own Subdominant and Dominant regions, as shown in Figure 4.

The introduction of Secondary Dominants and the concept of "passing tonicization", showing the Subdominant and Dominant regions of each of the different degrees, allows, at the same time, a clear and thorough approach to modulations and the concept of expanded tonality, which is also offered by the program.

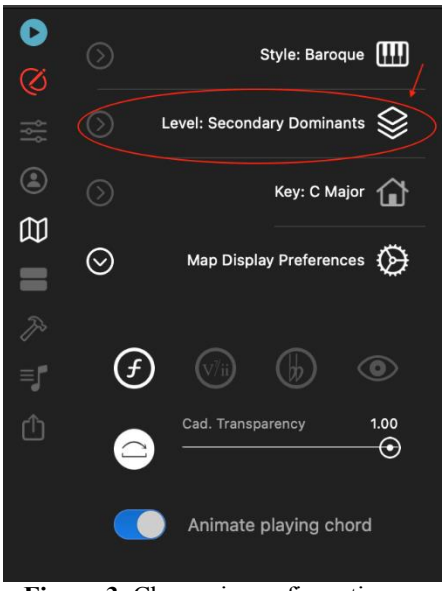

Figure 3. Change in configuration

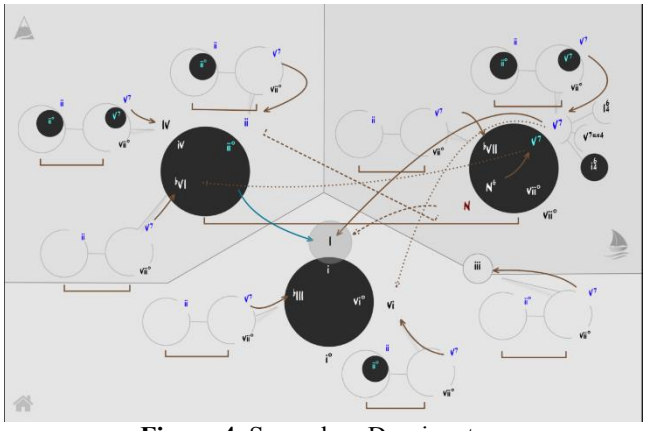

Figure 4. Secondary Dominants

Conclusions

In conclusion, the program *Mapping Tonal Harmony Pro* can be of great help for the teaching of the subject "Harmony" in Professional Education classes. The different configurations of the program allow to sequence the complexity of the contents shown, to see the written chords and to be able to locate them visually on the basis of their tonal function, which is a great help for the theoretical expositions. In addition, the program also allows to listen to each of the chords individually, which helps the students to assimilate aurally the different sonority of the different types of chords. Similarly, the fact of being able to choose, also visually, between different chords within a certain region and establish a succession of chords to create a harmonic sequence, being able to try and listen, greatly facilitates the exposure of the theoretical concepts of tonal harmony and makes these concepts more easily assimilated and understood by the students because it allows them to work with them directly from practice and listening.

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