



Interdisciplinarity between Physical Education and Music Education in primary education through dance

Interdisciplinarietà entre Educaç o F sica e Musical em educaç o prim ria mediante dança

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Abstract

Introduction: Dance offers multiple benefits for primary school students and can serve as a strong link between Physical Education and Music Education. However, there is limited literature analyzing the role of dance in interdisciplinary educational projects.

Objective: The main objective of this study was to understand the perceptions of Physical Education and Music Education teachers regarding interdisciplinarity and the role of dance as a unifying element between these subjects.

Methodology: Following a phenomenological design, semi-structured interviews were conducted with four primary school teachers of Physical Education and Music Education from a subsidized school. The data were analyzed using thematic analysis.

Results: The findings revealed that dance provides numerous benefits for students, including improved coordination, rhythm, movement, and balance. Teachers emphasized the importance of coordination between educators, the availability of adequate spaces, and student motivation for the success of interdisciplinary projects.

Discussion: The results align with previous studies that highlight the potential of dance to enhance student motivation and engagement in both Physical Education and Music Education. The integration of dance in teaching practices facilitates holistic learning experiences that encompass cognitive, physical, and emotional development.

Conclusions: Dance effectively serves as an interdisciplinary link between Physical Education and Music Education, promoting student motivation and teacher collaboration. These findings contribute to the broader discourse on the educational value of dance and its role in fostering interdisciplinary learning.

Keywords

Interdisciplinarity; dance; Physical Education; music education; holistic learning; body expression.

Resumen

Introducci n: La danza presenta m ltiples beneficios para los alumnos de Educaci n Primaria y puede ser un s lido nexo de uni n entre las asignaturas de Educaci n F sica y Educaci n Musical. Sin embargo, existe escasa literatura que analice el papel de la danza en proyectos educativos interdisciplinarios.

Objetivo: Conocer las percepciones de los maestros de Educaci n F sica y Educaci n Musical sobre la interdisciplinari dad y la funci n de la danza como nexo de uni n entre ambas asignaturas.

Metodolog a: Siguiendo un dise o fenomenol gico, se llevaron a cabo entrevistas semiestructuradas con cuatro maestros de Educaci n Primaria de Educaci n F sica y Educaci n Musical de un centro concertado. Los datos se analizaron mediante an lisis tem tico.

Resultados: Los hallazgos revelaron que la danza proporciona numerosos beneficios para los alumnos, incluyendo la mejora de la coordinaci n, el ritmo, el movimiento y el equilibrio. Los maestros enfatizaron la importancia de la coordinaci n entre educadores, la disponibilidad de espacios adecuados y la motivaci n de los alumnos para el  xito de los proyectos interdisciplinarios.

Discusi n: Los resultados se alinean con estudios previos que destacan el potencial de la danza para mejorar la motivaci n y el compromiso de los alumnos tanto en Educaci n F sica como en Educaci n Musical. La integraci n de la danza en las pr cticas docentes facilita experiencias de aprendizaje hol sticas que abarcan el desarrollo cognitivo, f sico y emocional.

Conclusiones: La danza sirve eficazmente como un nexo interdisciplinario entre la Educaci n F sica y la Educaci n Musical, promoviendo la motivaci n del alumnado y la colaboraci n docente. Estos hallazgos contribuyen al discurso m s amplio sobre el valor educativo de la danza y su papel en el fomento del aprendizaje interdisciplinario.

Palabras clave

Interdisciplinari dad; danza; Educaci n F sica; educaci n musical; aprendizaje hol stico; expresi n corporal.

Introduction

The concept of interdisciplinarity first emerged in 1937, introduced by Louis Wirtz, as an alternative to teaching subjects in isolation. Since then, interdisciplinarity has been understood as a method that allows the study of different segments of reality in their complexity from various interrelated points of view, portraying the world as an interconnected whole (Cortés, 2008).

Interdisciplinarity should be viewed as a methodology that promotes a globalized understanding of the world, as it facilitates competency-based teaching and encourages collaborative and contextualized work (Ley Orgánica 3/2020, de 29 de diciembre, que modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación - Organic Law 3/2020, from December 29th, Amending the Organic Law 2/2006, from May 3rd, of Education, 2020; hereinafter, LOMLOE). In contemporary education, there is a growing emphasis on interdisciplinary approaches that foster a more holistic and integrated understanding of knowledge. Rather than presenting subjects in isolated silos, interdisciplinarity encourages students to make connections across different fields, promoting critical thinking and a deeper appreciation of complex concepts. In this sense, an interdisciplinary project requires strong commitment from teaching staff, seeking a globalized learning approach that integrates multiple disciplines (Conde et al., 2010). To achieve a coherent and comprehensive understanding of reality, the effectiveness of interdisciplinarity depends on coordination among different areas and on shared methodological planning (Kibirige, 2023; Moore et al., 2023).

Physical Education (PE), with its inherent focus on the body, movement, and expression, serves as a particularly effective hub for establishing these interdisciplinary links. Recent research has highlighted the diverse potential of PE as a nexus for interdisciplinary learning. Studies show that focusing on physical literacy within PE can promote holistic student development that encompasses not only physical skills but also cognitive, social, and creative domains, leading to greater student satisfaction and learning efficiency (Houser & Kriellaars, 2023). Furthermore, PE provides a practical context for character education, with thematic and content-based methods being used to implicitly and explicitly teach moral content (Brunsdon, 2025a, 2025b). The integration of technology, such as multimedia applications, has also been shown to enhance interdisciplinary learning in PE by providing real-time feedback that improves both psychomotor skills and student engagement (Li & Liu, 2024).

Among the various subjects PE can connect with, the link with Music Education is particularly organic. Both disciplines share fundamental elements such as rhythm, tempo, movement, and body awareness, making them natural partners for collaborative projects. Dance, as an art form, emerges as a unifying link between PE and Music Education, given that it is an artistic and athletic discipline integrating body expression and musicality (Martín Escobar, 2005; Mattsson & Larsson, 2021). Various studies highlight its potential to generate a holistic development in students (González García & Armas Junco, 2024), providing health, behavioral, and inclusion benefits, as well as to develop motor, aesthetic, and communication skills, and to foster students' creativity and motivation, enhancing their overall development (Bremmer, 2023; Engdahl & Ceder, 2023; Martínez Arnosi, 2012). Furthermore, it contributes to the acquisition of basic abilities and skills, as well as to the development of coordination and perceptual-motor abilities (Vicente Nicolás, 2013; Vicente Nicolás et al., 2010). It also enables an education of the body and movement, promoting self-awareness and creativity (Martínez Arnosi, 2012) and educational inclusion (González García & Armas Junco, 2024).

By occupying an intermediate position between Physical Education and Music Education, dance can make a significant contribution to the implementation of interdisciplinary projects, as it encompasses elements from both subjects. According to Ferreira Urzúa (2009), the body-self relationship in dance enables students to discover how they learn and what they learn through movement. This process promotes the creation of knowledge, habits, and attitudes—facilitating adaptation to the environment and adult life—and aligns with curricular proposals aimed at achieving competency-based and deeply experiential learning (Appiah et al., 2023; Ørbæk & Engelsrud, 2021).

Dance offers multiple benefits for Primary Education students and can serve as a strong unifying link between Physical Education and Music Education. However, there is a scarcity of literature examining the role of dance in interdisciplinary educational projects, and teacher training lacks a specific teaching on dance and corporal expression (Troya Montañez & Cuéllar Moreno, 2013). Furthermore, the success-



ful implementation of any interdisciplinary curriculum is not just a matter of design but is deeply influenced by the educators who enact it. The process can present significant challenges, and its success often hinges on teacher beliefs, institutional culture, and prior experience (Aasland et al., 2025). Therefore, understanding the perspectives of teachers is crucial for developing effective interdisciplinary practices. This shortfall underscores the need to delve into both teachers' perceptions and the ways in which dance can be integrated into teaching practice to maximize its pedagogical potential (Cortés, 2008). In line with previous work, it has been observed that music and movement can enhance students' motivation and engagement, provided that there is adequate teacher coordination and flexible planning (Bremmer, 2023; LOMLOE, 2020). Based on the above, the main goal of this study was to explore and understand the perceptions of primary school PE and Music Education teachers regarding the implementation of interdisciplinary projects that use dance as a unifying element. To achieve this objective, our inquiry was guided by one primary research question: How do primary school PE and Music teachers perceive the role of dance as an interdisciplinary bridge between their subjects?

To answer this overarching question, we posed the following secondary questions:

- 1: How do teachers conceptualize and define interdisciplinarity within the context of their teaching practices in PE and Music?
- 2: What do teachers identify as the main pedagogical opportunities, benefits, and objectives of implementing dance-based interdisciplinary projects connecting PE and Music?
- 3: What are the perceived challenges, barriers, and practical considerations that influence the successful implementation of these interdisciplinary projects in a primary school setting?

Method

Participants

Context

The sample was selected at a school located in the city of Seville (Spain). The school offered three parallel class groups from Early Childhood Education through Upper Secondary Education, and there was a positive relationship and collaboration among the various educational stages. The area's socioeconomic level was medium-high, although, in general, the families attending the center had high socioeconomic status. It was a subsidized school that required its teachers to engage in ongoing professional development and strived to remain at the forefront with respect to technology, multiple intelligences, and thinking-based learning. The school's educational offerings were extensive and included, in addition to the class hours established by the current education law, four weekly enrichment sessions in English, chess, sports, and music. Along with these activities, which were offered to all students, there was also a catalog of extracurricular activities such as theater, painting, acrobatic gymnastics, roller hockey, or taekwondo.

Participants and sampling procedure

A purposeful, non-probabilistic sampling method was used, based on the teachers' willingness to participate and their commitment to being interviewed. The goal was to purposefully select individuals that "will best help the researcher understand the problem and the research question" (Creswell & Creswell, 2018, p. 262). A total of four primary school teachers took part in the study, ranging in age from 34 to 50 years old and having between 1 and 20 years of teaching experience. The pseudonyms used to preserve confidentiality in the study are Lidia, Antonia, Isabel, and Jorge. Lidia, Isabel, and Jorge belong to the PE department. Lidia teaches that subject to the first cycle of primary school students, and this is her first year teaching in that area. Isabel teaches the second cycle of primary school and has five years of experience at the school. Jorge has twenty years of experience at the school, teaching both the first cycle of primary school and upper secondary students. Antonia is the Music Education teacher for primary school and has six years of experience at the institution.

This study followed the ethical guidelines set forth in the Declaration of Helsinki regarding participant consent, confidentiality, and anonymity, and it was approved by the University of Seville.



Design

A qualitative research methodology was employed in this study to analyze and understand the meanings that participants assigned to a given problem (Creswell & Creswell, 2018). Within the qualitative methodology, a descriptive phenomenological design was followed, consisting of the description and interpretation of the experiences that participants had undergone with regard to a specific phenomenon (Creswell & Creswell, 2018; Giorgi, 2009; Moustakas, 1994; Patton, 2015).

Procedure

Instrument

A semistructured interview, developed ad hoc, was used to collect the participants' experiences regarding our research questions. This alignment ensures that the methodological approach of this research is coherent and that the evidence collected is directly relevant to the study's aims. This type of interview involved drawing up a script of questions or topics to be addressed during the session, ensuring the continuity of a guiding thread that covered all relevant topics with all participants (Patton, 2015). This format was chosen because it provides a unique combination of structure and flexibility: using a pre-prepared script ensured that key topics directly related to the research questions were covered consistently with all four participants (Creswell & Poth, 2018), while it also allowed the interviewer the freedom to ask probing follow-up questions, explore emergent themes, and invite participants to elaborate on their responses (Patton, 2015). To ensure the protection of interviewees' data, fictitious names were used.

The interview included a total of 22 questions, divided into several sections:

1. Introduction: Questions related to introducing the interviewer and interviewee, an icebreaker question, and an explanation of the study's aim (questions 1-3).
2. Concept of interdisciplinarity: Definition and objectives for an interdisciplinary project (questions 4-5).
3. Physical Education: Interdisciplinary possibilities, impact on students, and challenges (questions 6-8).
4. Music Education: Interdisciplinary possibilities, impact on students, and challenges (questions 9-11).
5. Dance as a unifying element: The importance of dance, its benefits, previous use, and participation in interdisciplinary projects (questions 12-15).
6. Foundations for an interdisciplinary project: Methodological considerations, transversal and functional learning, and student autonomy (questions 16-19).
7. Potential problems: Experience in interdisciplinary projects, issues encountered, and possible future challenges (questions 20-21).
8. Conclusion: Acknowledgments, questions, and data confidentiality (question 22).

The complete script of the interview conducted is shown in Table 1, alongside the relationship between research questions and the specific questions asked during the interview.

Table 1. Relation between research and interview questions

Nº	Interview question	Research question
1	Introduction of the interviewer	-
2	How are you? How has your day been so far?	-
3	Explanation of the study's objective.	-
4	In your opinion, how would you define interdisciplinarity?	1
5	What objectives do you believe could be proposed for interdisciplinary work?	1
6	In your opinion, how could Physical Education be connected to other subjects?	1, 2
7	How do you think combining Physical Education with other subjects could impact students?	2
8	What difficulties do you think could arise when planning an interdisciplinary project in Physical Education? And what problems might your students encounter when participating in one?	3
9	In your opinion, how could Music Education be connected to other subjects?	1, 2
10	What impact on students could result from combining Music Education with other subjects?	2



11	What challenges might arise when designing an interdisciplinary project in Music Education? And what problems could students face when taking part in one?	3
12	What importance do you think dance has as a unifying element between Physical Education and Music Education?	2
13	What benefits do you believe dance can bring to students?	2
14	To what extent have you used dance in your teaching before?	2
15	Have you previously carried out any interdisciplinary project between Physical Education and Music Education? If so, please tell me something about that project.	1, 2
16	What do you think should be considered when creating an interdisciplinary project between Physical Education and Music Education?	2, 3
17	How could you achieve a more transversal form of learning?	2, 3
18	How would you design activities that lead to more functional learning?	2, 3
19	What actions would you take to foster student autonomy?	2, 3
20	If you have previous experience with other interdisciplinary projects, what problems have arisen?	3
21	If you were to develop an interdisciplinary project between Physical Education and Music Education, what issues do you think you might face? And if dance were the main unifying element of this project?	3
22	Thank the participant for their time, respond to any questions, and emphasize confidentiality.	-

Note. Research question 1: How do teachers conceptualize and define interdisciplinarity within the context of their teaching practices in PE and Music? Research question 2: What do teachers identify as the main pedagogical opportunities, benefits, and objectives of implementing dance-based interdisciplinary projects connecting PE and Music? Research question 3: What are the perceived challenges, barriers, and practical considerations that influence the successful implementation of these interdisciplinary projects in a primary school setting?

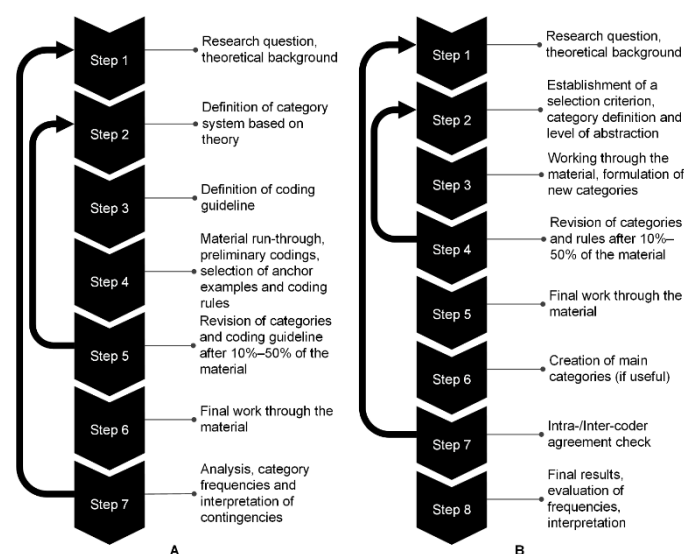
Data collection

The interviews were conducted in April 2023, following the recommendations of previous studies (Creswell & Creswell, 2018; Muñoz-Llerena, 2022; Muñoz-Llerena et al., 2021, 2022). They were recorded using a mobile phone (audio only) and then transcribed verbatim by the second author. Each interview lasted between 20 and 35 minutes in total.

Data analysis

The data gathered from the interviews, following their transcription, were analyzed using qualitative content analysis methodology (Mayring, 2014). Within this methodology, a specific thematic analysis technique, also known as content structuring, was employed. This technique involved two different steps in the analysis process: prior to beginning the analysis, a set of categories was developed, emerging either from existing theory or literature or from the interviews themselves (deductive analysis). These categories were outlined in a coding guide, and the material was then coded accordingly. Once deductively coded, the material was synthesized within each category (inductive analysis). The different steps followed in thematic analysis can be found in Figure 1. Data analysis was carried out using Nvivo 2020 software.

Figure 1. Steps followed in thematic analysis.



Source: self-elaboration based on Mayring (2014). A: Deductive analysis; B: Inductive analysis.

Methodological rigor

To ensure the authenticity and validity of this qualitative study, we adhered to the criteria for trustworthiness established by Lincoln & Guba (1985): credibility, transferability, dependability, and confirmability. Specific strategies were implemented throughout the research process to uphold these standards and address potential threats to the validity of our conclusions.

Credibility, which concerns the truthfulness of the findings, was enhanced through two primary methods. First, we employed analyst triangulation (Creswell & Creswell, 2018), where multiple researchers coded and analyzed the interview data independently before comparing and agreeing upon the final themes. This process minimized individual researcher bias in interpreting the teachers' perceptions. Second, a critical friend (Brewer & Sparkes, 2011), an external peer with expertise in the field of study, reviewed our methods and interpretations, providing objective feedback to challenge our assumptions and refine our analysis.

Transferability, or the applicability of the findings to other contexts, was addressed by providing rich, thick descriptions of the research setting, participants, and methodology. By detailing the context of the subsidized school in Seville and the specific roles of the participating PE and Music Education teachers, we offer readers sufficient information to assess the relevance of these findings to their own educational environments.

Dependability, which refers to the consistency and stability of the research process, was ensured through the same strategy of analyst triangulation. This ensured that the results were not the product of a single researcher's subjective interpretation. Furthermore, we provided comprehensive descriptions of our data collection and analysis procedures, creating a clear audit trail that allows the study's process to be followed and scrutinized.

Confirmability, or the neutrality of the findings, was established by ensuring that the results were grounded in the participants' data rather than the researchers' biases. This was achieved through the combined use of analyst triangulation and our critical friend. To further secure objectivity, all interviews were audio-recorded and transcribed verbatim. The use of direct quotations from the teachers in the results section provides a clear and traceable link between the data collected and the conclusions drawn, allowing the participants' voices to validate the findings.

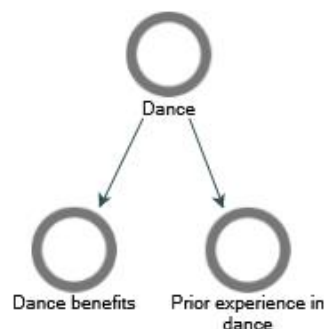
Definitions of dimensions and categories

In the data analysis, results emerged from three different dimensions: Dance, Learning, and Interdisciplinarity.

Dance

This dimension encompassed all aspects related exclusively to dance, giving rise to two main categories: benefits of dance and previous experience (Figure 2).

Figure 2. Categories of Dance dimension.



Source: Self-elaboration

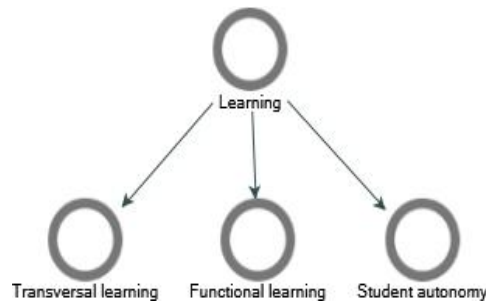
- **Dance benefits:** This category referred to the benefits of dance for students (e.g., improvements in coordination, rhythm, movement, or balance).

- Prior experience in dance: Prior dance experience the interviewees had acquired throughout their teaching careers.

Learning

In this dimension, the specific aspects or actions mentioned in the interview as learning facilitators were presented, divided into the categories of transversal learning, functional learning, and student autonomy (Figure 3).

Figure 3. Categories of Learning dimension.



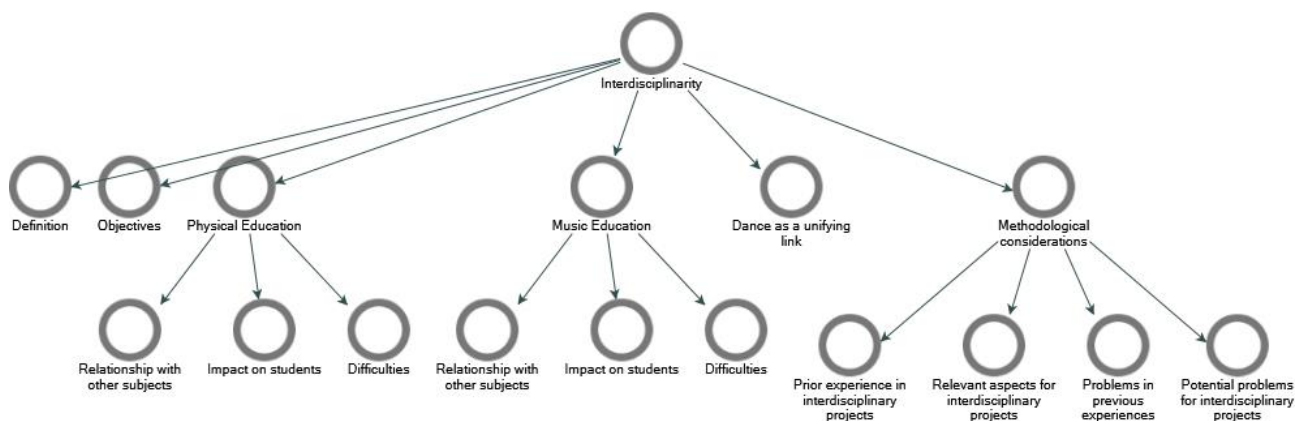
Source: Self-elaboration

- Transversal learning: The way of approaching teaching to enable more transversal student learning.
- Functional learning: The need for functional learning and the type of activities required to achieve it.
- Student autonomy: Actions that could be performed to encourage student autonomy within the framework of an interdisciplinary project.

Interdisciplinarity

In this final dimension, aspects directly related to interdisciplinarity were addressed, both generally and specifically in connection with PE and Music Education. Different categories emerged, some of which were further divided into various subcategories (Figure 4).

Figure 4. Categories of Interdisciplinarity dimension.



Source: Self-elaboration

- Definition: A category aimed at finding a definition for the concept of interdisciplinarity.
- Objectives: Objectives that could be established for interdisciplinary work.

- Physical Education: Interdisciplinary possibilities of PE. Three subcategories emerged within this category:
 - Relationship with other subjects: Various ways of linking PE with other subjects.
 - Impact on students: The effect on students resulting from combining PE with other subjects.
 - Difficulties: Challenges that might arise when proposing an interdisciplinary project in PE.
- Music Education: Interdisciplinary possibilities of Music Education. Three subcategories emerged within this category:
 - Relationship with other subjects: The different possibilities for linking Music Education with other subjects.
 - Impact on students: The effect on students as a result of combining Music Education with other subjects.
 - Difficulties: Challenges that could arise when preparing an interdisciplinary project in Music Education.
- Dance as a unifying link: The potential importance of dance as a unifying link between PE and Music Education.
- Methodological considerations: Methodological aspects that should be taken into account when creating an interdisciplinary project involving PE and Music Education. Four subcategories emerged in this category:
 - Prior experience in interdisciplinary projects: The interviewees' prior experience with interdisciplinary projects over their teaching careers.
 - Relevant aspects for interdisciplinary projects: Elements to consider when implementing an interdisciplinary project.
 - Problems in previous experiences: Issues respondents encountered in their prior experience conducting interdisciplinary projects.
 - Potential problems for interdisciplinary projects: Potential challenges the interviewees believe may arise when undertaking an interdisciplinary project.

Results

Before showing the results of the thematic analysis, and in order to gain a deeper understanding of the underlying pedagogical philosophies shaping the teachers' responses, a secondary level of analysis was conducted. The statements within each main category were classified according to a framework that distinguishes between traditional, practical, and innovative educational perspectives: A traditional perspective is characterized by a subject-centered view, emphasizing established content and conventional teaching methods; a practical perspective is grounded in functionality and feasibility, focusing on the direct application of concepts and the logistical realities of classroom implementation; and an innovative perspective reflects a student-centered, transformative approach, prioritizing concepts like student autonomy, holistic learning, and the integration of new pedagogical models.

This classification allows us to map the core beliefs and attitudes that influence how teachers approach interdisciplinarity. Table 2 presents this analysis, showing how each participant's views align with these three perspectives across the different categories.

Table 2. Categories and personal vision of the participants

Dimension	Category	Traditional vision	Practical vision	Innovative vision
Dance	Dance benefits	Isabel	Lidia Jorge	Lidia Antonia
	Prior experience in dance	Isabel		Lidia



Learning	Transversal learning	Jorge	Isabel Jorge	Antonia Lidia Antonia
	Functional learning		Lidia Isabel	Antonia Jorge
	Student autonomy	Jorge	Isabel	Lidia Antonia
Interdisciplinarity	Definition	Jorge Isabel	Antonia	Lidia
	Objectives	Jorge	Antonia	Lidia Isabel
	PE - Relationship with other subjects	Jorge	Isabel	Lidia
	PE - Impact on students	Isabel	Jorge	Lidia
	PE - Difficulties	Jorge	Lidia Isabel	
	ME - Relationship with other subjects		Antonia	
	ME - Impact on students			Antonia
	ME - Difficulties		Antonia	
	Dance as a unifying link	Lidia Jorge	Antonia Isabel	
	MC - Prior experience		Lidia	Antonia
MC - Relevant aspects		Isabel	Jorge	
MC - Problems in previous experiences	Jorge	Lidia Antonia		
MC - Potential problems	Antonia Jorge	Lidia Isabel		
Total		15	23	18
Jorge		9	3	2
Lidia		1	6	8
Isabel		4	8	1
Antonia		1	6	7

Note: PE, Physical Education; ME, Music Education; MC, Methodological Considerations.

An analysis of Table 2 reveals several key insights. First, the aggregate data shows a clear predominance of the practical perspective (23 total entries), followed by the innovative (18) and traditional (15). This overarching trend suggests that while the teachers are open to new ideas, their primary concern is grounded in the functional and logistical aspects of implementing interdisciplinary work in their school. The individual teacher profiles, however, show significant variation, highlighting the diverse range of attitudes within the faculty:

- Lidia (PE) and Antonia (Music) emerge with a strong blend of innovative and practical views. They frequently discuss concepts like student autonomy and transversal learning, indicating an enthusiasm for transformative pedagogy. At the same time, their focus remains on what is achievable and beneficial for students in a tangible way. Their profiles suggest they are the most likely champions for this type of interdisciplinary project.
- Isabel (PE) is predominantly practical, with some traditional leanings. Her perspective is that of a hands-on educator focused on what works in the classroom. While she sees the value in interdisciplinary activities, her approach appears more conventional, as seen in her views on dance benefits and prior experiences.
- Jorge (PE) represents a largely traditional viewpoint (9 entries), especially concerning the definition, objectives, and difficulties of interdisciplinarity. His responses suggest a more siloed view of subjects and a greater skepticism toward pedagogical change. His perspective is crucial as it represents a potential barrier to implementation that must be understood and addressed.

Having established this framework of teacher perspectives, the following sections present the detailed findings from the thematic analysis, organized by the three core dimensions that emerged from the data: Dance, Learning, and Interdisciplinarity.

Dance

Dance benefits

The participants unanimously agreed that dance offers multiple, holistic benefits for students. Beyond simple physical activity, they saw it as a tool for developing a wide range of interconnected skills. Jorge articulated this comprehensive view, explaining that dance “improves their physical capacity, enhances



cooperation among students, and advances the development of their basic skills and abilities". He further emphasized how these skills are interwoven, noting that even seemingly simple actions are connected to rhythm and spatial awareness: "In terms of coordination, for example, even bouncing the ball has a rhythm, and regarding spatial awareness, you need to know how to orient yourself for a throw, so everything is interconnected. ... You're working on every block indirectly" (Jorge). This comment highlights a key perception among the teachers: dance is not an isolated activity but a medium through which fundamental physical, motor, and cognitive skills are developed simultaneously.

Prior experience in dance

The interviewees reported that dance was already an established part of their curriculum, often through a dedicated unit on cultural dances. However, they described a pedagogical progression that adapts to the students' age, moving from structured imitation to creative expression. This evolution fosters student growth: "When they're very young, they're taught from the cha-cha-cha ... simple dances, ... rotational movements, in pairs or in groups. As they get older, they move on to more complex dances. They form groups and create their own dance" (Lidia). This approach shows that teachers already use dance not just to teach tradition, but also to cultivate creativity and collaboration as students mature.

Learning

Transversal learning

All participants agreed on the necessity of teacher coordination to achieve effective transversal learning. They viewed this collaboration as a way to provide students with durable skills for their future. Antonia powerfully described this forward-looking goal, framing it as preparation for life beyond the classroom:

"Coordination is necessary... We need to look for something that benefits the student, something that makes them think, that makes them coordinate, that they can apply in other areas. Even if they are not doing it right now, even if they won't do it right now, they must be aware that it's very likely they will need to work in a team in the future. They need to be aware that the pace will keep changing, sometimes constant and sometimes not. It should give them flexibility, the time to do things, to undo them, and to have that rhythm that allows them to adapt rather than hide" (Antonia).

Her statement underscores that, for these teachers, the aim of transversal learning is not just academic integration but fostering adaptability and resilience in students.

Functional learning

A strong consensus emerged around the need for learning to be functional, practical, and rooted in the students' everyday reality. The teachers advocated for adapting their methods to include modern technology and current youth culture to enhance motivation. Antonia provided a vivid example, contrasting traditional methods with more relevant, tech-integrated activities:

"I can't expect to teach a child a traditional dance with the techniques used fifty years ago when we now have different tools... Maybe it's more motivating for them, instead of me teaching them 'sevillanas,' that they create their own dance, record it, and upload it to TikTok. ... Well, now we're going to include elements such as a mat or ribbons from artistic gymnastics, balls, balloons, things that make them think, or even everyday items. Let's create a rhythm, the usual way, right? With plastic cups, and we have to connect that rhythm with something else. Or a circuit with different rhythms, for instance" (Antonia).

Isabel reinforced this idea, emphasizing that this approach leads to more profound understanding. She stated that learning activities should be "more practical ... related to meaningful learning ... transferable to their daily lives... and in this way it will be more meaningful". Together, these comments show a shared belief that functional learning is achieved by bridging the gap between formal curriculum and the students' lived experiences.

Student autonomy

The interviewees identified specific pedagogical strategies to cultivate student autonomy. Rather than leaving students entirely on their own, they described a process of guided learning where responsibility is gradually transferred, such as the "cascade learning" or peer-teaching method:



“Let them be the assistant to whom a task is assigned, and they explain it to their group ... and then those groups, those trainers ... can switch, and each will inform different groups about that task. That way, you can always incorporate something ... the first time over several sessions, but then the children, through imitation, already know how to start and how to continue. So then, each day I just choose an assistant, and they themselves carry out the class and guide everyone else” (Lidia).

Another learning approach mentioned was the “station-based model”, which not only promotes autonomy but also differentiation and self-awareness. In this model, different groups can take on different roles: some dance, others compose, some manage sound or materials. This approach allows students to contribute based on their unique abilities:

“In each station, in groups. Each group would be responsible for teaching something to their classmates for a certain period of time, so that by the end of that period all the students have gone through all the stations and learned something. Then we look for a final product, which could be coordination, a set rhythm, a dance, a choreography, a song, or a presentation. ... It doesn't have to be that everyone does the same thing. For instance, some dance, others play, others compose, others make sure everything is going correctly, another could be the sound technician, another the materials manager ... because we are not all the same, we don't all have the same requirements or the same levels. In other words, everyone feels useful within the available roles. Each person should recognize what their strong point is and what their weak point is. ... so I can offer others the best of me. ... By being able to use our bodies and expression in different ways beyond verbal expression, we can accomplish many things and open their eyes, right? People who don't share our verbal capacity or physical abilities still manage to express themselves and communicate” (Antonia).

This strategy demonstrates a sophisticated understanding of autonomy, linking it not just to independent work but to self-reflection, collaboration, and an inclusive classroom environment where every student can contribute meaningfully.

Interdisciplinarity

Definition and objectives

The interviewees shared a cohesive understanding of interdisciplinarity, defining it as the interrelationship between two subjects through shared objectives to foster more comprehensive student learning. This theoretical alignment was supported by their ability to identify concrete, shared pedagogical goals between PE and Music Education, as they saw natural overlaps in working on rhythm, movement, body awareness, and coordination. They also envisioned incorporating multiple educational aspects like music from various cultures or the use of foreign languages:

“With music, rhythm, dance, sound, music from different cultures—even flamenco. In other words, various songs in English, introducing different languages, can be linked to PE's motor skills ... movement, dance, body movement, body awareness, and even coordination. When you perform a dance that involves balance—say, if they dance on one leg or something similar—you can blend motor skills with the music's rhythm” (Lidia).

This demonstrates that the teachers' conception of interdisciplinarity is not abstract but grounded in tangible, cross-curricular opportunities they already see in their daily practice.

Perspectives from Physical Education

The PE teachers viewed their subject as a natural and highly effective hub for interdisciplinary work due to its practical and dynamic nature.

Relationship with other subjects: A versatile nexus for learning

They explained that PE can be easily linked to nearly any other subject using practical activities and motor skills games. This allows for dynamic, varied classes that can incorporate multiple subjects:

“It's very easy to link PE with any subject, because you can teach children math concepts by counting as they throw balls, ... adverbs by playing games as we jump, ... prepositions as they jump, we can use music by dancing while coordinating motor skills with classmates, and it can be linked to English by teaching

classes in English and giving actions and instructions in English, ... to environmental studies, by conducting a PE class in the park ... and you're giving it a different setting. ... PE can be very well adapted to interdisciplinarity in all areas" (Lidia).

This positions PE as a strategic anchor for integrating the wider curriculum.

Impact on students

According to the participants, A key benefit identified when integrating objectives from other subjects into PE was the enhancement of students' interest and motivation, making abstract concepts from other subjects more tangible and appealing. By grounding learning in physical activity, teachers can capture students' interest in topics they might otherwise find "a bit boring":

"Any objective or criterion they want to work on with [the students] in another subject—maybe it's a bit more serious or ... something they find a bit boring—if you bring it into PE, it can grab their attention much more and they'll like it more. That will give them a more comprehensive view of learning, and it could even ... facilitate learning in other areas" (Lidia).

Jorge added that this connection to the students' physical reality makes learning more memorable and meaningful: "the more subjects included in that learning, ... the more the student will associate it with that learning".

Difficulties

The challenges identified were not pedagogical but logistical and relational. The main barrier was the lack of time and commitment on the part of teachers. Interdisciplinary projects require ongoing coordination and agreement between multiple teachers, which was seen as a significant hurdle in the busy environment of a school: "The main difficulties we might encounter are that there are several teachers, and obviously, multiple teachers must reach an agreement. The available time, the materials at hand—all those factors. I think they are quite important" (Isabel).

Perspectives from Music Education

Relationship with other subjects: An Intrinsic Connection to the World

Antonia, the Music Education specialist, described her subject as inherently interdisciplinary, connected to the fundamental patterns of life and education, such as mathematics, history, and natural and cultural rhythms. She argued that music is not an isolated art form but a lens through which to understand the world.

"Music is part of our lives, ... part of our daily routine, our customs. And if it isn't part of things like, for example, mathematics, ... music is pure math, so you have an enormous connection there. For instance, anything like history, ways of thinking, the rhythm we follow throughout the year. There's always a rhythm: day and night are already a rhythm, our way of life, whatever style it may be... It's Christmas now, then Easter, then the fair. There you've got the rhythm. Easter Week has a rhythm. The fair has another rhythm. Christmas has another rhythm. Our daily lives... the rhythm I have in the morning is not the same as the one I have at night or when I'm sleeping. The body's own biorhythm, for instance" (Antonia).

This perspective frames music as a profound and versatile partner for interdisciplinary exploration.

Impact on students

Consequently, the impact of interdisciplinary music projects was described as deep and lasting. The goal moves beyond academic performance to something more personal. As Antonia eloquently put it, "it's not learning to pass an exam, it's learning in order to internalize, to be able to carry out something that will be useful to them in the future or that they can extrapolate even further." She saw music as providing "a personal tool that's applicable to your entire life", enabling a form of expression that transcends words: "maybe I can't say it to you, but I can sing it to you" (Antonia).

Difficulties



The logistical challenges of implementing interdisciplinary projects in Music Education are similar to those in PE, including limited time, lack of coordination among subjects, and the requirement for additional teacher effort and careful planning to be effective.

“Lack of time, or some teachers of other subjects might not see it as compatible, or there may be insufficient coordination; so, when you’re trying to do this, the other person is a step ahead or behind, and it doesn’t line up. It’s not just a matter of time but that it doesn’t align schedule-wise, and so it doesn’t have the same impact” (Antonia).

While facing the same logistical issues as PE, Antonia highlighted a unique pedagogical challenge: encouraging students to engage in autonomous thinking. She noted that students can resist this process: “The problem ... might be that it makes them think. This is something that’s been forgotten – ‘It’s so hard to think,’ ‘it’s difficult,’ or ‘it can’t be done,’ because everything is given to us automatically and everything always has to be easy.” The main difficulty, she argued, is overcoming the mindset that “it’s so hard to think,” and instead cultivating students who are “capable of doing things on their own, rather than having the teacher or whoever do it all for them. It shouldn’t be automatic” (Antonia).

Dance as a unifying link

Across all interviews, there was unanimous and enthusiastic agreement that dance is the ideal bridge between PE and Music Education. The participants saw it as a fundamental pillar for both areas, perfectly embodying their shared elements (e.g., coordination, motor skills, rhythm, and autonomy), making it a valuable resource for students’ comprehensive education. Lidia summarized this consensus clearly:

“Dance is important for students on both a motor and psychomotor level. It’s important because they must have balance, rhythm, good eye–hand–foot coordination when moving, and they also have to work on memory to remember the steps, etc. And then there’s music. In music, it’s essential for dance. ... It provides the rhythm, the guide, what makes the child know what they have to do at any given moment. It leads them. So, I think it’s a good way to link them” (Lidia).

This shared view confirms the study’s central premise and suggests a strong foundation of pedagogical support for implementing dance-based projects.

Methodological considerations for implementation

Finally, the teachers discussed the practical aspects of designing and executing interdisciplinary projects, drawing on their prior experiences.

Prior experience in interdisciplinary projects: building on past success

The teachers were not new to interdisciplinary work. They cited positive experiences in school-wide interdisciplinary projects, emphasizing the importance of coordination and autonomy in activities such as festivals and exhibitions. One example is the Sports project, where students take part in choreographies and activities requiring both individual and group physical and cognitive coordination.

“In our case, with the Sports event, there are certain presentations by different age groups, such as routines that include a choreography... often, they are given autonomy to come up with ideas themselves; other times they’re given set material. ... There’s coordination not only in a physical sense but also mental and team based.” (Antonia).

Another interdisciplinary project mentioned involved the creation of dances from around the world, integrating both PE and Music.

“They had to do a spatial orientation walk. And in Secondary, we worked together with Music and created a project where they performed dances, for instance, from around the world, which they were addressing in both PE and Music” (Jorge).

These past projects taught them valuable lessons about teamwork and coordination, with Antonia noting that interdisciplinary projects teach students “how to work, how to accept your colleagues’ proposals or presentations, how to integrate them, how to combine them, what works, what fits, how to measure time—both rehearsal time and music timing, as well as movements. Those kinds of things” (Antonia).



Relevant aspects for interdisciplinary projects

The teachers identified a triad of crucial elements for any successful project: logistical readiness; coordination among teachers; and a student-centered focus. On the one part, logistical readiness relates to “having a viable space ... preparing the necessary materials. And ... flexibility” (Lidia).

On the other part, coordination and time between the teachers were mentioned as critical factors for creating “a comprehensive project that is realistic and can be put into practice, because often the theory cannot be carried out in practice. So we have to agree, and we need to make the project as realistic as possible” (Isabel).

Student motivation was also identified as an important factor, suggesting that teachers “need to find something that motivates the students. ... it should come from the students’ reality. There are always dances that motivate the kids, as well as music. And those generally have more success.” (Jorge). Finally, regarding the student being the main focus of the interdisciplinary approach, Antonia summarized its ultimate goal as finding “unifying links ... that works well for both subjects and yields a benefit. ... it’s about benefiting the students. Which activity will I carry out that will best foster the student’s potential and be most useful to them in the future?”

Problems in previous experiences and potential problems for interdisciplinary projects

Past challenges were described as manageable issues, such as foresight to overcome logistical setbacks (i.e., weather conditions or technical failures, and lack of time and commitment), student preferences or social dynamics:

“The intrinsic problem might be with the kids who, for instance, don’t like dancing as much, or if you don’t have the proper spaces, don’t have the materials, or haven’t prepared the sessions well. But usually there shouldn’t be a problem. Problems often arise, for example, when boys don’t like dancing with girls. That kind of problem, but if you guide it correctly, it shouldn’t be an issue” (Jorge).

However, they identified a more significant potential threat: the devaluation of arts-based projects within the academic hierarchy. Antonia expressed the fear that projects could be rejected for being deemed less important than other academic areas, “because it’s more important to teach equations or something else, relegating you to the background” (Antonia). This highlights a critical external barrier that could undermine even the most well-designed interdisciplinary initiative.

Discussion

The main objective of this study was to explore the perceptions of PE and Music Education teachers regarding interdisciplinarity and the role of dance as a unifying link between these subjects. The findings showed how dance can serve as an interdisciplinary bridge between PE and Music Education, fostering teacher collaboration and cross-curricular learning. For the teachers in this study, dance provides students with multiple benefits, including improved coordination, rhythm, and spatial awareness. Likewise, the results confirmed teachers’ interest in expanding and diversifying learning experiences, identifying several key aspects for successful interdisciplinary projects, such as the availability of appropriate spaces, teacher coordination, and student motivation. Nonetheless, challenges were also highlighted, such as limited time and the need for more robust joint planning.

Several recent studies support the potential of dance as a unifying element of various disciplines in educational contexts (Appiah et al., 2023; Engdahl & Ceder, 2023; Gripson et al., 2022). For instance, it has been found that offering rhythmic and choreographic activities enhances motivation and student engagement in both PE and music-related curricular settings (Bremmer, 2023; Mattsson & Larsson, 2021). This aligns with research that advocates experiential learning, in which students are actively involved with the material (Kibirige, 2023; Moore et al., 2023). Moreover, incorporating dance into teaching practice facilitates mobility, rhythm, and creative expression—factors that positively impact students’ holistic development (Kaja et al., 2023; Stojadinović et al., 2020). The consistency of these findings with existing literature suggests that dance-based methodologies strengthen interdisciplinary collaboration, fostering more meaningful learning (Chen et al., 2022; Wang, 2022).



The main findings indicate that using dance successfully integrates elements of music and PE, producing a practical, holistic form of learning that goes beyond mere physical movement to encompass cognitive and affective aspects (Engdahl & Ceder, 2023). In this regard, dance facilitates body self-awareness, musicality development, and creativity stimulation (Mattsson & Larsson, 2021; Ørbæk & Engelsrud, 2021). The improvements in coordination, rhythm, movement, and balance identified in this study represent more than isolated physical skills; they constitute transferable competencies that support development across academic areas. Research by Stojadinović et al. (2020) demonstrated that an integrated learning approach combining PE and Music Education significantly improved coordination skills in primary school students compared to traditional separate teaching approaches. Furthermore, the holistic experience of dance allows students to embody musical concepts like rhythm, tempo, and dynamics while simultaneously developing motor skills, spatial awareness, and coordination (Giguere, 2011). Linking the findings to the literature underscores the potential of dance as a tool to enhance rhythmic skills, group belonging, and intrinsic motivation (Andrieieva et al., 2023; del Barrio & Arús, 2024). It is also worth noting that the complexity and variety of choreographies allow the methodology to be adapted to various educational contexts (Bremmer, 2023), reflecting the relevance of adopting a flexible approach.

Dance as an interdisciplinary bond also offers unique opportunities to foster student agency and self-direction. When students create original choreography, they demonstrate embodied knowledge and creative problem-solving while exercising autonomy in their learning (Giguere, 2011). This creative dimension of dance education supports identity development and self-expression, important aspects of holistic education. Student choice within structured dance activities enhances motivation and engagement, as found in this study. When given opportunities to make decisions about movement qualities, musical interpretation, or thematic content, students demonstrate greater persistence and higher levels of engagement (Amado et al., 2017). This autonomy-supportive approach aligns with contemporary educational values that emphasize student voice and choice (Ryan & Deci, 2017). Collaborative choreography further promotes democratic participation and shared decision-making. Through negotiating creative choices with peers, students develop communication skills, respect for diverse perspectives, and collective responsibility—competencies essential for citizenship education (Giguere, 2011).

These findings can be understood within several complementary theoretical frameworks. Dewey's Experiential Learning Theory (Dewey, 1938) provides a foundation for conceptualizing dance as an authentic learning experience that bridges abstract musical concepts with physical embodiment. Through dance, students engage in concrete experiences, reflect on their movements, conceptualize musical patterns, and actively experiment with creative expression. Similarly, Vygotsky's (1978) sociocultural theory supports the pedagogical value of dance, as it creates zones of proximal development through peer collaboration and teacher guidance.

Furthermore, dance serves as a powerful vehicle for cultural transmission and understanding in primary education. Through learning traditional folk dances, students connect with cultural heritage while developing physical and musical skills simultaneously (Lorenzo-Lasa et al., 2007). This cultural dimension of dance education promotes appreciation for diversity and helps students develop cultural literacy.

The aesthetic dimension of dance education further enriches students' educational experience. Drawing from the Greek concept of "aesthesia"—encompassing perception, cognition, and understanding—dance engages students in multisensory experiences that foster holistic development. This aesthetic education integrates arts, music, and physical movement to cultivate critical thinking, problem-solving, and communication skills through creative expression (Dincher, 2022). As Eisner (2002) argued, arts education, including dance, develops forms of thinking and understanding that other subjects cannot provide. Through dance, students learn to make qualitative judgments, navigate ambiguity, and express ideas through non-verbal modalities—skills increasingly valued in contemporary educational contexts (Giguere, 2011).

Practical implications

The findings from this study suggest several key implications for teaching and curriculum design. First, systematically incorporating dance into curriculum planning could strengthen the connection between PE and Music Education, optimizing resources and creating meaningful learning experiences. Second, there is a marked need for ongoing teacher training in choreography skills and in assessing student



progress in dance-related activities. Third, integrating digital technologies—such as using mobile applications like TikTok for creating and practicing choreographies—can increase student interest and promote the development of digital competencies. In this way, autonomy and collaboration inside and outside the classroom would be enhanced.

Limitations

Among the limitations, there is a lack of variability in terms of type of participants: only teachers have been included in this research, while it does not capture the lived experiences of the learners, who are the ultimate participants in these interdisciplinary projects. Moreover, the use of a qualitative methodology— and therefore the lack of standardized instruments to quantitatively measure dance's impact on curricular transversal skills—may have constrained the generalization or scope of the results. Similarly, the variability of resources and infrastructure in different schools may have influenced how these dance activities were implemented among participating teachers (Bremmer, 2023).

Conclusions

In conclusion, the findings of this study highlight the effectiveness of dance as an interdisciplinary link between PE and Music Education for primary-level teachers, boosting student motivation and fostering teacher collaboration. The results broaden the discussion around teaching dance as a central element of learning in early educational stages. Consequently, the educational community is encouraged to view dance not simply as an artistic expression but also as a valuable educational resource for knowledge integration, competence development, and the dissemination of innovative interdisciplinary teaching methods.

Future research could focus on designing interdisciplinary interventions that systematically incorporate dance at various educational levels and with various educational agents, such as students or parents, in order to evaluate student progression. It would also be worthwhile to develop standardized, quantitative assessment tools that capture physical-motor as well as musical and emotional components of dance. Moreover, investigating how dance can facilitate inclusive learning and teaching adaptability to students' specific needs would be valuable. Finally, exploring the use of emerging technologies in dance education could help identify new strategies for motivation and personalized learning.

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