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PROMOTING MUSIC LEARNING IN CHILDREN WITH CEREBRAL PALSY: THE PERSPECTIVE OF MUSIC PROFESSIONALS

ABSTRACT

To promote access, participation, and success for children with Cerebral Palsy (CP) in the Arts Education Programmes of Music (AEPM), we started an action research project in 2018. To this end, we have already carried out: initial awareness training for music education teachers; the characterisation of the child with CP that gave rise to the study; and three integrative literature reviews to find out the state of the art in this area. As a result of this work, there was a need to highlight the needs of professionals working with children with disabilities (hearing, visual, motor, intellectual, and communication) to improve their practices. To this end, interview scripts were drawn up and validated by professionals specialising in technology, music education, school inclusion, and health. Based on these scripts, we interviewed 14 music professionals who had already been working with children with disabilities in their classes between January 2021 and January 2022. These interviewees authorised the audio recording and processing of their interviews through informed consent. The interviews were transcribed and validated by the respective interviewees. The content was analysed using webQDA software. The results show that teachers are unaware of current methodologies and strategies for working with children with CP in the AEPM, as these children do not attend this type of education. In addition, teachers have little knowledge of their specific needs, and neither the knowledge nor the Assistive Technologies to facilitate these children's communication and participation in the AEPM. Finally, the results demonstrate the need to promote teacher training in this area and implement changes in educational policies to transform Artistic Music Education, and more specifically the AEPM, into an education for all.

Keywords
Arts Education Programmes of Music; Cerebral Palsy; Content analysis; Interviews; webQDA.

1. Introduction

In Portugal, educational inclusion is fundamental per current legislation (Decree-Law nº 54/2018, Decree-Law nº 55/2018). However, Artistic Schools (AS) are unprepared to welcome children with motor and communication disabilities from Cerebral Palsy (CP). This became evident when a mother chose not to enrol her child with CP in Arts Education Programmes of Music (AEPM), feeling that necessary conditions were absent (Moreno et al., 2020).

Arts schools lack preparation for children with CP who have motor and communication impairments (Alves, 2020; Valério & Schambeck, 2021). Rigid curricula sometimes require children with communication difficulties to take choir lessons. Schools often lack assistive technologies needed for participation (Alves, 2020; Moreno et al., 2023a; Moreno et al., 2025).

Studies reveal that music teachers face challenges, including a lack of methodologies for children with CP (Valério & Schambeck, 2021), limited knowledge of CP-specific needs (Tavares-Netto et al., 2022), and minimal experience, as children with CP rarely attend music schools (Wangui, 2019). Research emphasizes the urgent need for teacher training and policy changes (Alves, & Fernandes, 2022; Valério & Schambeck, 2021).

In response, an Action Research (AR) project began in 2018 to promote inclusion of children with CP in AEPM (Davanzo et al., 2023; Moreno et al., 2023a; Moreno et al., 2025). We characterized the inspiring child (Moreno et al., 2020), conducted Initial Awareness Training for 60 Music Professionals (MP) (Moreno et al., 2023b), and completed several literature reviews (Moreno et al., 2022; Moreno & Maia, 2022). This article arises from the need to understand in detail what MP require to work effectively with children with CP.

To address these challenges and safeguard all ethical issues involved, we conducted 14 interviews with MP who work with children with Special Needs (SN).

2. Objectives

This study aims to identify the challenges music professionals face when teaching children with CP and to understand the strategies, methodologies, and solutions they have developed to promote inclusive music education. To this end, an interview guide was created, consisting of eight specific objectives and questions defined for each objective (Table 1).

Table 1 - Objectives and questions

Objectives	Questions
O1: To introduce, 'break the ice' and get to know the respondents' professional experience.	Q1. Tell us a little about your professional experience in teaching music or music therapy.
O2: To find out what level of knowledge the MP interviewed consider they have about the use of Technology/AT in their practices.	Q2. What do you consider to be your level of knowledge about DT and AT that can be used to promote the Learning of children with SN?
O3: To assess the MP's knowledge and experience with AT in their professional practices.	Q3. Do you know of any DT to support music teaching for students with SN? What AT do you know? Can you specify? Which DT or AT have you used or felt the need to use in the development of your classes or therapies? Why? Which ones? How? Can you specify?
O4: To understand how teachers deal with the issue of inclusion and accessibility, and to what extent they feel prepared to include children with SN.	Q4. How do you ensure that the artistic, musical or therapy activities you carry out professionally are accessible to students with SN? Can you specify?
O5: Identify the experience that MP has in their practice with children with motor and communication limitations due to CP.	Q5. Have you ever worked with pupils with motor and communication difficulties due to CP? In what contexts?
O6: To find out what adaptations MP have had to make to achieve results in the learning or therapy of their pupils/patients.	Q6. What adaptations have you had to make to your teaching or therapy methods?
O7: Identify the results they achieved with the adaptations they implemented in their practice, and, above all, what needs they felt.	Q7. What difficulties or benefits have resulted from the adaptations you have made to your practice?
O8: Open questions for any issues that the MP consider relevant and not covered by the questions posed.	Q8. Are there any other aspects that you think are important to mention?

Table 2 shows eight open questions, each with a specific objective. Questions Q1-Q3 establish rapport by exploring respondents' knowledge/experience with music teaching technologies. Questions Q4-Q7 examine accessibility, adaptations, and MP' experience with children with SN, especially those with motor disabilities from CP. Question Q8 allows respondents to raise relevant issues that were not previously covered.

3. Methodology

Knowledge is acquired through searching, observing, analysing, and studying. As teacher-researchers, we obtain knowledge by addressing problems and compiling information (Amado 2017; Coutinho 2018). After examining educational research paradigms—Empirical, Quantitative, Positivist, Interpretive, Qualitative, Emancipatory, Critical, Theoretical-Critical, and Socio-Critical (Amado, 2017; Coutinho, 2018)—we determined our research required qualitative methods to understand the meaning of events and interactions for ordinary people in particular situations (Coutinho, 2018), revealing procedures for knowledge acquisition (Pardal & Lopes, 2011).

Thus, we assume that '...the Teacher as Researcher aims to develop their research methodology, a methodology that recognises the cooperative and flexible nature of their discipline...' (Olson, 1991, p.7).

For data collection, we needed qualitative information on people's perceptions, thoughts, feelings, and experiences. We created an interview guide aligned with our research questions to identify the challenges music professionals face when teaching children with CP and to understand the strategies, methodologies, and solutions they have developed. We validated this guide with professionals in technology, music teaching, school inclusion, and health before conducting our interviews.

3.1. Interview Surveys

Since the aim of our interviews was to obtain in-depth information, careful attention was paid to selecting participants. We worked with an intentional sample, selecting participants according to clearly defined criteria for each situation.

Between January 2021 and January 2022, with the collaboration of the Cerebral Palsy Association (CPA) and the Technology and Communication Resource Centre (CRTIC) in Portugal. We interviewed 14 MP who work with children with SN. The interviewees authorised the audio recording and processing of their interviews through informed consent. The interviews were transcribed in Word and validated by the respective interviewees.

3.2. Qualitative data analysis

We processed all compiled information using content analysis with WebQDA software (Costa & Amado, 2018), which helped organize and systematize data analysis for our descriptive qualitative methodology. Interview transcripts were uploaded to webQDA's Internal Sources system. We began by identifying the most frequent words to create a word cloud that guided our coding process. We inductively analysed the data by reading responses, identifying patterns, and comparing findings. Since questions were open-ended, responses often extended beyond specific questions. We categorized the text segments inductively and organized them thematically into dimensions and categories, which are detailed in section 4. We then analysed category frequencies, indexed research subjects under 'Classifications' to relate them to the analysed categories, and used the 'Matrices' tool for further questioning based on category frequency.

3.3. Resolution and Approval of the Ethical Issues Involved

To safeguard ethical and deontological principles, the researchers developed protocols and informed consent forms addressing ethical issues and data protection.

These documents were submitted to the Ethics and Deontology Council (EDC) for approval and received a registered approval no. 28-CED/2019 EDC in plenary meeting of July 7, 2021.

All participants were informed about the study's purpose, the voluntary nature of their participation, and their right to withdraw at any time without consequence.

The informed consent process ensured that participants understood how their data would be collected, stored, and used, in full compliance with GDPR regulations. Audio recordings were made only with explicit permission, and all identifying information was anonymized during transcription and analysis to protect participant confidentiality.

4. Results

We interviewed 14 Music Professionals (MP) who work with children with SN with objectives focused on understanding their practical experiences, challenges, and solutions in inclusive music education.

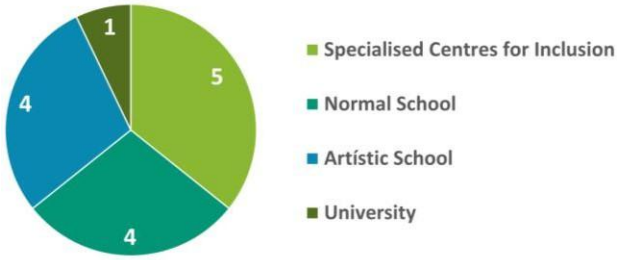


Figure 1. MP Interviews - workplaces

The sample included one professor who works at a university, five teachers who work in specialised centres (e.g., CPA), four teachers mainstream schools, and four art school teachers (see Fig. 1). Three of the 14 professionals had never worked with children with CP, while the remaining 11 had worked with them at least once.

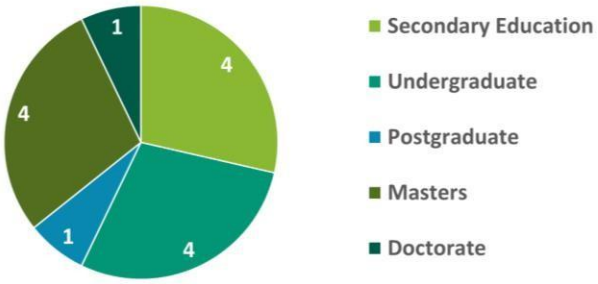


Figure 2. MP Interviews - education level

Fig. 2 shows the diverse educational backgrounds of the MP interviewed: four professionals have secondary education, four have a bachelor's degree, four have a master's degree, one has a postgraduate degree, and one has a doctorate.

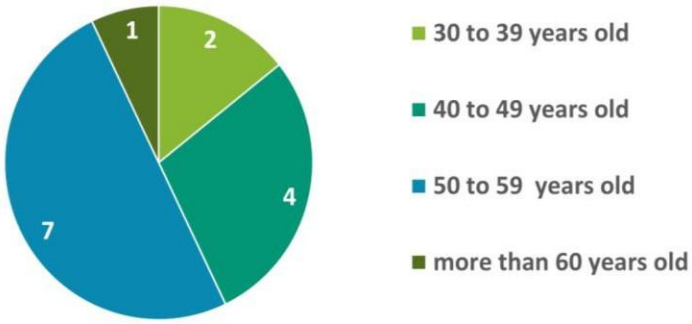


Figure 3. MP Interviews - age of interviewees

Regarding age distribution (Fig. 3), most of the 14 MP are over 50, with seven of them aged between 50 - 59 and one over 60. We can also see that two of the PEMs are between 30 - 39 years old and, four are aged 40 - 49.

Figure 4 presents the content analysis of interview responses regarding participants' academic and professional backgrounds. Numbers in parentheses indicate response frequency. We were able to obtain information about this path by organising the compiled information into categories related to the MP's profession, training, and experience (working with children with EN).

The information compiled in these categories has been organised into subcategories representing the Enjoyment of the profession / rewarding results (7) and the Influence of renowned authors/mentors (17) who have introduced some renowned musicians and teachers into their lives. We also compiled information in subcategories that refer to Classical training/Conservatory/AS (11) and the autonomous training path (5) that some MP have had. The information compiled in the Experience category was organised into the subcategories: Existence of stigmas in society (12); Questioning of practice (6); and The initial shock/impact (6). It should be noted that the numbers in brackets next to each subcategory refer to the frequency with which these answers appear.

The data reveal that despite their dedication and experience, these professionals encounter significant challenges when working with children with SN. A notable finding is the persistence of social stigmas, which appears frequently in the responses. Additionally, many music professionals engage in critical self-reflection on their teaching practices, and several reported experiencing an initial shock or impact when first working with children with cerebral palsy or other special needs.

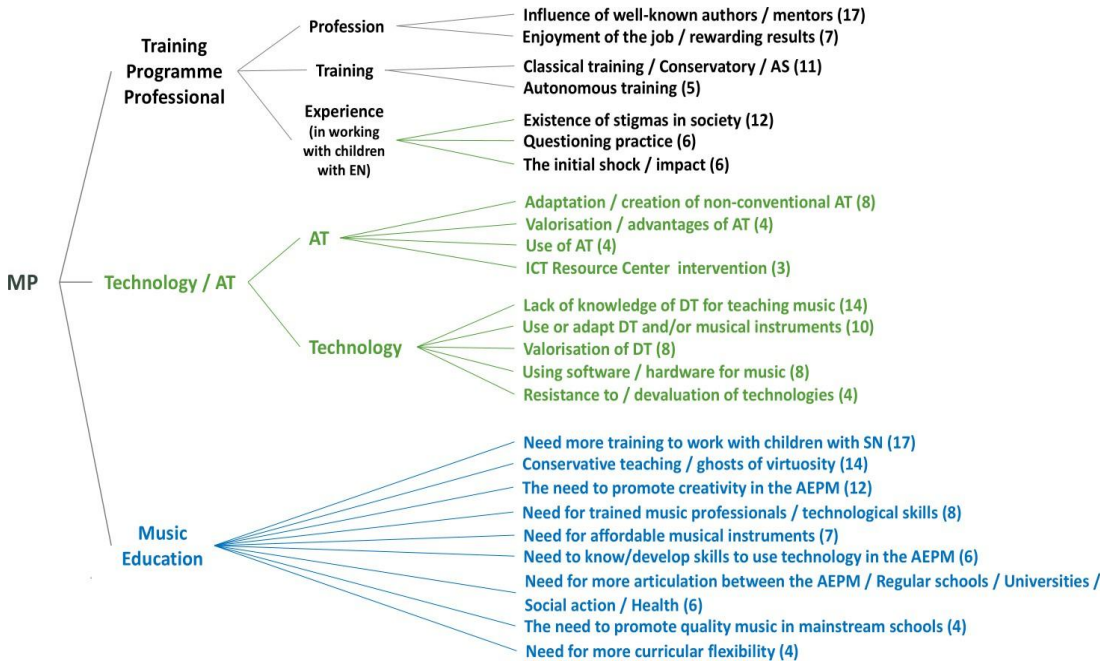


Fig. 4. Categories: Training Paths, Technologies/AT and Music Teaching

The Technologies/AT category organised information about Technologies and assistive technologies (AT). The subcategories related to Technologies include Unfamiliarity with technologies for teaching music (14); Using or adapting technologies or Digital Musical instruments (DMI) (10); Valuing technologies (8); Using software/hardware for music (8); Resistance to/depreciation of technologies (4). We then compiled the information into subcategories related to AT: adaptation/creation of non-conventional AT (8); appreciation/advantages of AT (4); use of AT (4); and CRTIC intervention (3).

The findings indicate a paradox: while many teachers recognize the value of technologies and assistive technologies for supporting children with SN, there is widespread unfamiliarity with specific technologies for teaching music.

Lastly, the information related to Music Education was organised into Categories addressing: Need for more training to work with children with SN (17); Conservative teaching/ghosts of virtuosity (14); Need to promote creativity in the AEPM (12); Need for prepared teachers/technological skills (8); Need for accessible musical instruments (7); Need to know/develop skills for using technology in the AEPM (6); Need for more articulation between the AEPM/regular schools/universities/social work/health (6); Need to promote quality music in the regular school (4) and; Need for more curricular flexibility (4).

Despite these challenges, the research also reveals that music professionals demonstrate remarkable adaptability, creativity in developing non-conventional assistive technologies, and a strong commitment to student-centered teaching approaches.

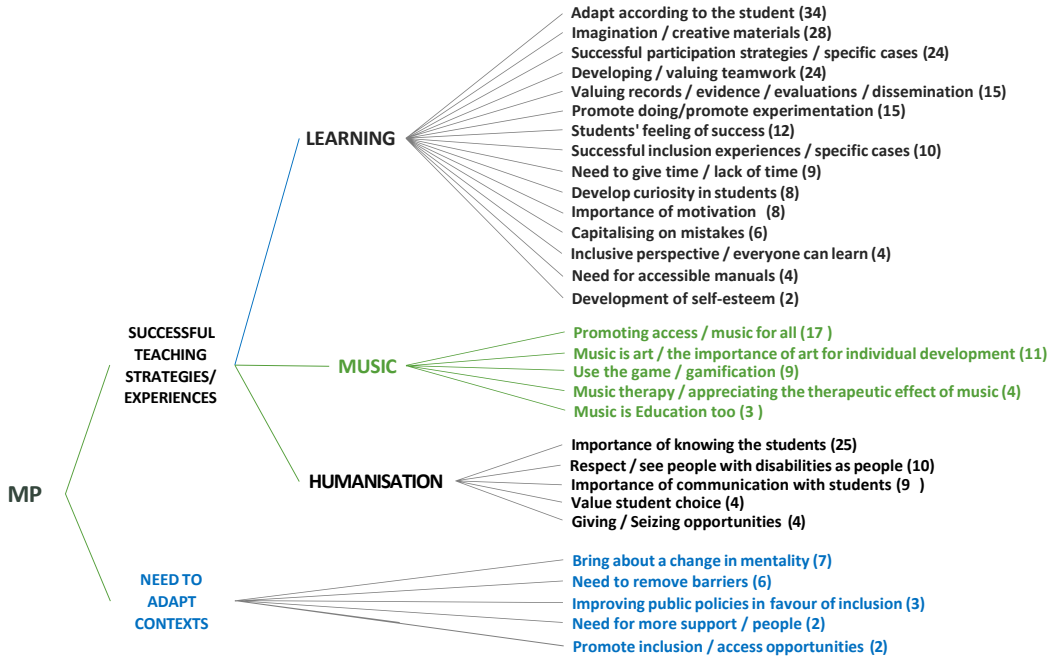


Figure 5. MP Information - Categories related to success strategies and experiences

Continuing with the categories from the MP interviews (see Table 1), Fig. 5 shows information about the respondents' Strategies and Experiences of success, organized into three main areas:

(I) LEARNING: Adapting according to the student (34), Using imagination/creative materials (28), Successful strategies for participation/specific cases (24), Developing/valuing teamwork (24), Valuing records/evidence/evaluations/dissemination (15), Promoting experimentation/doing (15), Promoting students' sense of success (12), Experiences of success in inclusion/specific cases (10), Need to give time/lack of time (9), Developing curiosity in students (8), Importance of motivation (8), Making the most of mistakes (6), Inclusive perspective/everyone can learn (4), Need for accessible textbooks (4), and Developing self-esteem (2).

(II) MUSIC: Promoting access/music for all (17), Music is art/importance of art for individual development (11), Using play/gamification (9), Music therapy/valuing the therapeutic effect of music (4), and Music in Education (3).

(III) HUMANISATION: The importance of getting to know students (25), Respecting/viewing people with disabilities as people (10), The importance of communicating with students (9), Valuing student choice (4), and Giving/taking advantage of opportunities (4).

Finally, we also organised information related to the NEED TO ADAPT THE CONTEXT, into categories: Causing a change in mentalities (7); The need to eliminate barriers (6); Improving public policies in favour of inclusion (3); The need for more support/people (2), and Promoting inclusion/opportunities for access (2).

Below are examples of MP answers to the questions (see Table 2), which relate to each theme identified and were established according to our research objective. To safeguard participants' anonymity, each MP has been assigned a number (e.g., MP1, MP2, etc.).

Table 2. Some examples of answers and their discussion

OBJECTIVES (Table 1)	SOME EXAMPLES OF ANSWERS	
O1	*I see the work that Prof Paulo Jacob does with those young people ("5ª Punkada", "Ligados às Máquinas") and we are amazed and captivated by it. It's marvelous (MP11); The people who work at CPA love what they do, but they feel powerless because they lack resources (MP8); I went looking for help, I studied psychology, new technologies, and other courses (MP6).*	*The information compiled suggests that the MP have a love of their profession, which yields gratifying results in the development of their practice. Several have classical conservatory training, and some have pursued additional independent study. Some have experience working with children with CP, while others mention questioning their own practice.*
O2	*I'm very interested in music technology, but I don't have access to these materials (MP12); This has given me a different background in using technology. That's how I learned to use Music-Beam, Makey-Makey, MAGIC Music Maker, and other digital tools we can use in our work (MP2); GRID is specific, but there are programs like Arasaac (MP11); I know about support products that can help children make music. I know this because, when I worked in the multi-disability unit with CRTIC, my special education colleagues provided support (MP1); technology enables interactions between children that wouldn't otherwise exist (MP6).*	*The answers to this question show that the respondents are unaware of specific technologies for teaching music. However, they are aware of some technologies that can facilitate learning. We highlight the use of software/hardware, and the valorisation and adaptation/creation of unconventional technologies. We find this very interesting because even without adapted musical instruments, teachers manage to be creative and 'get by' by building or adapting AT, non-adapted or non-conventional musical instruments to carry out their lessons. A real example of this is the musical groups Ligados as Máquinas and 5ª Punkada, organised by Professor Paulo Jacob from CPA of Coimbra.*
O3	*The relationship between the teacher and students is extremely important. We must create connections, so the kids feel we're together—it's a unique connection that moves us, hard to explain but powerful (MP2); When I work with someone, I'm working with a person. I'm not working with someone who has trisomy XXI or this or that condition—I'm working with a human being who wants to learn music, and that's how things work (MP7); I like to think: what can this person do, what can't they do, what would they like to do, and what can I do to help them achieve their desire? (MP9).*	*In the answers to this objective, we can see the importance of getting to know the students. They agree on the need to promote access to music for all. However, they emphasise the growing existence of stigmas in society. They therefore feel the need for more training to work with children with SN and warn that much more training is required.*
OBJECTIVES (Table 1)	**SOME EXAMPLES OF ANSWERS**	
O4	*We had a student in the multi-disability room who didn't move much, but she could clap her hands. So, we started working on clapping to accompany songs and music. She was able to join in and enjoyed it (MP1); We had a girl who didn't have an arm, and she wanted to play the bass drum. What's the problem? We tied a drumstick with Velcro to the little arm she had, and that was that. She played very happily with the rest of the band (MP2); I always remember a child with multiple disabilities who didn't speak. With a simple switch, I would record a message every day saying, for example, "Hi colleagues, how are you?" The child would click the switch with her head and trigger the recording. She would arrive in class and press it, and her classmates would wait before responding. The response was excellent—the child was overjoyed and her classmates appreciated her, realizing the importance of this (MP6); Of course, we as teachers have a vital role in inclusion—including them in the class and making sure the class doesn't exclude them (MP13).*	*In response to this objective, the interviewees reported limited experience working with children with CP. However, they reported successful experiences in both participation and inclusion when working with children with NP. It should be noted that the experiences of inclusion reported are fewer than those of participation. This could mean there is greater concern about children's active participation.*
O5	*We have to know that every child is different. We are all different, and our task is to understand what they need and then build whatever is necessary to provide it (MP6); We have*	*As we can see from the answers to this objective, the teachers adapt their teaching to the students, leading us to assume that their teaching is truly*

	to promote activities that stimulate the child's interest, discovery, and enthusiasm—activities adapted to the person (MP8); When people ask what is the best technology to use, I don't answer. I ask: who is the person, what they can do and what they can't, what they would like to do, and what I can do for them. (MP9); I think a teacher's value lies in understanding children's difficulties and preparing things directly for them—a lesson prepared for them (MP12); The focus at school shouldn't be on guaranteeing the teacher's activity, but on guaranteeing the student's activity (MP8); We don't work alone. We have a case management team made up of a Music Technician, Occupational Therapist, Psychologist, Social Worker, Physiotherapist, and Speech Therapist (MP2). What if everyone pooled their knowledge and worked as a real team, sharing it? That's the work that's needed. If everyone worked as a real team, without envy, everyone would gain (MP11); Activity logs—I'm lucky enough to have a record of how they started and how they are now (MP2); A teacher's job is important, but it shouldn't just be to dictate subjects. The teacher should find a way to win the child over so that the child enjoys learning. That's what being a teacher is about for me—getting that child to understand and enjoy learning (MP6).	*differentiated. It is very interesting to see how teachers solve the problems they encounter in their practice. The development of teamwork, the valorisation of records/evidence, and the dissemination of activities are also highly valued. Some MP consider communication, motivation, and opportunities for students to be important. Valuing choice and making the most of students' mistakes, turning them into creative processes.*
O6	*I'm worried that there aren't more people entering this world of music in inclusive contexts (MP7); Let me give you an example: why can't the conservatoire have one or more people with neuromotor disorders learning to play an instrument differently? We're in the 21st century—can't we use technology to facilitate teaching and learning, change perceptions, enrich lives, and equip people with experiences, skills, and content in an innovative way? Why don't we use these resources? (MP7); The first thing we need to consider is self-esteem. Self-esteem is fundamental. The child must believe they can do it—that's halfway to getting over the next hurdle (MP1).*	*These responses tell us about the importance of students' sense of success and developing their self-esteem. We are surprised by the shared perception of "conservative" teaching as too theoretical and lacking the virtuosity that art schools offer. They refer to the need to "break down ghosts" and pay more attention to creativity, curricular ffexibility, and experimentation.*
O7	*The Conservatoire needs to change significantly. Classical, conservative, and retrograde, it doesn't allow for new forms of interpretation and instrument use (MP1); One thing that saddens me is the lack of interaction between conservatoires and mainstream schools, conservatoires and universities (MP14); The school curriculum must change. It must give much more importance to music as an enabler of children's integral development (MP6); There's nothing negative about life. There is only one positive: you're alive! There's a street in Italy where ugly people aren't allowed! And here it's forbidden to walk down the street with a paralyzed person—they can't walk because they lack help. We have to change this mentality (MP5); I think even we at the university should have a subject focusing on music therapy (MP13).*	*These responses highlight the importance of music as an art for individual development and the therapeutic effect it produces through music therapy. There is also a need to review public policies in favour of inclusion, creating real conditions to bring practices closer to the laws already established.*

We can infer that the MP' responses emphasise the following aspects: (i) the lack of training and preparation for MP in working with children with CP; (ii) the need for accessible musical instruments; (iii) the importance and need for teamwork; and (iv) the need to improve public policies. These findings align with recent studies (Alves, 2020; Alves & Fernandes, 2022; Crespo et al., 2018), which reinforce the need to bring together the best pedagogical approaches in music schools to create truly inclusive environments where children with special needs, particularly those with CP, can fully participate and thrive. Integrating diverse pedagogical strategies, both traditional and innovative, is essential to address the varied learning profiles, abilities, and communication needs of these students.

Furthermore, these studies highlight the importance of moving beyond a one-size-fits-all curriculum model toward flexible, student-centered practices that recognize and celebrate individual differences (Minayo, & Costa, 2023; Serafini, 2017; Valério & Schambeck, 2021). This alignment with current research underscores that successful inclusion in AEPM requires not only policy reform but also a fundamental shift in how music educators conceptualize and implement their teaching practices.

This situation requires consistent governmental responses to fulfil the requirements established by the Basic Law of the Education System (Law nº 46/1986). The law defines the education system as "the set of means by which the right to education is realised ... oriented towards favouring the overall development of the personality, social progress and the democratisation of society" (Law nº 46/1986, Art. 1, p. 3067). Among its general principles is the right of all Portuguese citizens to education and culture, "creating conditions to promote school and educational success for all students" (Law nº 46/1986, Art. 7, letter o, p. 3070).

For music learning specifically, this framework is complemented by Decree-Law nº 344/1990, which aims to: (i) stimulate and develop different forms of communication and artistic expression, as well as creative imagination, ensuring balanced sensory, motor, and affective development; (ii) promote knowledge of various artistic languages and provide varied experiences to extend overall training; (iii) educate aesthetic sensitivity and develop critical capacity; (iv) foster individual and group artistic practices to understand their languages, stimulate creativity, and support creative use of free time; and (v) detect specific aptitudes in artistic areas, among other provisions ensuring all children have access to arts education (Cruz, 2014; Decree-Law nº 344/1990; Serafini, 2017).

These principles are reaffirmed today by Decree-Law nº 54/2018 and Decree-Law nº 55/2018, which promote Inclusive Education where "each student, regardless of their personal and social situation, finds answers that enable them to acquire a level of education and training that facilitates their full social inclusion" (Decree-Law nº 54/2018, p. 2918). This approach moves away from categorizing students to intervene (Alves, 2020; Alves & Fernandes, 2022; Crespo et al., 2018; Decree-Law nº 54/2018) and instead emphasizes collecting the best educational practices that make a difference in Portugal's schools, recognizing that our differences make us richer (Crespo et al., 2018).

Finally, the information compiled from these interviews complements our search for good practices in including children with special needs in music education. Understanding the problems music professionals face and the solutions they have developed complements the findings of researchers in the various papers compiled in our literature reviews (Moreno et al., 2022; Moreno & Maia, 2022).

5. Final Considerations

This study aims to document the effective actions, strategies, methodologies, and projects that music professionals have developed to promote inclusion of children with special needs in music education while addressing their needs and interests.

The webQDA software proved an excellent tool for content analysis, simplifying data categorization and enabling us to examine relationships between categories.

The findings reveal strategies used by music professionals. Despite lacking specialized training, they find ways to teach their classes effectively. Some demonstrate creativity by adapting their approach to individual students in practical, resourceful ways. While teachers show an inclusive perspective, they consistently report lacking adequate resources and training.

The creativity of some teachers deserves emphasis—their ability to improvise in class by adapting non-conventional instruments and leading active, participatory classes that facilitate access for all children with SN. Key findings include:

- Teachers lack knowledge of methodologies and strategies for working with children with CP in music education.

- There is insufficient assistive technology to support the communication and participation of children with CP in music learning.

- Adapted instruments are scarce, and teachers have no knowledge of Accessible Digital Musical Instruments (ADMI).

- There is an urgent need for teacher training in this area and changes in educational policies to make Arts Education Programmes of Music truly inclusive.

To address these needs, drawing on knowledge from our previous review work (Moreno & Maia, 2022; Moreno et al., 2022), we developed Teacher Training Workshops and Short-Term Awareness-Raising Actions (Moreno et al., 2023a; Moreno et al., 2023b). These initiatives aim to empower teachers and build an inclusive environment for all children, including those with CP, in AEPM —ensuring that in music learning, no child is left behind.

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Ethical Approval: Ethical approval was obtained from University of Aveiro, the Council of Ethics and Deontology and the General Data Protection Regulation (nº 28-CED/2019 in plenary meeting of July 7, 2021).

Informed Consent: Informed consent was obtained from all participants involved in the study, ensuring respect for confidentiality and voluntariness principles.

Declaration of Conflicts of Interest: The authors declare that there are no conflicts of interest regarding the research, authorship, and/or publication of this article. The material has not been published, in whole or in part, elsewhere and is not currently under consideration for publication in any other journal.

All authors were personally and actively involved in the work that led to this article and take responsibility for its content. All ethical standards regarding the protection of study participants were met, in accordance with the World Medical Association's Declaration of Helsinki.

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