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## Musical bridges to inclusion. The educational journey of an autistic student through composition and music technology

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Elissavet Perakaki

# Musical Bridges to Inclusion

## The Educational Journey of an Autistic Student through Composition and Music Technology

### Introduction

In the quest for equitable learning, inclusive education stands as a beacon of transformation, reflecting the aspiration to provide fair access opportunities to every child, regardless of their individual characteristics and backgrounds (Ainscow et al., 2006). In the inclusive classroom, music technology can serve as a bridge that connects students with disabilities to the broader world of music, ensuring that they can fully experience the joy, benefits, and educational opportunities that music offers. Lately, the development of music technology can offer students with disabilities various tools to participate in music creation and performance, such as specialised software, adaptive instruments, and assistive devices, to participate in music creation and performance (see Hourcade et al., 2013; Hillier et al., 2016; Koichi & Schroeder, 2019; Gall & Backman Bister, in press). At the heart of this inclusion lies the pivotal role of teachers in creating a welcoming and accessible environment, ensuring that pupils and students are not merely present in educational institutions but truly included in the learning process. As Miles (2005) mentioned, “if they do not believe in inclusion, they can become a major barrier to progress” (p. 13).

This research explores the story of a 13-year-old autistic student, nicknamed George (he/his), who embarked on a music journey to enhance his abilities in a general junior high school in Greece. Through interviews with his mother, his classmates, and teachers, as well as diary analysis, the role of music technology, the significance of the students’ collaboration in group composition, the guidance of the music educator, and the benefits of being involved in classroom musical activities are revealed.

## Theoretical Background

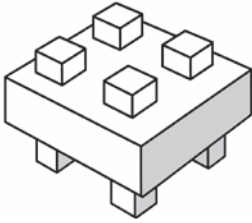
### *The Inclusive Education Framework*

Since the 1990s and the Salamanca's World Conference on Special Needs Education (UNESCO, 1994), the objective of "Education for all" seems to become specific and policy-oriented so as to be fulfilled. Some years later, in UNESCO's (2009) report under the title "Policy Guidelines on Inclusion in Education", the framework became explicit, and the inclusive education definition described it as follows:

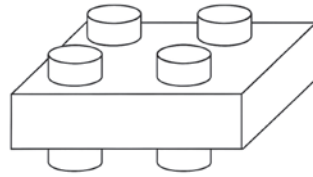
Inclusive education is a process that involves the transformation of schools and other centres of learning to cater for all children – including boys and girls, students from ethnic and linguistic minorities, rural populations, those affected by HIV and AIDS, and those with disabilities and difficulties in learning and to provide learning opportunities for all youth and adults as well. Its aim is to eliminate exclusion that is a consequence of negative attitudes and a lack of response to diversity in race, economic status, social class, ethnicity, language, religion, gender, sexual orientation and ability (p. 4).

Next year, 2010, the United Nations Girls' Education Initiative states that inclusion requires responding to the diversity of needs among all learners by increasing participation in learning, cultures, and communities and reducing exclusion from and within education. It involves changes in content, approaches, structures, and strategies, driven by a common vision that covers all children and the conviction that it is the responsibility of the regular system to educate all of them (UN Girls' Education Initiative, 2010). This initiative goes further than girls' education and underlines the importance of ensuring that all learners who are excluded from education have an equal chance at success. Some countries around the world put in significant efforts to identify and address the specific societal barriers that hinder progress (Laurin-Bowie, 2009). Through these initiatives, learners are given a chance to progress, regardless of their background or circumstances.

The choices and decisions we make in how we structure learning environments in formal settings, such as schools, can have a profound impact on students' experiences and opportunities, setting the tone for the entire learning process and influencing the quality of education that students receive. Parreño and Sánchez-Dopico (2011, pp. 33 & 34) use geometrical shapes to describe a classroom according to its pupils' and students' abilities and disabilities. The following set of figures offers a visual exploration of distinct educational approaches, highlighting the contrasting philosophies of special and mainstream education (Fig. 1 & 2), integration, and inclusion (Fig. 3 & 4). In special and mainstream education, the members must have the same characteristics, and their shapes correspond to its system framework.

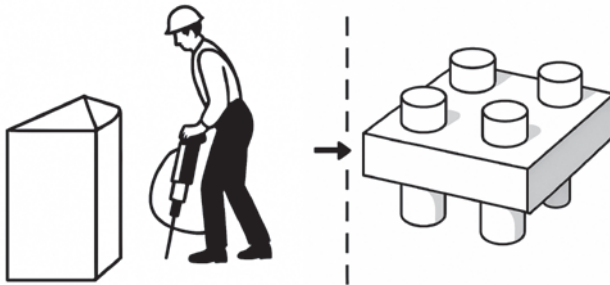


**Fig. 1:** Special Education (Parreño & Sánchez-Dopico, 2011, pp. 33 & 34)



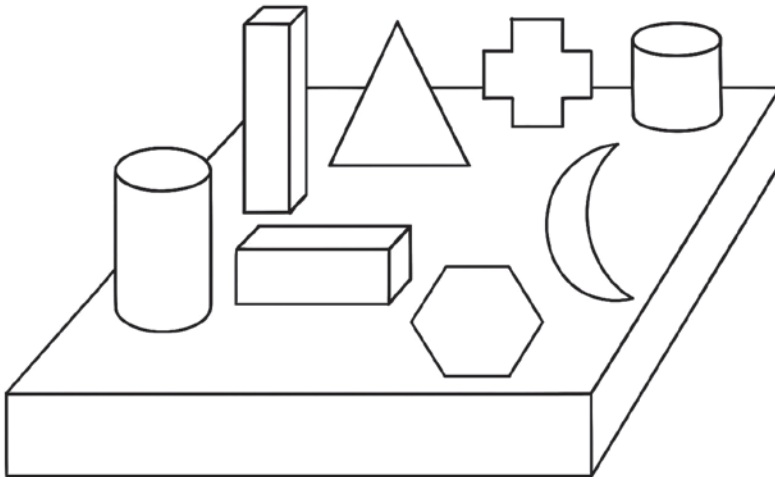
**Fig. 2:** Mainstream Education (Parreño & Sánchez-Dopico, 2011, pp. 33 & 34)

Moreover, as the integration process progresses, individuals who are unable to find a compatible partner are put through a transformative system. This system modifies their physical and mental attributes to increase the likelihood of a successful match in the future. As a result, the transformation compels them to adapt, either as a group or individually, or else risk facing failure (Parreño & Sánchez-Dopico, 2011). In this framework, students strive to fit into an inappropriate setting for them while the teacher attempts to mould their learning and thinking approaches.



**Fig. 3:** Integration (Parreño & Sánchez-Dopico, 2011, pp. 33 & 34)

On the other hand, in an educational setting that values inclusivity, all individuals, regardless of their differences, are welcomed and provided with opportunities to learn, grow, and participate (Howgego et al., 2014). Because of this variety of abilities and disabilities, an environment is built where values, attitudes, policies, and practices within a school setting change (Polat & Kinsanji, 2009). Fig. 4 depicts a wide range of shapes, with each shape symbolising a unique way of learning. It provides a visual representation of the diverse techniques and methods that can be utilised by students to acquire knowledge and enhance one's education.



**Fig. 4:** Inclusion (Parreño & Sánchez-Dopico, 2011, pp. 33 & 34)

Taking into consideration that school is a small community that constantly learns, people with different physical, emotional, and educational needs are or should be involved with the same rights and obligations. Miles and Singal (2010) underline a school’s aim, which is “to promote democratic principles and a set of values and beliefs relating to equality and social justice so that all children can participate in teaching and learning” (p. 11). Within this community, every member is embraced and has a unique place where the education concept goes further and fosters the above issues (Miles & Singal, 2010).

The role of educational choices in shaping students’ experiences emphasises the contrast between traditional approaches and inclusive philosophies. The process of integration, especially in educational or workplace settings, can be quite daunting for individuals who do not fit into the standard mould. This can be particularly difficult for those with autism, who may have unique learning styles that are not always accommodated within traditional systems. The transformative journey of integration can pose significant challenges for these individuals, as they may require additional support and resources to help them navigate this process effectively. The inclusive approach in a general school context aligns with the principles of equal rights and obligations for all, offering a supportive environment for every student with an additional need or a disability.

***Fundamental Features of Autism***

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition involving persistent challenges with social communication, restricted interests, and repetitive behaviour (APA, 2023). It is characterised by a range or “spectrum” of symptoms, which can vary in severity and presentation. Some of the conditions included under the umbrella term of ASD are autism, Asperger’s syndrome, and classic autism (UNESCO, 2009).

Due to the fact that autism is a spectrum disorder, each person with autism has a distinct set of strengths and challenges. How people with autism learn, think, and problem-solve can range from highly skilled to severely challenged. Therefore, it's essential to understand that autism is not a one-size-fits-all condition and that each person with autism has a distinct set of strengths and difficulties. The American Psychiatric Association (APA) describes some characteristics of an autistic person, referring to social communication and behaviours in the following table:

<b>Social communication (selected)</b>	<b>Behaviours (selected)</b>
Decreased sharing of interests with others	The inflexibility of behaviour, extreme difficulty coping with change
Difficulty appreciating their own & others' emotions	Expecting others to be equally interested in those subjects
Aversion to maintaining eye contact	Difficulty tolerating changes in routine and new experiences
Lack of proficiency with the use of non-verbal gestures	Sensory hypersensitivity, e. g., aversion to loud noises
Interpreting abstract ideas literally	Stereotypical movements such as hand flapping, rocking, spinning
Difficulty making friends or keeping them	Arranging things, often toys, in a very particular manner

**Table 1:** General features of an autistic person concerning social communication, and behaviours (APA, 2023)

Focusing on music practice, which takes place in mainstream classrooms, individuals with autism may experience challenges in controlling motor skills, maintaining a consistent rhythm, playing a musical instrument with precision, expressing emotions, sharing ideas, and communicating with others. As autism is a spectrum, all the above features are unique for each one. Meanwhile, the noise level in a music classroom can cause discomfort and nervousness, leading some individuals to express their negative feelings in a harsh manner. When providing support to someone, in this case to autistic students, it is crucial to understand their unique requirements and preferences. This requires flexibility and a person-centred approach, where the autistic or other person's specific needs are taken into consideration. By doing so, we can ensure that the support being provided is tailored to the unique requirements, which can lead to better outcomes and a more positive experience for everyone involved.

### ***Music Technology and the Inclusion of Students with Disabilities***

The use of music technology has revolutionised the way we approach music education and has provided a platform for students with disabilities to unleash their creativity and showcase their musical potential (Gall et al., 2018). It can offer them various tools and devices to meet their unique needs to participate in music creation and performance, opening up new avenues for them to explore and express themselves musically (Gall et al., 2018). These assistive technologies are rapidly increasing and help to level the playing field, making music education more inclusive and accessible to everyone, regardless of their physical and cognitive abilities (Hillier et al., 2016; Samuels & Schroeder, 2019) or previous music knowledge (Alper, 2019).

At the same time, the development of touchscreen devices has been great since 2010, when iPads first appeared (Kucirkova, 2014). These portable and lightweight devices do not need certain levels of dexterity, e.g., a mouse or keyboard, and can accommodate several applications. The simplicity of touch interaction has reduced the obstacles to using them, making them more accessible to people (Hourcade et al., 2013). In these conditions, they provide “unprecedented opportunities for children to create their own content and participate in rich and dynamic learning contexts” (Kucirkova, 2014, p. 1).

Taking for granted that touchscreen devices are now an integral part of daily life, from smartphones to laptops, music teachers can use them to create a more inclusive and equitable classroom environment. This particularly advantageous combination urges individuals with ASDs to participate in music lessons, as most of them show “an inherent interest in both music and technology” (Hillier et al., 2016, p. 276). Consequently, all these music technologies enable students with ASDs and other disabilities to overcome physical and cognitive challenges, improvise, compose, and express themselves in ways that might have otherwise been difficult or impossible.

### ***The Inclusion in the Greek Educational System***

The Education for All Global Monitoring Report of 2005 emphasises that learning should be tailored to individual characteristics and backgrounds. Therefore, teachers play a crucial role in creating a welcoming and accessible environment for pupils and students to learn and be included in education. As differentiated instruction is closely associated with inclusion (Edge, 2018), when teachers possess knowledge of these students’ unique learning needs and styles, they can tailor their approach to teaching accordingly. By doing so, there are more possibilities to provide “effective support that caters to the individual needs of each student” (Edge, 2018, p. 45).

Since 2008, the Greek educational system has implemented inclusive education by integrating students with special needs and learning difficulties into mainstream classrooms. Specialists in educational-need-student teachers have been employed to aid in this effort. One teacher is assigned to each student for specific subjects such as Mathematics,

Physics, and Modern and Ancient Greek Language. These teachers collaborate with their colleagues to encourage student participation in learning. However, as students are not supported in all faculties, teachers, including music teachers, either need to be trained and feel confident to support students with special needs and learning difficulties, or they need more materials, methods, and support for reflection (Burnard et al., 2008) or both.

Music lessons in Greece are mandatory for all in primary and secondary schools. Pupils and students attend a 45-minute weekly music lesson taught by an expert music educator. The updated Music Curriculum in Greece (2021) aims to facilitate students' personal growth and establishes a lasting connection with music as an art form. It is based on three pillars: music appreciation, performance, and composition, and it incorporates teaching approaches such as STEAM (Science, Technology, Engineering, Arts, and Mathematics), experiential learning, and differentiated instruction. It is open, flexible, and designed to empower all students to develop their musical potential and creativity. Under these conditions, students with special needs feel welcome and valued in the music classroom. Music technology plays an integral role in it, as it can be a powerful tool for music educators to assist students in overcoming challenges in musical activities and showcase their progress in unique ways (McCord, 2002; Martinho et al., 2018).

## Research Methodology

The study delves into a 4-month story and explores the experience of a 13-year-old student with autism nicknamed George (he/his), who participated in a mainstream music classroom in a junior high school in Greece and joined a group to enhance his musical abilities. Its main aim is to understand how music education, particularly through technology and a supportive group structure, can benefit him, enhancing his musical abilities and fostering social connections and self-expression.

The present study utilises a narrative inquiry approach by conducting semi-structured interviews with the language specialist teacher, the music teacher, and George's mother. In addition, the music teacher's diary analyses, participatory observation, and informal discussions with George's classmates are employed to gain a more profound understanding of George's feelings and behaviours. Collected data is analysed following the basic elements of thematic analysis: codes, categories, patterns, and themes (Creswell, 2007). All interviews are scripted, and then their content and that of the music teacher's diary are categorised as follows: a) George's interaction with technology, b) his behaviour and dispositions during music lessons, c) the expression of his feelings in different lesson parts, d) his interactions with his classmates, and e) his classmates' reactions to his autistic characteristics.

To ensure the anonymity of the research participants, all names are replaced with nicknames. Furthermore, the genders and sexes of the research participants are not disclosed, except for George's, because "boys are more likely to be identified as having SEN [Special Education Needs] than girls" (Peters, 2007, p. 124) and there are notable differences between boys' and girls' brains who are on the autism spectrum (Supekar et al., 2022).

### *My Name is George*

George is a 13-year-old boy who belongs to autism spectrum disorder. He studies in the first class of a general junior high school in an urban area. He adapted well, as he had many classmates from primary school who were already known. He is a high-skill autistic student, and his language-specialised teacher, S.T. (they/their), describes him as a student who tends to keep to himself and struggles with socialising. He often avoids making eye contact and initiating conversations. He attends the music class, but his participation is minimal. Additionally, he seems obsessed with his pens, bottle of water, and tissues. During the class, he sits alone at his desk, keeping his routine, which involves encompassing textbooks, pens, a bottle of water, and numerous handkerchiefs.

Every day during school lessons, S.T. spends three hours helping him and describes him as:

a calm and cooperative student who is quite organised and tries to follow the social rules correctly. He does not have many friends at school and shows difficulties in social interaction. He participates in the classes and is almost always properly prepared and read. Sometimes, he is absorbed by some of his thoughts. He does not maintain eye contact and hesitates to greet or open a conversation. His movements are slow, especially when he is walking and packing his bag (he was always the last to leave the class). He expresses a strong need to ask questions constantly, being opinionated and impatient.

(Semi-structured interview at the beginning of the research)

### *George's Behaviour and Dispositions during the Music Lessons*

Before the first music lesson, his music teacher, M.T. (they, their), had discussed with S.T. his advantages and challenges in trying to create an inclusive classroom environment. M.T. describes his musical behaviours as follows:

During the music lessons, he faced difficulties in clapping his hands and percussion on the beat. He preferred staying alone with bare participation in the lesson. He sang sometimes and preferred music that could recognise the characteristics of video game music and songs. The sounds of instruments and the classroom noise made him nervous, but he could handle this feeling.

(semi-structured interview with M. T. at the research beginning)

M.T. tried encouraging him to participate more in music activities in various ways, such as singing, listening, and performing. A few weeks later, M.T. organised improvisation and composition activities using an iPad tablet in the classroom. During the lessons, M.T. noticed that he had become more eager and enthusiastic, started expressing more interest, and actively engaged in the activities that he had to do with music platforms on the tablet. M.T. was surprised by the sudden change in his disposition and shared their observation with George's mother.

I strongly believe that it is essential for teachers, especially music teachers, to interact with parents or caregivers not only when dealing with misbehaviours but also when students achieve their personal goals. By doing so, teachers can strengthen the relationship between the school, the student, and their families. This knowledge can motivate them to encourage their kids to participate in musical activities outside of school.

(Music teacher's diary, 2 months after the research began)

It came as no surprise to his mother that George possessed such skills, as she was already aware of his abilities, but she had never mentioned them before in the school community, as she thought that it would not be such beneficial information. During the discussion with the mother, M.T. was surprised by George's capabilities and preferences:

I have never heard before that he enjoys playing video games and prefers listening to music and songs from them! I wish I knew that he also fixes various electronic devices and helps with problems on digital platforms at home. I could have already boosted these capabilities during the lessons, and he might participate actively rather than be pathetic. I wonder but I understand why the whole family tries encouraging him to participate in various other topics, apart from technology, but without positive results. They need guidance from a specialist in ASD!

(M. T.'s diary).

Upon observing George's interests, the music teacher went out of their way to seek and provide him with activities that would cater to his passions, focusing on George's interests, to support his personal growth and development. But what about the rest of the classmates, who also need the teacher's attention? M.T. expressed these conflicted feelings:

I faced a dilemma, as I had to decide between two equally important and conflicting choices. On the one hand, I wanted to inspire George to participate in the lessons with the use of technology, but on the other, I didn't want to overlook the interests of the other students in the class.

(M. T.'s diary)

M.T. carefully considered the diverse mix of students in the classroom and made the decision to introduce music technology as a new element in their music lessons. They were curious to see how George and the rest of the students would respond to this approach while introducing digital musical instruments and then platforms, such as GarageBand.

By embracing this technology, M.T. hoped to provide a more engaging and dynamic learning experience, fostering their creativity and musical abilities. The whole class was excited. George was excited, too, and he became more motivated and engaged as he was intensely interested in technology. Then, he decided to download GarageBand onto his own tablet, and music experimentation began in his free time outside the school. Some days afterward, he asked to present one of his compositions in the classroom. His creation impressed his classmates.



Fig. 5: Screenshot from desktop during George’s presentation

Although his effort was in the beginning of experimentation, for the first time, his classmates focused on his capabilities rather than his disabilities. M.T. wrote down some of the class’s reactions:

He does not look at us when we talk to him! He looks elsewhere! How could he use a tablet in such a successful way? I am impressed! (D., George’s classmate)

He looks to be interested only in his bottle of water and tissues. I had no idea that he could compose music! Y., George’s classmate)

M.T. was very proud of their classmates and realised that the students needed time to understand the characteristics of people with ASD, and read between the lines, trying to focus on what he could do and not on what he could not. In these new conditions, M.T. decided to plan group music activities to encourage George’s socialisation. Some lessons later, M.T. wrote:

Music technology changed George's disposition against the music lessons. He shows more interest now. I tried to help him to encourage his communication with other classmates. In the beginning and during the group activities, I sat beside him to motivate him. I simplified the activity so as not to feel disappointed. Another classmate who sat alone as well wanted to take my role and asked me:

- “Could I make a group with George?”
- “If he wants, why not?”

He agreed, and for the first time, he communicated actively with a partner. Sometimes, I was the third partner to gradually increase the number of group members. (M. T. diary)

Some weeks later, M.T. planned a composition activity on a digital platform (GarageBand). Students were provided with a rhythm ostinato with the word “Music” (*Μουσική* in Greek). Then they had to compose a melody over it with Boomwhackers or glockenspiels and then orchestrate it with a selection from the platform's digital instruments or samples. George became a member of a small group (3 students in total). Together, they composed a melody for Boomwhackers, and two students performed it, as George found difficulties playing on the beat. He only cooperated in brainstorming with the other members and shared some of his ideas. After a short discussion about the form of composition, George was responsible for the recording and the digital orchestration. The other members of the group reflected on it, and the outcome of their collaboration can be seen in Fig. 6.



Fig. 6: Screenshot from George's group composition

His music teacher explained:

Through this activity and with the use of technology, a field that he was interested in, he managed to be part of a small group, participate equally, and broaden his musical horizons. One member of his group admitted that George had inspired ideas and made decisions very quickly. During this process, he remained completely focused on his tablet, and nothing else could distract him.

(M. T. diary at the end of the research)

Some weeks later, his mother informed us that George continued experimenting with GarageBand and creating his own compositions. When he wanted, he asked M. T. to share them with the rest of his classmates and get some feedback (data from the semi-structured interview with M.T. at the end of the research).

## Discussion

The research findings shed light on the transformative impact of involving students with challenges in musical activities within an inclusive environment, as exemplified by George's story. The study highlights the pivotal role played by music educators in guiding students and creating an atmosphere that fosters inclusivity. The exploration of music teachers' diaries underscores the time and effort required to identify effective strategies for communication and inclusion of individuals with special needs. A noteworthy outcome emerged as George actively engaged in a digital composition activity, showcasing his capabilities and the potential of music technology as a bridge to his connection with his classmates and the broader world of music.

As Burnard and her colleagues (2008) mention, "the potential of music is to serve as a unifying force" (p. 110). George's story describes this force and the many advantages of involving students with challenges in musical activities by creating an inclusive environment and the guidance provided by the music educator. Bell (2008) underlines that individual support for special needs can be challenging, especially until finding suitable activities. George's music teacher's discussion with the language specialist teacher proved to be essential, as this teacher was well informed about his characteristics and, as Cohen and his colleagues (2010) note was "better equipped to prevent interference with the learning process for both those children and their classmates" (p. 6).

According to the music teacher's diaries, the music teacher and students required time to identify effective ways to include and communicate with individuals with special needs. Firstly, music teachers, and then students, should focus on capabilities to facilitate a "versatile and positive learning experience and avoid the emphasis on 'deficits' [so consequently], new positive learning will result" (Flem et al., 2004, p. 96). It is important to highlight that the sense of belonging in students with disabilities, such as ASD, should not

be taken for granted. That is the main reason why students also need time to find ways of communicating. As Giangreco and his colleagues (1994) and Hornby (2012) state, inclusion is not solely based on physical location but rather on the feeling of being accepted and welcomed in a community on a daily basis.

With the encouragement of his music teacher, George actively participated in a digital composition activity that allowed him to showcase his capabilities and preferences. Despite having difficulty keeping a steady beat, he focused on activities he could do and was interested in working on them. Darrow (2015) asserts that music educators rarely encounter instructional efforts that cater to the needs of every student. However, the child-centred, participatory, and active teaching approaches, which the music teacher implemented, seem to be essential for inclusivity, shed light on the whole music classroom members' needs, and benefit all children. Draper's research (2022) underlines the fundamental role of the educator and the close community in the impact of ASD students' experiences.

In the inclusive classroom, music technology serves as a bridge that connects students with disabilities to the broader world of music, ensuring that they can fully experience the joy, benefits, and education opportunities that music offers through "meaningful participation for all students in music" (Nelson, 2013, p. 26). The cooperation between the music teacher and George's mother played a catalyst role in knowing his special interests and experiences and trying to adjust the teaching tools to them. As Sung (2010) states, "experiences connected to the learner's present knowledge and interests are learned best" (p. 55). Within this context, music technology can also be a valuable tool for music educators to assist students in overcoming challenges in musical activities and showcasing their achievements in ways that may not be possible through other methods (Martinho et al., 2018).

Music teachers should be skilled at utilising the power of music and music technology to cultivate an inclusive environment that encourages participation and contribution from everyone. Their ability to tap into music's force and bring people together is remarkable. They should possess a deep understanding of how to create a safe and welcoming space where all students feel valued and supported to express themselves through experimentation and composition. The guidance and expertise that music teachers offer enable students to discover the joy of music and develop their skills while fostering a sense of community and belonging (Giangreco et al., 1994). In order to create an inclusive music education environment, and as technology continues to evolve rapidly, it is essential for music educators to remain up to date with the latest advancements in music technology. By adapting and incorporating new technologies into their curriculum, they can ensure that all students have access to the most innovative and effective teaching methods so that children and young people with disabilities can experience the pleasure of music-making (Backman Bister & Gall, in press).

In conclusion, it is important to take into consideration that inclusive education is a continuous journey, not a fixed destination or a goal with a specific timeline, which can act “as a catalyst for change in educational practice, leading to improved quality of education” (UNESCO, 2005, p. 12). Miles (2005) underlines that “understanding inclusion as a process enables us to move beyond arguments ‘for’ or ‘against’ inclusive education. Instead, the issue is about working together to promote progress” (p. 7). As Burnard’s (2008) research suggested:

inclusive pedagogies appear to have the potential to re-engage learners – by developing learning terrains that build democratic relationships in and out of the classroom, where disengaged students may enjoy the respect and recognition of their peers and, most importantly, reframe the roles of teachers (p. 72).

Integrating adaptive music technologies into standard curricula can enhance the inclusivity of music programs. Additionally, it is important for educational institutions to establish policies and initiatives that recognise and endorse the significance of inclusive music education. The role of music educators is fundamental, as they must be encouraged to perceive the significance of inclusivity and the impact it can have on their students. They need to be mindful of the unique needs, backgrounds, and abilities of each student and tailor their teaching practices accordingly. To achieve this, they may need to change their mindset and be open to new ideas and approaches.

Further research on this topic concerning curricula and music teachers’ professional development would ensure that students of all abilities have equal opportunities to explore and express themselves through the transformative medium of music.

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