

In some ways music can be thought of as the ultimate interdisciplinary subject, but it is also highly specialised in other respects. Examine this paradox in the context of the debate about music's role in primary and secondary education.

Music's role in education is extremely difficult to define. Although technically classed as an 'Arts' subject, there are qualities found in the teaching of music that lend themselves to various academic pursuits - it is most certainly an interdisciplinary subject. In fact, music can be tied to STEM or Language subjects in more ways than you would originally think, while also being a completely removed, unique and specialised subject. Despite the seemingly complex and paradoxical nature of music, its role in both primary and secondary education is becoming increasingly important as we start to learn the benefits that studying music, in any form, can bring to students, especially those with young and developing minds.

So why is interdisciplinary education so important within both primary and secondary education? And why is music such a perfect example of an interdisciplinary subject? First of all, it has been proven through various research and experiments that teaching Art subjects in schools does have an obvious impact on students' ability to learn and produce good results in standardised tests. Recent studies have shown a connection between music and increased scores in general IQ, and in these cases it is the rhythmic aspects that are shown to have the greatest improvement. (Department for culture, media and sport, n.d.) In fact, it has been argued that 'multi-subject' students are able to perform increasingly well academically as they are able to take knowledge from one subject area and apply it to another. Additionally, it teaches students to think critically about their subjects and consider multiple perspectives - finding areas where there is convergence as well as areas which might seem to contradict. (Weller & Appleby, 2021) The effects of interdisciplinary education are clear, promoting a new way of teaching that many schools across the world are beginning to take interest in and, eventually, use within their own curriculum. Greece, for example, made official changes to its education system in 2001; a new curriculum was put in place, going by the name 'Interdisciplinary Unified Curriculum Framework'. Its aim was to stress the importance of interdisciplinary approaches to teaching and learning - creating an environment in which "internal cohesion" and "unified development of contents" is achieved. Contents for each level of education included proposals for connections between music and other subjects in particular. (Chrysostomou, 2004) In many cases such as this, music is the first choice. There are many reasons why this subject is considered the "ultimate interdisciplinary subject".

Music seems to be of value in strengthening an enormous variety of subjects and skills - some of which include mathematics, reading and language, memory retention, sensory education, and lengthening of attention span. (Omniewski and Habursky, 1999) In particular, research has shown a direct link between music and improved readability in children. (Department for culture, media and sport, n.d.) Such 'creativity' links are fairly obvious and understood, and yet similar links to scientific subjects are understated and explored much less. There is ample evidence that these connections between music and science - or STEM - subjects do exist, however, and although links are perhaps more 'specialised' and precise, they are no less significant than that of the literature counterpart. A connection between music, physics and mathematics would refer to music as "the combination of simple sounds in an orderly sequence, complying with certain rules, which correspond to the rules of logic

in mathematics and to the laws of nature in physics”, for example. (Turna & Bolat, 2016) Additionally, the constant examination of sound from all aspects of music most definitely fall into the domain of physics - to illustrate, the composition of a microphone and the way sound is amplified could be taught in both physics and music, allowing for a deeper understanding and connection between the subjects. In this context, the disciplines of physics and music are intricately intertwined. Additionally, basic maths is required to make sense of time signatures and note lengths, and although this may seem tenuous to an experienced adult, for example, these low-skilled connections have an incredible influence on a young child. As many primary school teachers or parents are aware, children require constant recapping of previously learned knowledge while still finding themselves engaged and inspired. Referring to music when learning fundamental skills like this are key to ensuring the best education for young children. This same process can be applied to any and all subjects, heavily proving music’s interdisciplinary potential.

Conversely, there are arguments that music should be, and is, considered an autonomous subject. Perhaps, promoting an interdisciplinary way of teaching detracts from music’s unique qualities and reduces this important subject to nothing more than a “bridge” between other, more ‘important’ (as is implied) academic pathways. Such arguments do carry some truth, and pose the question: is the interdisciplinary approach really beneficial to students of both primary and secondary education? Or, in the process of blurring the lines between disciplines, are we also overlooking the significance of each subject as its own entity? In fact, although the interdisciplinary approach is highly praised across the world, there is an always-present debate as to whether this way of teaching truly brings more benefits than problems. Some say there is not yet enough proven and unarguable evidence to assure the complete superiority of interdisciplinary studies over the regular, traditional methods - and it is therefore impossible to determine the overall efficiency of this curriculum. (Chrysostomou, 2004)

Similarly, some argue that not all subjects can be interrelated. Connections should be meaningful and beneficial, and the impracticality of this leaves no doubt that such pathways between subjects are hard for teachers to achieve, particularly in cases where the linking subject is one that the teacher themselves does not fully understand. (Chrysostomou, 2004) In reference to music, this idea proves the paradoxical nature of the subject - that is, that music is highly specialised and autonomous. In no way would a maths teacher, for example, be expected to know the intricacies of music education. Hence, interdisciplinary approaches should be reconsidered as beneficial for students. There is an underlying concern that students could be taught incorrect information which could impact greatly on their overall performance.

There is no doubt that parts of this argument are true; music is most definitely highly-specialised, especially in the transition from secondary to higher education. Just as a student who has never studied mathematics cannot be expected to solve an algebraic equation, a student who has never studied music cannot be expected to write an essay on the unique timbres used in a particular piece of programmatic music. Each subject has its unique methods, jargon and attributes, and music is in no way inferior in this regard. For example, playing the demanding two three-second segments of the 11th variation from the 6th Paganini Etude by Franz Liszt, for example, requires the production of 30 notes per second. A tremendous amount of training is needed to achieve this level of performance. In

most cases, professional musicians can practise for up to 7,500 hours before the young age of 18. (Cabeza, 2009) Thus, some forms of music take a huge amount of skill, mastery and time to perfect. This is clear evidence that pursuit of music to such a specialised level is possible, yet it is somewhat unheard of within a lower school setting. If a student wishes to truly learn music, a low level of attention to the subject will not do. It can not be learned to its full potential when treated as a 'bridging' interdisciplinary subject. Because of this, there should be an increased emphasis on music within primary and secondary education; it is a highly valuable subject and presents as many opportunities in life as any other core subject. It should not be pushed aside and labelled with the sole purpose of enabling interdisciplinary teaching - music is so much more than that.

The logical conclusion after considering both sides of the argument is that a balance needs to be found between interdisciplinary learning and stressed focus on separate subjects when considering music. Music is neither the perfect interdisciplinary subject, nor is it completely unique and specialised - such paradoxical nature is actually beneficial to the education system if exploited to its full potential. A clear presence of music should be strived for within both primary and secondary education in order to fully reap its benefits; the young mind is still developing, and learning to think critically and consider multiple different perspectives is a key step in growing the academic potential of individuals. Skills learned through this way of teaching, such as the ability to make connections and learn to a deeper level of understanding, are transferable to later life and are also valuable in the development of the mind outside of an academic situation. These ideas should most certainly be explored through interdisciplinary teaching in all young students, both in primary and secondary education. Furthermore, students should be allowed the choice of music as a complimentary subject, or music as a core subject. In such a way, one subject can be catered towards a range of students with varying interests towards music, while still helping increase their academic potential. By using this adaptive way of teaching music, every individual will experience the benefits of such an academically significant subject as music. No matter how it is approached, music is, by no doubt, incredibly important within primary and secondary education.

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