

Introduction

The words Music Technology (MT) encompass many different disciplines. It is fundamentally the use of any device, mechanism, machine or tool by a musician or composer to make or perform music; to compose, notate, play back or record songs or pieces; or to analyze or edit music. Through the ages acoustic musical instruments have evolved and been created to produce different sounds, often imagined in the mind of a composer.

Since the 1960's sounds have also been created electronically and computers are now used to store, playback and manipulate sounds in composition and live performance.

In this discussion document we use MT to refer to the creation of music and sound using computers to compose, arrange, record and produce music of all genres. This includes composition and songwriting, music production, turntablism, DJing, music technology in therapy and all aspects of Special Educational Needs and Disability.

Pioneers are using compositional and music production techniques to give disadvantaged young people and adults meaning and joy in their lives.

Many people are aware of the danger of losing structured music curricula and music making in schools. Examples of artists such as Dizzie Rascal, have shown how important music is not only to learning but wellbeing at all stages of life. He is a good example of someone succeeding at school through music.

For children and young adults to go through their whole educational experience without music being on the curriculum or in some way integrated into school and education, would be not only a great shame but of great detriment to the future of our society and culture.

We are currently on the cusp of "No music in schools" becoming a rapid reality, especially when funding problems encourage the notion that music and the arts are a luxury that cannot be afforded.

This document sets out to show that properly structured Music Technology curricula can alleviate funding challenges and ensure that music making is not totally lost in the education of future generations.

STEMs

Music Technology and Production is an ideal vehicle for teaching STEM subjects.

Science: Physics, Acoustics, Magnetism, Electromagnetic Force.....

Technology: IT, software, coding, interfaces, formats.....

Engineering: Hardware design, digital storage design and maintenance, planning.....

Mathematics: Acoustics, music intervals, pitch and timing.....

Why would Music Technology be a beneficial subject to have in schools?

The processes used in MT involve:

- Literacy, numeracy and mathematics, history, poetry, DJing
- IT skills, music and creativity, critical thinking, music production
- Communication and social skills, personal development
- Copyright and awareness of law, business skills and enterprise

In fact MT could be used as a creative and integrated base for teaching much of the curriculum. Using the IT aspects of MT, could enable many schools to retain Music as part of the curriculum where it is under great threat.

Most Middle and Secondary Schools will have computer suites and adding MT to those suites would be easy and cost-effective. MT has proven to be an extremely useful tool in engaging students with special education needs and disabilities (SEND). MT has the potential to offer inclusive access to every student in education.

Given that MT implementation does not need to be expensive, there is huge potential to create cultural opportunities in deprived areas.

Would Music Technology education appeal to the new technology minded generation? If so why?

MT would excite the curious mind of the new generation. Using MT in game design, film subjects and other media subjects, which may exist on High School curriculum, would be engaging for students. Songwriting and composing lend themselves as excellent vehicles to teach English Language, Literature and Poetry.

The excellent work of FutureDJs <https://futuredjs.org> has shown how adventures with DJing and MCing can stimulate a new interest in Music amongst students and create an enthusiasm for other subjects.

Music is an excellent way to make the subjects mentioned above, including Science subjects, creatively interesting. This applies to all the arts of course, but many areas of music also lend themselves to research and guided enquiry, both technologically and artistically.

The creative use of sound shaping and MT can stimulate an interest in:

- Composition and orchestration
- Performance and arranging
- Songwriting
- Acoustic principles and Electronic engineering
- Physics, the environment and mathematics
- Systems thinking and integration
- Music for healing and wellbeing
- Biology, hearing and cell structures

Would School music teachers from all levels of experience, benefit from being trained in Music Technology?

There has been a great lack of good relevant training for teachers in MT many of whom have been unwilling to explore the potential of reframing an outdated music curriculum. Indeed archaism may be forced upon them.

Many music teachers are afraid of technology and are overstretched anyway, so any training has to encompass procedures that make it highly creative and fun. School Music teachers would therefore benefit from MT training.

Of course, funding is always a challenge but the development of inspired MT curricula can be seen as an investment rather than a cost, which will stimulate savings whilst being of enormous educational benefit across all curricula.

Careers Advice

Well-informed advice about career potentials in the Music Industries is in short supply. Where this is given by teachers and careers officers, it is essential that they are prepared with proper training, as there are many career paths in the Music and Media Industries outside of being a "Pop Idol".

It is also vital that clear career paths are identified in qualifications and learning at all levels.

Overall what is the current state of music education? Do we think the traditional method of teaching music is outdated? Are there enough opportunities for young musicians and sound engineers at school?

There have been big holes in traditional music education for a long time, but there are also excellent aspects of it that must be retained.

It is vital that instrumental playing and instrumental teaching is encouraged and there is ample evidence of the benefits of all types of music making. This is backed up by research in neuroscience, Social and Emotional Learning and focus on the wellbeing of teachers as well as learners.

Wellbeing is an investment in itself and results in savings in staff retention, reduced absence and resilience to rapid change. Music and MT are vital paths towards this.

MT curricula, properly structured, can also be used to create excitement and awareness of musical genres often not explored by some young people. The creative use of media and IT can enhance studies in social awareness, social history, diversity and gender balance.

Stagecraft, business skills, rights issues (an awareness of law) are also areas that provide not only cross curricular opportunities but the enhanced development of life skills. Music Production techniques also allow for planning, choice making, discernment, resilience and critical thinking.

Producer and Educator Sam Nichols from Leeds Beckett University observed:
"Where there are barriers to the take-up and performance of traditional music instruments, music technology becomes a vital and affordable alternative avenue to explore the creation, exploration and manipulation of music and sound".

Newly developed software and controllers from, for example, Ableton, Steinberg and Native Instruments allow sound performance to be replicated and at the same time can be used for learning in Composition, Arrangement, Digital Management and Group work.

Manufacturers can be commended for considering the potential of MT Technology Education in their development strategies.

The pioneering awarding body RSL (Rockschool) now offer a series of 8 graded exams in Music Production that range in ability for Key Stage 3 upwards. These also attract UCAS points from Grade 6. These exams also create employment opportunities for peripatetic MT teachers.

Diversity considerations

It is vital in any considered structure, that a balance of gender, race and LGTB is incorporated into the system. This can be achieved through the careful balancing of those chosen to be trained as peripatetic teachers, for example.

This could dispel the outdated notion that only boys are interested in technology and sciences, as an example, as well as the lack of music education in deprived areas.

Across the Music and MT spectrum there are many examples of good practice that need to be encouraged and integrated, such as the Leicestershire Music Education Hub,

There are also great opportunities for MT to be used in the areas of Learning and Profound Learning Difficulties and many aspects of SEN/D.

Opportunities for collaboration across disciplines.

The Creative Industries thrive on collaboration between different creative disciplines. As technologies converge in the digital world, great opportunities exist for learner collaboration that reflects good industry practice. Music and Sound with Film, TV and Media studies are an obvious example that can be explored at all educational levels.

Employment opportunities

There is great potential for young people to teach MT in schools as peripatetic teachers and permanent staff. Structured training is vital. These peripatetic teachers can then share services between several centres.

Service and maintenance are also vital areas that can be included in a peripatetic scheme. This will relieve teachers of the stress created by systems breaking down.

Structured curricula that are relevant and appropriate need the backing of both industry and government. Awarding Bodies need re-assurance that qualifications will be taken up and will be financially viable for them to invest in.

Awareness training of the potential and application of MT will be essential so that informed decisions can be made.

Teachers and careers officers must be made aware of the myriad work opportunities in music, outside of commercial music production. It is vital that opportunities in the Classical and Orchestral fields are not excluded, where subjects like AV recordings of live performance enable students to see and experience the technical aspects of performance, stagecraft and the world of sound.

There are admirable examples of interactive apps introducing the orchestra and stimulating interest in classical music.

Conclusion

We are in danger of losing a grasp of music in schools and how important music can be to learning at all stages of life. For children and young adults to go through their whole educational experience without music being on the curriculum, or in some way integrated into school and education, would be a great shame. Unfortunately we are on the cusp of this becoming a reality.

MT is a great tool for ensuring that learners are exposed to practical music making and all the academic advantages that this brings.

A creative MT curricular can encompass:

- Social and Emotional Learning
- Guided Enquiry
- Blended Learning
- Peer group and self-assessment
- Teamwork and leadership
- Business awareness and empathic development

MT has developed since early times as a holistic and imaginative practice and this integrative approach needs to be appreciated and used in new structures.

There are obvious advantages to industry to sponsor the formulation of a strategic plan. This however needs funding to prepare and implement.

Taking care of a teacher's wellbeing results in better learning in the classroom. Proven structures for this exist and have been demonstrated by the George Lucas Foundation "Edutopia" and "CARE for Teachers". Care stands for Cultivating Awareness and Resilience in Education.

Creative Music Technology has a great part to play in these areas and JAMES professionals have the experience to consult on this.

David Ward and Dr. Phil Harding
Executive Director and Vice Chair JAMES.

Equipment specifications.

The cost of setting up a new MT department or adding to existing facilities does not need to be expensive. The most expensive element is generally the computer. Many schools will have existing hardware (computers) that can easily be upgraded with cost-effective music software.

Considerations

When planning and purchasing equipment there are several vital considerations that need to be carefully-thought-out when ordering systems.

- Any system or parts of it must be robust enough to stand the wear and tear of student use.
- These demands are greater than for domestic use and buyers must be aware that if one part of a system breaks down, the whole structure can be jeopardised.
- Cheapness is not always the best investment in the long term and it is essential that buying departments have the correct advice.
- When considering software, the need for software upgrades must be taken into account. These are usually not exorbitant but need to be budgeted for.
- Some companies offer very generous educational discounts. This can be up to 50% off the RRP. Some companies also offer educational volume and site license discounts that increase, the more copies that are purchased. Always ask for an educational price quote and know the site license break points.
- Service and maintenance must be considered in the setting up of systems. It is also vital that attention is given to formats for file transfer, servers and how projects are submitted for assessment. None of these areas are difficult or particularly expensive but need professional consideration.
- The acoustic treatment of spaces, both in terms of isolation and the acoustics of rooms themselves need professional advice from the onset. It is vital that any estates departments are offered consultation on design and building. There are proprietary sound treatment systems that can be cost effective but need to be carefully chosen with professional advice. Sound isolation between classrooms is a more difficult area and should definitely be approached with professional acoustic consultation.

Phil Harding joined the music industry at the Marquee Studios in 1973, engineering for the likes of The Clash, Killing Joke, Toyah and Matt Bianco by the late 1970s.

In the 1980s, Phil mixed for Stock, Aitken & Waterman tracks such as You Spin Me Round by Dead or Alive followed by records for Mel & Kim, Bananarama, Rick Astley, Depeche Mode, Erasure, Pet Shop Boys and Kylie Minogue.

In the 1990s, Phil set up his own facility at The Strongroom with Ian Curnow. Further hits followed with productions for East 17 (including Stay Another Day), Deuce, Boyzone, 911 and Let Loose.

Recent projects include the book PWL from the Factory Floor (2010, Cherry Red Books) and mixing Sir Cliff Richard's 2011 album Soulicious. Harding has recently worked for Holly Johnson (Frankie Goes To Hollywood), Tina Charles, Samantha Fox, Belinda Carlisle and Curiosity with his new production team PJS Productions.

Phil is also Vice Chairman of JAMES and was the Chairman of the Music Producers Guild. Phil completed his doctorate in Music Production at Leeds Beckett University, April 2017.
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David Ward has spent a lifetime in the Music Industry, three years as a club and concert promoter, 12 years as a professional singer and 25 years as a recording studio owner/manager/sound engineer, some of these concurrently. He founded Gateway Studios in 1976 and was also the founder of the Gateway School of Recording, Music Technology and Music Business Studies. Gateway was the first independent music industry school in Europe and pioneered many new learning methods and areas of study.

David's lifelong commitment to education continues with his work as a founder and Executive Director of JAMES. He was also a Director of Education for APRS. He is currently Chair of the Music Education Council, Music Technology Special Interest Group. He helps write qualifications for awarding bodies and travels widely as a consultant to education authorities, government departments and institutions in course design, critical listening skills and education facility design. He has been proud to be an Industrial Fellow of Kingston University and Visiting Professor at the Sibelius Academy, University of the Arts, Finland.

One of David's greatest delights is explaining the world of sound, recording and music production to people and organisations outside the music industry and has recently been involved with designing courses for a major manufacturer of PA equipment. David trained as a therapist in Positive Psychology and uses this work in an education context, researching and developing learning skills. He still sings and performs albeit without the beard and long hair that he used to hide behind.
<http://www.gatewaypdt.org.uk>