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MANAGEMENT STRATEGIES FOR SCHOOL LEADERS

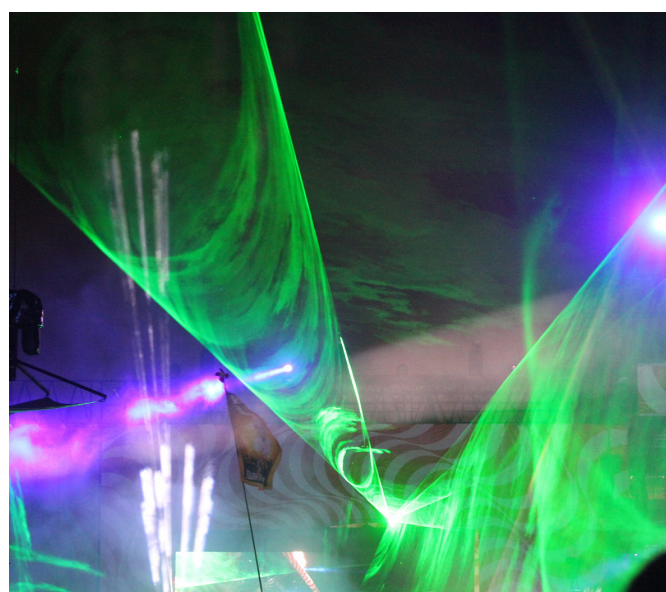
Leading STEAM: Sounds That Electronic Artists Make

At Shenton College, staff are working in collaboration to develop a number of STEAM-inspired learning experiences that will be delivered in 2017

In the current climate, there has been a great deal of conversation in the political and education spheres around the shape of STEM (Science Technology Engineering Mathematics) education, and its first cousin, STEAM (Science Technology Engineering Arts Mathematics) education. Under the National Innovation and Science Agenda's *Inspiring all Australians in digital literacy and STEM* measure, "a variety of initiatives will be introduced to increase the participation of all students and the wider community in STEM and improve their digital literacy" (*Inspiring all Australians in digital literacy and STEM*, 2016). Throughout 2016–17, a total of \$112.2 million will be invested into achieving these outcomes (*Inspiring all Australians in digital literacy and STEM*, 2016). Such financial investment is a strong indicator that the Australian Government considers the future direction and outcomes associated with STEM/STEAM education as 'learning that matters'. In the secondary school context, the challenge this presents calls for a creative, open-minded model of distributed leadership in terms of how educators approach curriculum innovation.

STEAM – or a lot of hot air?

There is a clear need to contextualise STEAM education in a practical, tangible framework that progresses the idea from abstraction into something students can actually *do*. The open-ended nature of this interdisciplinary mode of learning suggests that there is a range of ways to approach STEAM education. This can be achieved through leading a consultative process that engages school leaders, teachers, parents and students. As key stakeholders, government, industry and the broader community should also be invited to discuss what STEAM looks like in the context of their local schools. At Shenton College, staff are working in collaboration



to develop a number of STEAM-inspired learning experiences that will be delivered in 2017 – this article endeavours to articulate the leadership and vision that has culminated in the realisation of one of these course proposals.

Setting the stage for STEAM through the Arts

Murdoch University has contended that "tomorrow's leaders need to be creative and innovative ... collaborative decision-makers and critical reflective thinkers capable of working in multidisciplinary teams", and thus have elected to investigate "unique interdisciplinary synergies between the Arts and STEM" (*STEAM Education: Exploring interdisciplinary synergies between the Arts & STEM Science, Technology, Engineering, Mathematics, n.d.*). Drawing inspiration from this suggestion and reflection on his own experience of the music

e-Leading November 2016 (37) – researched and prepared for ACEL by Drew Mayhills Technology Innovation Coordinator, Google Certified Educator & Level 3 Classroom Teacher Shenton College

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Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Source: Future of Jobs Report, World Economic Forum



Figure 1: Top 10 skills in 2016–2020, World Economic Forum

It quickly became apparent in the initial design phase that a course like ‘Sounds That Electronic Artists Make’ would be an attractive option to students because of how electronic music production speaks to their personal interests

production software Ableton Live, the author became convinced that this software (and its proprietary hardware) provides a rich creative context in which to foreground transformative rich STEAM-infused teaching and learning. For the purposes of this article, the author defines ‘the Arts’ as per the Australian Curriculum: ‘a learning area that draws together (the) related but distinct art forms’ of Dance, Drama, Music, Media Arts and Visual Arts (*The Arts: Introduction – The Australian Curriculum*, vol. 8, no. 2, n.d.).

Ableton Live & Push: a brief introduction

Ableton Live is a music software program for composing and arranging that has been adopted by artists as a sequencer and mixer for use in a live performance context. Often referred to simply as ‘Live’, the software was developed by Ableton AG, a German audio production company

“founded in 1999 and ... headquartered in Berlin, Germany with additional offices in Los Angeles and Pasadena, California” (Learn more about Ableton, n.d.). In the company’s own words: “Live is software for creating musical ideas, turning them into finished songs, and even taking them onto the stage” (Learn more about our music making software Live, n.d.). It allows for more complex mixes to be performed, with users able to mix several different sounds at once, essentially rearranging and restructuring tracks in the live performance environment (Montano, 2010, p. 411). A significant number of artists performing with Ableton Live do so using the company’s proprietary hardware, Push, removing them from interacting directly with the computer and instead placing them in a more traditional role of an artist playing an instrument. A number of innovative artist performances demonstrating Live and Push can be viewed at www.ableton.com.

Leading emergent curriculum: embedding future-focused skill sets

It quickly became apparent in the initial design phase that a course like Sounds That Electronic Artists Make would be an attractive option to students because of how electronic music production speaks to their personal interests, creative passions and social realities. From a leadership perspective, it is obviously not sufficient to simply envision and implement a course because students will think it is ‘cool’. The broader educative opportunity was recognised to leverage this level of interest and engagement in learning as a vehicle for readying students with the requisite skills for engaging in a rapidly changing world. But what skills do we anticipate students will need?

In 2016, the World Economic Forum released a report entitled *The Future of Jobs*, containing



Figure 2: Artist performing with Push 2 hardware

Science	<i>Concepts and understandings including:</i> Volume, pitch, amplitude, velocity, resonance, frequency and modulation in a context where the user is exploring/exploiting them for effect, e.g. mixing and balancing a composition
Technology	<i>Concepts and understandings including:</i> The ways in which technology is engaged in the production of music, e.g. recording, editing, synthesis, visual programming languages all form part of the operation of a digital audio workstation (DAW). Elements of user experience (UX) and application design. Troubleshooting of networks, computers, devices and developing data security protocols.
Engineering	<i>Concepts and understandings including:</i> Development of computational thinking skills, implementation of visual programming languages (e.g. Max MSP) in sound and device design, network infrastructural considerations regarding the integration of Live into performance through wireless networks, integration of software with external hardware, including robotics.
The Arts	<i>Concepts and understandings including:</i> Visual interpretations and expressions developed to accompanying performance, set, stage and sound design, promotional artwork, choreography of routines set to performance, the integration of traditional musical accompaniment (e.g. bands/vocalists), theatrical accompaniment and interpretations.
Mathematics	<i>Concepts and understandings including:</i> Counting, time signatures, meter, beat, tempo, rhythm, beats per minute. Mathematical formulae and experimentation as applied to rhythmic concepts (imposed/implied rhythms, polyrhythms etc.)

Table 1: Concepts and understandings from the individual STEAM disciplines to be embedded in the context of ‘Sounds That Electronic Artists Make’ – an interdisciplinary curriculum in development

projections of the top 10 skills people would need in the workplace by 2020 (*The 10 skills you need to thrive in the Fourth Industrial Revolution*, 2016). Interestingly, there has been a marked increase in the need to cultivate creativity, critical thinking and complex problem solving. Additional shaping of the course vision was taken from the UK-based Innovation Unit’s *10 ideas for 21st century education*, which firmly grounds the need for authenticity of learning and the re-imagining of the traditional roles of teacher and student. Among their most exciting suggestions are that educators ‘measure what matters’, ‘work with families, not children’, and ‘expect (and help) students to be teachers’, all of which has been considered in the development of Sounds That Electronic Artists Make (*10 ideas for 21st Century Education: Innovation Unit*, n.d.). Ableton Live presents a powerful context in which to strengthen these skills – students could be challenged, for example, to develop and perform audio-visual experiences that encourage more Australians to engage in sustainable living in their local communities. An exciting vision was taking shape, but there were now two new challenges: for the unit to gain traction with staff in the interdisciplinary sense, and to assure the development of a course that was intellectually rigorous across the relevant learning areas. In terms of leadership, the next step was to present a curriculum proposal for development with specialist staff across the Science, Technology, Engineering, Arts and Mathematics faculties.

Honouring the Interdisciplinarity of STEAM: Creating a shared vision

Long (2001, p. 280) has stated that *“interdisciplinary teaching, like all good teaching, takes work. It also requires that all members of the instructional team share a common vision, set*

realistic goals, set aside insignificant differences, and celebrate success.” In order to lead a truly interdisciplinary curriculum innovation, clear links to each of the learning areas involved would need to be developed in consultation with staff from the relevant disciplines. Initial discussions with teachers from each learning area set in motion a rich, collaborative process that could inform a framework for curriculum and assessment (Table 1). This conversation is an ongoing one – and from a position of leading rich staff collaboration, one well worth having. As an example, Ableton’s unique integration of a ‘connection kit’ which enables the music production software to be integrated with robotics opens up exciting possibilities for kinetic art projects and exhibitions – try to imagine, for example, dance and drama students performing in a live situation with robots, complemented by mixed-media visualisations. While such projects are no doubt ambitious, such undertakings could well form the basis of an assessable end product.

Adaptive Leadership: Leading learning that matters

School staff charged with leading such unique change would be served well by reflecting on the recommendations of Harvard Graduate School of Education researchers Wilson & Ortega (2013, p. 4), who claim that leading ‘learning that matters’ requires an ‘adaptive’ model of leadership: ‘an examination of *“the leadership behaviour needed to transform schools and innovate in order to create new knowledge in the face of unclearly defined problems... [emphasising] the need for problem finding, experimentation, and developing new knowledge”* (Wilson & Ortega, 2013, p. 9). In designing innovative curriculum for learning that matters, Wilson and Ortega (2013, p. 10) argue that schools should be driven by two principles: *“first,*

‘learning that matters’ requires an ‘adaptive’ model of leadership: ‘an examination of ‘the leadership behaviour needed to transform schools and innovate in order to create new knowledge in the face of unclearly defined problems

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The increasing popularity and relevance of tools like Live and Push that enable 'bedroom producers' to participate in artistic expression open up endless creative possibilities for teachers and students to engage with these principles



Figure 3: Students engaging with Dr Elliot Gann of Today's Future Sound, using Ableton Live and Push during Mental Health Week 2016

learning must be based on the interests and goals of each student. Second, a student's curriculum must be relevant to people and places in their community." The increasing popularity and relevance of tools like Live and Push that enable 'bedroom producers' to participate in artistic expression open up endless creative possibilities for teachers and students to engage with these principles.

Leading new partnerships: technology and wellbeing

The author's direct engagement with industry in the role of Technology Innovation Coordinator has led to the development of an exciting partnership between Shenton College and Ableton AG themselves – one of the first in Australia – as well as significant support in the form of a generous donation of refurbished hardware and software that was 'traded in' to Ableton by music producers all over the world. This has ultimately made the provision of a 1:1 learning experience with Live and Push possible for an entire class. With a vision to establishing the College as a flagship institution for innovative curricula, it is hoped that programs like Sounds That Electronic Artists Make will play a role in the broader discourse at the school system level and inspire other school leaders to continue driving learning into exciting new territory.

Since then, the collaboration between Shenton College and Ableton has laid the foundation for engagement with notable organisations such as the US-based Today's Future Sound (TFS) – a non-profit organisation that *"believe in the power of music to transform and inspire youth to create positive change in their lives and*

communities" (Today's Future Sound, n.d.) The College recently had the opportunity to host TFS's Executive Director, Dr Elliot Gann, while he was in Australia. With over a decade of clinical experience in using Hip Hop and electronic music production to engage disaffected youth in Oakland and the San Francisco Bay Area, Dr Gann led Shenton College students through a 'Making Beats for Wellbeing' workshop as part of Mental Health Week 2016, which was fantastically received. In this regard, the broader implementation of courses like Sounds That Electronic Artists Make throughout Australia could offer a very real solution to some of our most disengaged student communities.

Full STEAM ahead

Wilson and Ortega (2013, p.5) have discussed that *"when examining the persistent challenges a school may face, there may not be a clear solution or established procedure that can remedy the situation."* Responding to the challenge of providing a meaningful STEAM education is one such challenge – one that the author envisions as an opportunity to lead a team towards the implementation of a truly innovative curriculum. While the course is in its infancy, on the strength of the interdisciplinary potential it stands to offer and the significant demand indicated by course enrolment, there is an air of tremendous excitement around how a curriculum innovation like Sounds That Electronic Artists Make will be received in 2017.

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