Chapter 12

Using Experience Design in Curricula to Enhance Creativity and Collaborative Practice in Electronic Music

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> Creative activity is more than a mere cultural frill, it is a crucial factor of human experience, the means of self-revelation, the basis of empathy with others; it inspires both individualism and responsibility, the giving and the sharing of the experience (Hudson, 1979, p.2).

Introduction

This chapter is informed by my work as an electronic music composer and as a lecturer within the University sector. The chapter does not explore the nature of creativity itself (Burnard, 2012) but rather how musical creativities can be facilitated and engendered within academic environments. As a composer interested in engaging students in electronic music composition at University, rather than a music educationalist, I want to bring students together and develop communities of compositional practice in an academic milieu that is stimulating, relevant and supportive. It argues that a flipped classroom[1] approach can facilitate an active

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[1] The practice of delivering a lecture online (e.g. as a video-cast) and then using class time to undertake a practical activity based on this material.

learning environment that can transform student experience. As such, I propose the integration of *experience design* into the creation of new curricula. Through the appropriation of the notion of experience design from business it also demonstrates the importance of the active learning environment in providing a meaningful experience for the student. One of the most important cognitive benefits such scenarios foster is higher mental functioning and learning through interthinking (Littleton & Mercer, 2013). This chapter discusses the ramifications of the integration of experience design into educational practice and the possibilities it offers.

Background

When I was a secondary school pupil, my music lessons comprised my tutor writing on the blackboard whilst we, the students, copied this neatly into our class exercise books. As a mechanism for learning it was a complete waste of time. Outside of class was where I explored and developed my passion for music, particularly composition, through the scores of Lutoslawski and Stravinsky in our local library or through second-hand books.

As a young student, my most memorable learning experiences were with my piano teacher Charles Watmough. Actually the piano only featured briefly. A nominal half an hour lesson on a Thursday evening could easily and would regularly continue for up to three hours. These classes became a stream-of-consciousness musical adventure as we listened to records and played extracts of orchestral scores on the piano. As a musician eager to absorb as much as I could, these experiences were the

highlight of my week. I never knew what was coming, and tried to hide my woeful lack of piano practice by getting Charles off-topic as quickly as possible. Such an experience is a continuing feature of many musicians' education. A great deal of 'real' education occurs outside of formal, institutionalised learning mechanisms (Hargreaves, 2003). Philip Tagg (2012) writes eloquently about a similar figure in his own musical education, his organ teacher Ken Naylor who encouraged him to explore all aspects of music from the anthems and madrigals of Elizabethan composers to Charlie Parker, Bartok and Stravinsky, as well as to improvise and compose. Today the role of such inspiring individuals is often replaced by the Internet and peer-to-peer social groups.

Despite Charles' inspiring model, my initial classes as a young lecturer at the University of Huddersfield followed the familiar pattern from my own education. As a lecturer on a fast growing music technology course, the arguments for one to one electronic music composition classes as opposed to the practicality and financial efficacy of group teaching were soon lost as staff planned classes for increasing numbers, in some instances up to 100 students. The digital workstation as the de facto tool for acquiring technique and creative learning went unquestioned, despite the fact that such tools often immediately isolate students from one another through the use of headphones in class and often prohibit or make collaborative practice difficult. The model adopted for these computer composition classes was a series of lectures demonstrating sampling, synthesis and software techniques and compositional tutorials supported individual assignments. The balance between imparting technical and contextual musico-aesthetic knowledge was and still is, an oft-discussed topic

between those lecturers co-delivering this course. One of the reasons for this on-going debate is the increasing number of students from diverse musical backgrounds and how to accommodate them within one module.

Such a system, concentrating on the individual acquisition of technical skills and a contextual knowledge of pertinent repertoire, can work. However, one of the things I want to evaluate in this chapter is students' experience of composing within an academic environment and whether this could be enhanced through more practice-centred collaborative activity, and in turn, how such collaborative environments can shape creative thinking well beyond the academy. Although Paynter and Aston (1970) proposed that education should be about a broadening of perspective and independent exploration whilst also noting that the examination system implies a focusing in, the survey of courses undertaken for this chapter demonstrates that there is still an emphasis on the systematization and division of music studies into history, analysis, composition and acoustics – a model adopted during the 19th century (Golding, 2009). There is still an underlying premise in these courses that students will 'join the dots' or put the 'jigsaw' together and that such exploration remains an independent practice outside of the formal study time. This chapter challenges this premise. It is informed by cultural historical activity theory (Cole, 1996) in which the individual and their interaction with others within a cultural or institutional environment are considered as a holistic unit of study. I consider this an example of rhizomatic or nodal thinking (Adkins, 2014) about creativity within contemporary culture in which socio-cultural, institutional, interpersonal relationships and an individual's own practice are all part of a network of interlocking nodes that inform collaborative and educational practice.

Two further experiences underpin this research: firstly, during the summer vacation before the final year of junior school, my middle son's passion for the Khan Academy[2] online maths tutorials saw him develop enough knowledge to finish Year 6[3] by taking the SAT[4] examination for Year 9; and secondly, my own learning of the MAX software more from the Baz Tutorials[5] on YouTube. Both of these examples are far from unique and testify to the changing ways in which knowledge is created, distributed and consumed. No longer is the academy the only access to knowledge. In a constantly shifting digital landscape in which the consumption of knowledge is no longer bound by geographic constraints and the increasing democratisation of technology needed to make electronic music, we are forced to ask what can be gained from going into a university setting to study electronic music at all.

As traditional lectures come to resemble press conferences, with a table littered with all manner of portable recording devices, iPhones and even a few retro Dictaphones at the front of the lecture theatre, the challenge today then, is to have classes that offer something unique rather than replicating other forms of knowledge communication and that these classes create a shared and meaningful experience for students. Although Music Technology and Popular Music have challenged more canonically restricted forms of music education (Burnard, 2012), one of the recurring questions is how we, as educators, embrace and encourage nascent artists whose practice and creative work is both diverse and often motivated by personal rather than

academic concerns. Their practice, like that of many electronic musicians, often involves individual and collaborative work with a variety of creative tools other than just a computer, often resulting in artefacts that embrace a variety of new media.

In light of current trends in education such as P21[6] in the USA with its emphasis on fusing the '3Rs and 4Cs' (critical thinking and problem solving, communication, collaboration, and creativity and innovation) to ready every student for the 21st Century, Mark Parkinson[7] writes, 'we need to be innovative and creative. We need to question our teaching techniques and not accept things simply because they have been around for a long time' (Chaudahry, 2013). Parkinson challenges teacher-centric and linear learning methods and calls for the emphasis on the interpersonal competition within education to be replaced with collaboration and reflective learning. Royston Soares[8] identifies why teaching methodology needs to evolve, writing that:

> The educational industry is challenged because business and organisations are shifting from an industrial word to a communication, service world, and the economic, political, and social domains impact education. The changes in society have influenced important assumptions about intelligence and knowledge. The specific implication for the classroom and curriculum is that a learner-centred pedagogy is emerging with the role of the teacher changing from

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[6] http://www.p21.org

[7] Executive Director, GD Goenka School, Sharjah, UAE.

[8] Royston Soares is Principal of GEMS Westminster School, Ras Al Khaimah, UAE.

a content specialist who transmits knowledge to a facilitator of learning (Soares, 2013).

Parkinson and Soares' move away from the teacher-centric approach to learning is akin to Vygotsky's theories of development through social interaction. As our methods of social engagement become increasingly mediated through technology then the roles of the lecturer and student must also be re-evaluated. As lecturers become facilitators of technologically mediated compositional experiences for students, so learning becomes a reciprocal act between peers from which knowledge is gained through retrospective reflection. Vygotsky (1962) considers culture to be a determining factor for knowledge construction. In the academy, the culture in which compositional activity can take place needs to be designed to produce rich experiences for students. Student experience should not merely be an outcome of collaborative activity but is something that should be consciously considered by the lecturer at the outset. Through reflecting on our compositional experiences, be they individual or collaborative, our perception, cognitive development, and technical abilities become solidified into new knowledge patterns.

Existing Practice

The composition of electronic music has historically resulted from a hybrid of technical and creative knowledge. This hybridity reflects a bi-directional process. While compositional creativity is something that can develop independently of technology and that an understanding of music technology can itself inspire creativity

(Nuhn et al, 2002).

For this study, 30 higher education institutes across England and North America were surveyed.[9] The purpose of the survey was to find out:

1.   How electronic music composition teaching was situated within the Department's surveyed?   (For instance, was it part of a dedicated Music Technology program or merely an option within a Music degree);

2.   How electronic music composition was being taught?   (Was it being taught in small or large groups; in studios or workstation rooms);

3.   Was the emphasis on individual or collaborative compositional projects?

4.   Was collaboration focused on composition or performance of electronic music and to what extent these activities were extra-curricula;

5.   What was the musical background and literacy of a) the lecturer and b) the student's undertaking the course?

The prevailing paradigm emerging from this work reveals an approach to composition still predominantly centred on the individual and their creative practice. Furthermore, although laptop orchestras and hacking groups formed part of extra-curricula activities, the main approach to teaching electronic music composition were

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[9] The survey comprised 30 institutions where electronic music composition is taught within Music Departments either as a separate Music Technology program or as part of the composition curriculum within a Music degree.

fundamentally no different to those of acoustic composition. In addition, although portable digital technologies such as smartphones and tablets enable more flexible and collaborative working environments (Ruthmann, 2007) all 30 institutions still focused their teaching around fixed computer workstations or studio based practice. One of the reasons cited for this 'traditional' practice was that at University level working with portable digital technologies did not encourage the critical listening that lecturers wanted their students to acquire. A generational factor, and one that will certainly change, is that many of the lecturers teaching electronic music composition came from either a background which privileged Western art music with its inherent 'cult of the Romantic stereotypes of the creator as individual genius' and 'the fetishization of composition, mythologized as a fixed thing' (Burnard, 2012) or a computer science background and had subsequently moved into music technology. The disjunction occurs as that paradigm Burnard seeks to overturn it is often still relevant for many of the lecturers teaching electronic music composition. It was found that students on such composition courses came from diverse backgrounds with interests in classical and popular music, music technology and sonic art or fine art backgrounds. This is a tendency that will only increase in the future as technology continues to proliferate within educational contexts, particularly music. Burnard writes 'For new generations, commercial music, web space, and the ever-expanding web world provide a dynamic and complex context wherein all kinds of creativity nestles in the nooks and crannies' and that 'musical creativities assume many forms, and serve many diverse functions, and are deeply embedded in the dynamic flux and mutation of a musician's personal and sociocultural life.' (Burnard, 2012). Where group work is encouraged, it often takes the form of performance-based live electronic work and is an adjunct module to

those in composition or is an extra curricula activity. Differences in aesthetic approaches are also evident. While some universities teach through the emulation of genres in the manner of a traditional conservatoire, requiring a musique concrète etude or a composition made solely with synthesis techniques, others promote a more open approach from the very beginning. Ambrose Field[10] writes:

Students in my classes take part in both individual and group approaches to electronics. The 'doing' of composition is the most important aspect for me not the software or the technology. We don't teach software, our methods are sometimes surprisingly low-tech, but we ask our students to focus on their own individual aesthetics and ideas. No one aesthetic approach is foregrounded as a model - for instance, there is no 'acousmatic class', but instead, a spectrum of practice from independent computer music to alternative computer-based art music is encountered. My only rule is that there is to be no 'pastiche' - everyone must say something individual with his or her music (Field, 2013).

This aesthetically open approach is one that has produced much original work from the University of York studios in recent years, particularly that of Radoslaw Rudnicki[11] and reflects a growing post-acousmatic aesthetic perspective within academia. Nevertheless, the focus on the development of individual compositional creative practice often results in collaborative composition and the performance

[10] Dr. Ambrose Field is Head of Department of Music, University of York, UK.

[11] Rudnicki, Radoslaw (2012) *Portfolio of Compositions.* PhD thesis, University of York.

practice of electronic music being considered distinct activities. This ethos is evident at the University of Sheffield. Individual electronic music composition classes form the backbone of the course. In addition, there is a collaborative project, which bring together a composer, performer and programmer and a Synthesis and Programming module, which is partly assessed via group work in a Supercollider ensemble. This is the primary model repeated across the institutions involved in this study.

A large proportion of the institutions surveyed have a laptop ensemble or an experimental electronics performance group.[12] These groups take many forms and serve different functions within their respective institutions though many act as an unofficial 'glue' bringing elements of individual courses together. The Dirty Electronics group directed by John Richards at De Montfort University is a non-assessed group. However, parts of the curriculum feed directly into the activities of this group. These include the building of no-input mixers, an optical Pianola, hacking and instrument building, and developing an understanding of basic electronics. This interest in performance practice is also reflected in the Concordia University Electroacoustic Studies program, which includes assignments in Years 1 and 2 in collaborative composition and performance with optional credit for the Concordia Laptop Orchestra (CLOrk) and further performance focused activity in a Live Digital Practices module. The proliferation of the n-Ork laptop model does encourage collaborative practice in which the roles of composer, performer and programmer are often fluid. However, as Hilliges et al note, 'the user's concentration has to shift away from the group and towards the computer' (Hilliges et al, 2007, p.137) often resulting

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[12] 24 of the 30 institutions had an assessed or extra-curricula performance group.

in a composition produced by a collective of individuals rather than truly collaborative experience.

This disaggregation between composition, collaboration and performance is a common feature of the research findings of this study. Although there is creativity involved in technologically mediated performance it is not necessarily focused on 'compositional' activity - it is the investigation and use of performance technologies that is foregrounded. Diana Salazar writes that the most important element in her teaching is 'to get the students thinking about the performance of electronic music, and collaborative working methods, skills that I think can sometimes be overlooked in Music Technology degrees that may rely heavily on solitary working methods in studio recording/mixing/composition' (Salazar, 2013).

What clearly arises from this research is that electronic music composition is seen as a different activity from collaborative work and the distributed creativity (Sawyer and DeZutter, 2009) arising from the use of performance technologies. Despite the advent of portable digital technologies and the demystification of creativity and the composer genius (Burnard, 2012) through the democratisation of technology, it is clear that this model is still applied (consciously or not) in many institutions. What I conclude from this study is that the pedagogic models used in the teaching of electronic music composition is not viewed significantly differently from acoustic composition, it is merely the tools and the move from notation to a GUI that has changed. What is equally evident is that this compartmentalisation of practice is recognised by students and leads to a schism between their academic work and external artistic practice. Furthermore, students' identification that group work may

result in their obtaining a lower mark and having little relation to their 'real' work outside of the classroom propagates an unhealthy divide between artistic development and educational practice. Although academia demands quantifiable assignments we have to acknowledge that in the development of creativity and the creation of musical works that there is no ideal production recipe; that creativity is essentially a messy process involving the generation of much redundant material, ideas, and cul-de-sacs that seemed so promising at the time before a final path presents itself.

Whilst many composers and sonic artists still work individually, there are an increasing number for whom the embracing of digital technology is fundamentally changing their approach to the work (Brian Eno[13]), long-term collaborations (@C[14], Autechre[15]), distributed creativity and audio-visual collaborative practice (Skoltz-Kolgen[16]) or team-based (Kaffe Matthews working with programmer Dave Griffiths, software engineer Wolfgang Hauptfleisch and hardware designer Alexei Blinov). Whilst some still do adhere to the notion of 'spectacle' there is a move away from Bourdieu's 'charismatic ideology of creation'[17] which 'directs the gaze to the apparent producer – painter, composer, writer – and prevents us from asking who has created this 'creator' and the magic power of transubstantiation with which the 'creator' is endowed' (Bourdieu, 1996/1992, p.167). We need to reflect these contemporary approaches into our teaching and acknowledge that at present the majority of electronic music composition teaching is being squashed into an old paradigm. We

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[13] In generative works such as *Bloom.*

[14] Miguel Carvalhais and Pedro Tudela.

[15] Rob Brown and Sean Booth.

[16] Dominique Skoltz and Herman Kolgen – active as a duo from 1996-2008.

[17] Through virtual bands such as Gorillaz and the anonymity sought by Burial.

need to question the nature of composition as a tangible artwork. Burnard writing about Margolis (1977), Goehr (1992) and Wolterstorff (1994) states that they all 'considered that a necessary pre-condition for composition was a work-concept that affected the way compositions were judged, valued, and received. For many current music technology students the notion of the work-concept is largely irrelevant and something they only encounter when completing academic assignments.

The question I want to address is how an individual's creative practice can be developed through collaborative composition and how *experience design* can be used to facilitate this. Although informed by Bourdieu's *The Rules of Art* as well as Becker's sociology of art and the Marxian ideologies of creativity put forward by Wolff (1993) I apply these ideas at a more local, individual level. Rather than seeing collaboration as an occasional adjunct to individual compositional work I argue that it should be regarded as an essential parallel activity through which a symbiotic and richer understanding of creative practice emerges. I acknowledge that collaboration is something that has to be culturally negotiated and learned (Dawes & Sams, 2004; Grossen & Bachmann, 2000) and that it presents challenges to professional artists as well as undergraduate students. Nevertheless, the potential pedagogic benefits are significant. More importantly, as the Internet becomes ever more a tool for learning I want to examine the possible motivations and opportunities afforded to studying electronic music composition at University.

The Social Musician

As I am advocating the benefits to individual creativity of collaborative

practice (Sawyer, 2012), it could be argued that the democratization and proliferation of technology that has resulted in a plethora of online learning environments and compositional resources becoming available contradicts this position, further isolating the individual from social learning situations. It is readily accepted that information communication technology (ICT) is driving fundamental change in learning and teaching as well as research practices (Cain, 2004; Seddon, 2004), and according to John Seely Brown and Richard Adler (2008), social learning areas, including virtual worlds, can 'coexist with and expand traditional education' (Brown & Adler, 2008 p. 22). It is the 'coexisting' of resources that should be emphasized here. The development of MOOCs (Massive Open Online Courses) have 'been hailed as both a revolution in access to information and a harbinger of corporatized educational doom' and that 'MOOCs as a fast, cheap alternative to a traditional college education… could result in a two tiered class system in which rich students get face time and poor students get screen time' (McSweeney, 2013).

As a composer and performer, I want to make music. I want to share music as I find great inspiration and artistic satisfaction in working with people in the same room at the same time. My learning of Max demonstrates this. Following the acquisition of certain techniques it was only when I came to apply those techniques and faltered that the ability to sit down with colleagues and work through the materials and ask questions solidified my knowledge into a concrete practice. McSweeney writes:

The crux of the issue is that what one does in a college class is more than acquire content. MOOCs are great for the content part, but the community insights, the ability to synthesize material, those higher-order processes happen because you are studying a common area. They are not themselves the common area of study. And the thing we know from longitudinal studies of students is that they don't remember the content, but they do retain the intuitions that they developed while working through that content. That's the part that we could lose when schools are relying too heavily on digital media (McSweeney, 2013).

McSweeney's quotation has two elements that can be usefully further explored here: the first concerns her notion of community insights and the second the retention of information by students. The first has strong resonances with Etienne Wenger's notion of social learning systems (Wenger 1998). Wenger posits that learning is fundamentally a social act in which we participate through engagement, imagination, and alignment. Wenger writes that:

Our experience of life and the social standards of competence of our communities are not necessarily, or even usually, congruent. We each experience knowing in our own ways. Socially defined competence is always in interplay with our experience. It is in this interplay that learning takes place (Wenger, 1998).

Trying to accommodate and assimilate the various competences and stylistic interests that students of electronic music have into a composition course is challenging but not impossible. This involves a refocusing of content to reflect creativity, critical thinking and the development of knowledge through reflective practice rather than product. For many students, this process-driven approach is a common model through their work in bands - one in which music is essentially collaborative, where a track is developed as a group, often involving the assembling and development of materials and ideas in real time, testing their viability before adding the next element to the song. This model is equivalent to 'devising' in theatre and contemporary dance.

Where collaborative practice takes place within the same discipline collaborators draw on knowledge of culturally established ways of making work (Green, 2002). In collaborative electronic music composition two working methods present themselves. Due to the diversity of contemporary electronic music, 'culturally established' working methods differ, as does negotiation of the technology itself. Through the mediation of these practices new ways of making work may emerge. The second more radical approach is to create or design situations that actively engender a sense of cognitive dissonance (Festinger, 1985) in students. It is possible to move outside of a student's culturally established means of working through advocating a neutral base where all participants are novices. This can be achieved through the use of graphic scores and improvisatory practices as well as using objects to create sound with which the students have no previous performance practice. Each method aims to promote cognitive growth by means of social interaction through composition.

Vygotsky's theories of social learning underpin method one and Aronson (1995) has demonstrated that resolving cognitive dissonance (method two) can have a significant impact on a student's motivation for learning. Vygotsky's theories provide a strong argument for collaborative practice and consider how people interact in cultural, conceptual and social contexts to create new knowledge. Vygotsky outlined three key principles in his work. Elizabeth Dobson writes that there is:

> […] an emphasis on the socially situated development of knowledge. Interested in the development of higher mental functions, his theoretical position focused on the significance of social interaction in human activity, and the development of socially and culturally mediated understanding (Vygotsky, 1978) […] Vygotsky theorized that human activity, higher mental functioning in particular, is mediated through inter-relationships with social and cultural tools (Dobson, 2012 pp.25-26).

This suggests that social interaction and inter-relationships can aid in the development of individual creativity. One of the benefits of collaborative work is in recognising and appreciating the ideas and skills of others and learning from them by appropriating, adapting and developing these into an individual practice. Here Vygotsky's concepts of the More Knowledgeable Other (MKO) and the Zone of Proximal Development (Vygotsky, 1962) are pertinent. The MKO is defined as someone who has a high ability than another - a teacher or a student peer. Vygotsky's theory proposes that through dialogue, the development of an individual can be

enhanced through the interaction of one who is more experienced. Although various models are proposed this could easily be applied to student groups and the hierarchies that would form within them depending on previous experience. Dobson writes that 'Vygotsky describes the ZPD as an area of developmental potential, represented as an elastic area of cognitive difference between what an individual can achieve alone and what can be achieved through interaction with another person   (Vygotsky, 1978)' (Dobson, 2012). Further research in this area (Doise and Mugny 1978, Wegerif 2007, 2010), draws much from Piaget's theory of cognitive disturbance, proposing that there is a direct correlation between social interaction, collaboration and the affordance of cognitive development.   Extending Vygotsky's ZPD, Neil Mercer developed the IDZ (intermental development zone) where meaning is jointly formulated. The IDZ is '... a dynamic frame of reference which is reconstituted constantly as the dialogue continues, so enabling the teacher and learner to think together through the activity...' (Mercer, 2002, p.143) and later in collaboration with Karen Littleton proposed the Intermental Creative Zone (Littleton & Mercer, 2013, p. 114). In electronic music composition, collaborative work can therefore lead to a questioning of an individual's existing musical practice and prejudices and through the negotiation of new forms, new methods of sound production or approaching technical challenges can stimulate the creation of new shared knowledge schemas that result in an active learning framework that extends beyond what the individual alone could achieve.

Active Learning and the Flipped Classroom

Moving towards a compositional practice that involves both individual and collaborative work for undergraduates and simultaneously using the flipped classroom approach drives active student learning. This is where specifically designed online tools can facilitate the learning experience rather than leading to an increased sense of isolation. This flipped classroom as exemplified by the Khan Academy, works well for technology based music as software techniques can be contained within Ted Talk length screencasts[18] that can be rewound. Kotler & Roberto (1989) recognize that individuals have selective attention, only retaining a small part of any message in memory. Although their work is in the sphere of social marketing it is equally applicable to other social situations including that of the lecture and resonates with McSweeney's findings in longitudinal studies of students. The flipped classroom approach allows the use of the classroom time for student-centred collaborative learning activities rather than traditional lectures which no matter how engaging often engender cognitive overload. Merkt observes that 'there is a mismatch of the presentation pace and the recipients' cognitive capacities' (Merkt et al., 2011 p.689). The advantage of the flipped classroom is that it also encourages through practical activity a sense of questioning-through-doing. The key point is how information is turned not just into knowledge but applied-knowledge transferable to a number of situations. Cath Ellis writes that:

Active learning promotes the application of content material while it is still being learned and presented. It engages students more deeply in the process of

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[18] Ted Talks are more than 20 minutes in length.

learning course material by encouraging critical thinking and fostering the development of self-directed learning. Active learning affords the opportunity for application and practice, and the asking of questions. Additionally it is possible to assess and remediate student understanding in real time (Ellis, 2013).

Designing 'experience' in composition

The flipped classroom therefore affords time for academics to engage with students in potentially new and innovative ways. Through providing online resources that provide content and provide a foundation for the acquisition of technical knowledge, academics can use classroom time to provide an active learning environment focused on innovation and experimentation and exploring these through creative activities. This learning environment can be even richer when considering the development of new pedagogic tools in the context of *experience design*.

B. Joseph Pine II and James H. Gilmore (1998) discuss what they term the *experience economy*. They chart economic progress through the simple example of the making of a birthday cake for a party: firstly the birthday cake was made from scratch, then premixed ingredients, then bought from a bakers, then the whole party is outsourced to a play centre or event organizer. Pine and Gilmore describe this as the 'fourth economic offering because consumers unquestionably desire experiences, and more and more businesses are responding by explicitly designing and promoting them' and that 'experiences have emerged as the next step in what we call the

progression of economic value… many companies simply wrap experiences around their traditional offerings to sell them better… however, businesses must deliberately design engaging experiences that command a fee' (Pine and Gilmore, 1998).

Traditionally, we think of such experiences as being focused around theme parks, virtual reality simulators, interactive games and event organisers such as wedding planners, but rarely education. In considering experience design in education what we are questioning from a pedagogic perspective is the value of coming to university and undertaking a course and that the knowledge gained through this experience is as valuable (if not more valuable) than merely the information that is imparted. Experiences can be emotional, physical or intellectual and cannot be delivered on demand. The ramifications of any given experience only emerge after a prolonged engagement with the activity and the context in which it was undertaken, in this case collaborative electronic music composition. Mihaly Csikszentmihalyi and Michael Rochberg-Halton (1981) consider experience as a transaction and that this process emphasises both the person and the 'things' surrounding the activity, and as this communicative process unfolds it results in more knowledge and meaning for the person. Forlizzi writes that:

The process of change shapes the flow of experience into an experience. All of life is a succession of loss and recovery of temporary equilibria, want and fulfilment, doing and not doing. Changes over time bear a new state of harmonious balance. When an organism returns to stability, after having

passed through a phase of disruption, Dewey feels the conditions for an experience are in place. A starting point and an ending point define an experience, which is shaped by an aesthetic rhythm, and a unity of action, feeling, and meaning (Forlizzi, 1997, p.12).

In accepting that universities are no longer a service industry for the acquisition of knowledge, experience design offers an alternative for maintaining face time with students. However, the designing of such experiences also has pedagogic worth. In an educational setting we see that such experience design can be extremely effective in building a community of students and developing learning environments - a balance between subjective experience and objective learning. Experience design does not have the communication of knowledge at its heart but is a means of facilitating this process in the most stimulating manner possible. The aim then is to deliver a meaningful experience through a variety of active learning situations that endures and enriches the participant. Where this experience is positive it actively reinforces the concretization of reflective knowledge. I propose that experience design is essential to 21st century pedagogic practice and will impact significantly on the design and delivery of courses across music and the arts often conflicting with the formal and compartmentalized education system we now have which is bound administratively to courses and modules.

Engendering experiences outside of a student's established modus operandi can be as disconcerting as it is positive. Etienne Wenger discusses experiences outside

of the known, writing that:

> We have an experience that opens our eyes to a new way of looking at the world. This experience does not fully fit in the current practice of our home communities. We now see limitations we were not aware of before. We come back to our peers, try to communicate our experience, attempt to explain what we have discovered, so they too can expand their horizon. In the process, we are trying to change how our community defines competence (and we are actually deepening our own experience) (Wenger, 2000).

Wenger continues:

> Inside a community, learning takes place because competence and experience need to converge for a community to exist. At the boundaries, competence and experience tend to diverge: a boundary interaction is usually an experience of being exposed to a foreign competence. Such reconfigurations of the relation between competence and experience are an important aspect of learning. If competence and experience are too close, if they always match, not much learning is likely to take place. There are no challenges; the community is losing its dynamism and the practice is in danger of becoming stale. Conversely, if experience and competence are too disconnected, if the distance is too great, not

much learning is likely to take place either (Wenger, 2000 p.233).

Designing experience through active learning opens students to possibilities that may inform their ideas or creative process in order to make them better at what they do. In some instances this may result in a broadening of their aesthetic, whilst in others the adoption of a particular technique into a new musical domain. For others it may actually solidify their practice within a small niche genre, happy to do so but now knowing how their work can be contextualised within a wider framework of creative practice. Through considering both the individual and collaborative approaches to electronic music composition and the flipped classroom to engender this, the aim then is for the students to achieve seamless learning. Seamless learning occurs when a student experiences a continuity of learning across a combination of technologies, social settings, times and locations. As a result of experience design knowledge is reflectively accumulated largely a posteriori of the activity itself.

How do we facilitate 'experience' and seamless learning?

The application of the ideas and concepts outlined above has resulted in the rethinking of the delivery of two interconnected first year modules that I involved in delivering: the practically oriented Computer Composition and the theoretically biased Grooves, Glitches and Crackles which looks at ways in which technology has changed how we produce, listen and disseminate music through a number of case studies ranging from Russolo to Fennesz via Jimi Hendrix. The delineation of the

content into separate modules and the time allocated to each are now being treated a mere container for activities to occur within a fluid exploration of theory and practice.

The decision to start in the first year was to encourage the symbiotic pedagogic value that working individually and collaboratively could have from the start of a student's university education. Furthermore, from a practical perspective, the content of the modules changes little from year to year and is therefore worth investing significant time in ensuring that the online resources are of the highest quality. In Computer Composition we introduce sequencing, digital synthesis, sampling, more sample-based processing techniques including granular synthesis as well as FFT based sound transformation. This technical knowledge is supported in Grooves Glitches and Crackles by discussion of, and listening to, artists as diverse as Steve Reich, Chlorgeslecht, Merzbow, Amon Tobin, Francis Dhomont, Tim Hecker, DJ Shadow, Qbert, Bjork and Burial, and understanding the context in which this work was created. This listening stresses a deliberately rhizomatic or nomadic listening unfettered by stylistic or genre constraints.

We have developed extensive online video materials for Logic, so flipping the classroom. Such bespoke videos whilst serving the same purpose as those on YouTube enable us to focus more directly on the key skills we wish to embed in our students. This allows the procedural knowledge to be delivered online which results in more individual and collaborative student-led compositional active learning content. In the future, whilst we will continue to make use of Vimeo, ituneU, and YouTube we are increasingly aware that experience design tells us that the use of bespoke course videos creates more of a brand identity and sense of belonging on the part of students,

even a sense of brand loyalty. Often such videos are much shorter than the traditional lecture of one hour. This technique is backed up by research by Demetry (2010) who's research indicates that 'two to three microlectures … 10-15 minutes in length and tightly focused on a specific instructional objective' is most effective.

Following the flipping of the classroom we have created groups within the first year cohort. This allows students to get to know one another quickly rather than sitting in an anonymous lecture and then working in a workstation room individually on a computer using headphones. Also, changing groups regularly for initial small projects allows students to assess each other's skills and interests. As a result groups start to form naturally so that there is a transition between lecturer-initiated groups to student-led group formation. Such student-led groupings mitigate against the concern many students expressed that such collaborative work would bring their individual mark down. The online sharing of the resulting group and individual work allows a group critique to develop. People take a pride in what they do and as long as properly monitored provides a community feedback to the student rather than an individual piece produced in a workstation.

This projects we have undertaken are varied. Three specific ones are: the use of the APP Impaktor, which turns any flat surface into a percussion instrument. Interesting musical results emerge when groups of students move beyond the traditional drummer mentality and start using keys, water bottles and coins to trigger more sophisticated gestures; the creation of live musique concrète pieces using objects, microphones and Ableton Live with multiple effects on multiple incoming tracks and mixing between the processed tracks using a Korg NanoKontrol; and the

creation of live ambient music with students using ebows on guitars and piano strings, objects (processed in the manner outlined above) and triggered field recordings played through mobile phones and iPads all spatially located around the lecture theatre. The emphasis here is to provide a rich experience, which encourages the student to follow up the class by self- or group-directed learning. Finally we have used Logic and a controller to create live electronic group work in a workstation room using the limitations of the iMac speakers, encouraging students to think about their spatial position in the room. Some choose to cluster in one sport while others spread to the periphery of the room. The examples also draw together different forms of creativity. They demonstrate that composition in the traditional sense is now only one area of digital music making which includes live electronics, adaptive audio for computer games, composed audio-visual works, as well as sound design. Student feedback from these projects has been overwhelmingly positive.

The purpose of such activities is to propose that electronic music composition moves beyond the *fixed*. Of course, David Tudor has already done this in his live electronic works over forty years ago, but it is interesting to note that Goehr (1992, in Burnard, 2012, p.29) still proposes 'a function of the composition is to produce an enduring artefact'.

In revising our approach to electronic music composition, modes of assessment have also been reconfigured. We have moved from assessment-driven or outcome-driven models to student-centred assignments. I would argue that at such a stage in a student's career that outcome driven models are only useful in marking a students achievement against prescribed criteria rather than taking into account the

growth and development a student may have undergone. If we consider com-position as the art of putting things together, then questioning our reasons and motivations for trying unusual or different combinations is as valuable a learning experience as producing yet another work within an established model. Mark Lepper and David Greene carried out an interesting study about extrinsic rewards on intrinsic motivation in 1975. Although their research concerned school children, the results are nevertheless worth considering here. They maintain that:

In these studies, children in individual sessions either were led to expect and then were given an extrinsic reward for engaging in an activity of initial intrinsic interest; were given this same reward unexpectedly after they had finished with the activity; or were offered no extrinsic reward for engaging in the activity. Subsequently, unobtrusive measures of these children's intrinsic interest in the activity were obtained in their classrooms, in the absence of any expectation of reward. The results in both studies indicated that expectation of a reward while engaging in the activity, relative to the other conditions, significantly undermined the children's intrinsic interest in that activity (Lepper & Greene, 1975).

Another important assessment development is replacing critical commentaries with an online blog, WIKI or sketchbook containing preliminary audio material, links to video art and other influential material. This acts as a repository that is useful for the student to return to in the future rather than a closed report at the end of the

module. The history of music is littered with examples of composers from Beethoven, Elgar, Boulez and William Basinski returning to musical ideas they developed often decades earlier.

Real-world collaborations always bring about new experiences that feed individual creativity. Knowledge construction continues beyond the academy and occurs within Vygotsky's social context that involves collaboration on real world problems or tasks that build on each person's skills and experience shaped by each individual's culture (Vygotsky, 1978, p.102). An exchange with Miguel Carvalhais, a sound artist, co-director of the Cronica label, and design lecturer highlights this. Carvalhais, who has worked with fellow sound artist Pedro Tudela as @C for over a decade, writes that collaboration is the primary means by which he works because:

> I come from a background in communication design for new media and that's increasingly how we tend to work nowadays. Over the years we [@C] have collaborated more or less regularly with other artists or projects … with Pedro — especially after collaborating on the @c project— we're not only able to maximize each other's potential and creative freedom as we're able to complement them, with respect for each one's individuality, personality and authorship. Collaborations are also constantly challenging, forcing us to negotiate many (if not all) decisions and to permanently broaden our skills (Carvalhais, 2013).

Conclusion

This chapter demonstrates that experience design should be considered an essential part of curriculum design in the early 21st century. It shows that experience design can enhance a student's learning and engender challenging and stimulating environments for both individual and collaborative creativity. If implemented to the fullest extent, experience design impacts on curriculum design, teaching methodology, assessment strategy as well as making the approach to composition one that reflects the plethora of contemporary approaches to sound rather than one dominant tradition. As Burnard writes, 'We need to acknowledge the myriad of forms of multiply mediated musical creativities that arise in musical spaces that are deeply influenced by a series of complex factors…' (Burnard, 2012, p.237).

What I have endeavoured to demonstrate in this chapter is that we are all engaged in local and global communities of practice. We talk and discuss ideas with friends; post on online discussion forums and some even take part in networked performances. Working collaboratively on electronic music composition projects is an essential part of stimulating both the acquisition of core skills and ideas that form the basis of life-long learning and experiences. A university is also a safe environment to experiment, to fail, and then fail better.

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