An empirical study into the learning practices and enculturation of DJs, Turntablists, Hip-hop and dance music producers

Key words: music technology, learning practices, DJs, Turntablists, Producers.

Abstract

This study explores the music practices and learning strategies of nine popular electronic musicians (DJs, turntablists, Hip-hop and dance music producers) through the consideration of current literature in empirical music studies, trends in music education and the theme of musical enculturation as a key component of a popular electronic musician's development. Following the investigation into the learning practices employed by the musicians, as they gather the necessary skills and knowledge to compose, arrange, produce and perform dance and Hip-hop genres of electronic music, the paper goes on to consider whether the learning practices and values expressed by the musicians could be realistically adapted or included within formal music education.

Introduction

In formal educational institutions in the UK, and particularly in Higher Education (HE), the practical study of dance music and Hip-hop genres has been unequivocally avoided in favour of more traditional Western Art music. Although a significant move forward in the recognition of popular music, with the introduction of Anglo-American guitar-based rock in institutions in the UK during the 1980s and 1990s, the conventions of Western Art music pedagogy as observed by Campbell (1991) are still evident today. Rock-based popular musicians are more easily integrated into formal education institutions using Western Art pedagogical frameworks with a focus on instrumental tuition in combination with the study of music theory and composition. The popular electronic musician however, is less easily integrated into formal

1

educational institutions, primarily because an instrument is not 'played' in the traditional sense and technology provides the basis for compositional and performance methods.

As formal music education options have developed in HE in the UK[1], popular electronic music has been largely disregarded within areas that could facilitate its inclusion. The area of Music Technology, for instance, has surfaced as a discrete discipline at all levels of education in the UK and in particular the Higher Education sector (Boehm, 2007). Music Technology courses employ music-making in its broadest sense, ranging from computer-generated music, music programming, music sequencing and music recording, however, many of these courses fail to integrate popular electronic music practices, such as turntablism or Deejaying, into its taxonomy of musical study. As a consequence, the musical skills and knowledge required to compose, arrange and perform dance and Hip-hop styles of music have often been overlooked.

Academic enquiry into the techniques employed in popular electronic music-making is necessary, not only to acknowledge these areas of popular music as worthy of study and validate DJs, turntablists, dance and Hip-hop producers as musicians in their own right, but gaining a greater understanding of the learning strategies involved in the development of their musical skills and knowledge could further inform existing models of music pedagogy in formal educational institutions.

As an extension of previous studies into informal musical learning practices (Green 2002, Davis 2005, Green 2006) within popular music, this study begins by reviewing some of the relevant scholarly literature surrounding informal music-making of both rock-based popular musicians and popular electronic musicians. The adopted methodological approach is clarified before drawing on the data gathered during the investigation into the informal learning practices of the musicians as they develop the necessary skills and knowledge to compose, arrange, produce and perform dance and

---

[1] Performing a UCAS (University and College Admissions Service) search, across music courses in UK Higher Education instituions, produces 39 distinct music related areas (including Creative Music, Music Performance, Popular Music, Music History, Music Production and Music Technology), The search was performed using http://search.ucas.com/ and selecting 'music' as the subject search for courses beginning in 2011.

Hip-hop genres of electronic music. Finally, the learning strategies of the musicians are examined through the consideration of enculturation and it is discussed whether these learning practices can be appropriately integrated into popular music and music technology pedagogy within formal educational institutions.

Context

Ethnographic studies involving popular musicians have tended to focus on the broader themes surrounding music-making (Bennett 1980, Finnegan 1989, Cohen 1991, Berger, 1999). Bennett's work in Colorado, USA outlined how a person becomes a local rock musician in a covers band and plays to an audience. Beginning with instrument acquisition, the rock musician develops their skills through working with other musicians in bands, which then progresses to performance (Bennett, 1980). Sara Cohen's empirical work with amateur rock bands illuminated aspects of music-making in Liverpool, whilst Ruth Finnegan's work uncovered 'hidden' musicians and their patterns of music-making in Milton Keynes. Finnegan echoed Bennett's findings that rock musicians were largely self-taught and joined bands early on in their development, and her broad study of music-making and musical activities also uncovered: 'Several different musical worlds…each having its own contrasting conventions about the proper modes of learning, transmission, composition or performance' (1989, p.6).

Ethnographic studies into popular electronic music and musicians, and in particular dance musics such as rave and techno, gloss over the finer points of music-making in favour of a broader discussion of the cultures surrounding them (Thornton 1996, Brewster & Broughton 1999, Malbon 1999, Bennett 2000, Pini 2000, Jackson 2004 and Brewster & Broughton 2011). Bill Brewster and Frank Broughton (2011) draw on extensive interviews with DJs across the broad range of disc cultures, with a focus on the philosophies, techniques and anecdotes from some of the more commerically successfully DJs from the last 50 years. Kai Fikentscher's ethnographic work (2000) in the area of underground dance music in New York City, USA is one of the minority studies that provides a detailed account of DJ practices through extended discussion with practitioners and participant observation of performances. Fikentscher covers 'the cult and culture of the DJ' and through empirical analysis of both

technique and technology, considers the musical skills of the DJ, the DJ's musical instrument and how the DJ "makes" music (2000, p.35).

Studies on Hip-hop performance and production too, are in the main more concerned with the broader discussion of Hip-hop's cultural and socio-political aspects and specific empirical studies into this area of music-making are relatively few (Rose 1994, Norfleet 1997, Katz 2004, Söderman and Folkestad 2004, Schloss 2005 and Solomon 2005). Mark Katz investigates the practice of turntablism focussing on the techniques, the technology, the values and the traditions surrounding its practice. The study is framed with a specific ethnographic focus on a DJ battle performance, in which two turntablists go head-to-head in a bid to 'out-perform' each other (Katz, 2004). Söderman and Folkestad (2004) investigated the creative learning process of Swedish Hip-hop artists during a recording session, focusing on the informal strategies employed by the musicians as they developed their musical and lyrical ideas. Thomas Solomon's study of Turkish Hip-hop artists explored how Hip-hop musicians used their music to construct a local identity, specific to their locality of Istanbul and Joseph Schloss' (2005) extensive ethnography with Hip-hop producers and performers uncovered the practical and cultural aspects surrounding Hip-hop production and the music-making process of Hip-hop sampling.

Although learning practices are only inferred throughout the majority of these studies, they nevertheless provide a sufficient starting point on which to base an in-depth investigation and discussion into the development of popular electronic musicians. In addition, Lucy Green's study (2002) focussed specifically on the learning strategies employed by guitar-based popular musicians as they develop their skills and knowledge in both formal and informal educational environments. Green (2002) considers 'Informal music learning practices as sharing few or none of the features of formal music education' and musicians 'pick up' skills and knowledge through their own endeavours by watching and listening to other musicians. Green also reaffirmed that most popular musicians historically found formal music education alienating and difficult to relate to (See Bennett 1980, Berkaak 1999, Cohen 1991, Finnegan 1989, Horn 1984, Lilliestam 1996 and Green 2002).

The literature also provides a basis for the term 'popular electronic musician' which has been broadly defined through the notion that technology, such as the turntable or computer, is central to the interaction, performance and production of popular styles of electronic music such as dance and Hip-hop[2] and, for the purposes of this study, the popular electronic musician has also been further defined by their distinct mode of music-making. A DJ is described as a person who generally selects and performs a series of tracks (termed a set) using records or CDs and creatively navigates through a live set using mixing techniques (Thornton, 1995). A turntablist is described as a person who utilises the same equipment as a DJ (a mixer, headphones and recorded music) but generally requires specially designed Turntables in which to scratch the record (Katz, 2004). The producer has been further categorised into two areas; the Hip-hop[3] style producer and the dance music producer. This distinction was made not because the skills and knowledge required to do so of either producer are vastly different (rather, they are evidently similar) but because the two classifications represent two historical and cultural lineages that directly affect the rationale and methods of production. Dance music production has grown from club culture, in which the performing DJ is at the centre of dissemination, and its intended reception by a club audience provides the focus for musical ingredients (Thornton, 1995). On the other hand Hip-hop style production has developed through turntablism, in which many of the techniques of the turntablist form the basis for arrangement and composition of Hip-hop styles of music in which techniques are used to specifically reference or authenticate the work (Schloss, 2004).

Regardless of category, each popular electronic musician requires specific skills, techniques, musical knowledge of rhythm and structure, and an intimate knowledge of creating tonal colours and timbres through sequencing and arrangement (Fikentscher 2000, Katz 2004, Schloss 2004). This study aims to build upon previous ethnographic studies of popular electronic musicians by investigating the informal learning

---

[2] It is acknowledged that there are numerous categories of music that can be defined in a similar way, and moreover, categories of music that fall under the broad umbrella of these terms. The oversimplification is performed simply for the purposes of this study and ease of comprehension.

[3] The term hip-hop style is used to denote the method of production rather than the specific aesthetic requirements of the genre as other genres, such as UK based 'Grime' utilise similar techniques in the composition and arrangement process.

practices employed in the acquisition of skills and knowledge of a group of popular electronic musicians.

Methodology

Although the main body of the investigation draws upon a series of semi-structured interviews the methodological approach is considered broadly ethnographic as summarised by Sara Cohen:

'An ethnographic approach to popular music…would emphasize that popular music is something created, used and interpreted by different individuals and groups. It is human activity involving social relationships, identities and collective practices…The focus upon people and their musical practices and processes rather than upon structures, texts or products, illuminates the ways in which music is used and the important role that it plays in everyday life and in society generally' (1993, p.127).

The entire study consisted of 54 participants, the majority of which were studying a BSc in Music Technology or a BA in Music Production at Higher Education institutes in the UK, and they identified themselves to the researcher as either a DJ, a turntablist, dance or Hip-hop producer. The age span of participants ranged from 18 years up to 40 years of age and the demographic was mixed, with both male and female participants. A minority of the participants were either professional musicians who DJ regularly, have been involved in electronic music for a significant amount of time or have published material.

The initial phase of the study included all 54 participants who undertook a questionnaire which was distributed electronically to aid collation, analysis and comparison between answers. The questionnaire offered demographic and geographic information, general musical background of the participants, an outline of the participants' musical skills and more specific questions regarding the participants' experience of music pedagogy in formal institutions.

For the second phase of the study, 25 of the initial 54 participants were invited to attend a group session in which they were asked to identify milestones in their

musical development on an A3 size poster. The milestones ranged from the first recording listened to, the first performance attended and the first record purchased, to the first time a new music-making technique was learnt and how the technique was learnt (i.e. whether it was perhaps learnt from a relative, friend or teacher). The musical biography not only helped participants to begin to structure their musical development in both graphical and written form, it also allowed participants to consider the impact of particular musical events on their musical development.

Both the responses from the questionnaire and the information given in the musical biography provided the impetus for the third phase of the study in which 9 of the 25 participants were invited to attend a series of semi-structured, one-to-one interviews. The interviewees were also invited to bring videos or photographs of their performances and rehearsals, which allowed some topics covered in the discussion to be substantiated and further explored. In selecting the 9 interviewees, an attempt was made to capture the spectrum of popular electronic music-making, with each particular strand of music-making represented by at least one of the interviewees. Of the 9 interviewees 3 were DJs, 2 were turntablists, 3 were dance producers and 2 were Hip-hop producers. The age range of the interviewees (18-40 years) also provided an opportunity to explore the learning processes of older musicians in comparison to younger musicians.

Common modes of informal learning

The questionnaires and musical biographies allowed the participants to reflect on their 'beginnings' and how they began learning their respective skills and techniques. The responses from the questionnaires and the biographies indicated two things; firstly, the age at which the participants began composing or performing popular electronic music was notably later than the rock musicians in Green's study as: 'The youngest age at which band formation occurred was 6…but the ages between 12 and 15 were the norm' (2002, p.79).
The age at which the popular electronic musicians in this study began composing or performing was between 16 and 20 years old and through further discussion a number of the participants identified a change in social interests and pursuits facilitated

contact with music production technology and practitioners in their chosen category of music-making. This was illustrated by the following responses:

Andrew 'I suppose I only got into dance music when I was old enough to go to nightclubs'

Richey 'My first experience with dance music was hearing it in night clubs so I would have been about 17…18 and it wasn't until one of my friends bought some decks that I got interested in actually deejaying'

Richard 'At the age of 20 I met a new set of friends started going to decent clubs, like Gatecrashers, Cream, God's kitchen, also my first trip to Ibiza (I've been nearly every year since). We had a good time and it definitely had a major impact on the music that I play and what I still like to listen to'

Secondly, responses in the questionnaires and biographies showed that none of the 54 participants had experienced popular electronic music within formal education as Paul's comment illustrated:

Paul 'There was nothing at all at school in the way of Deejaying equipment and none of the teachers new anything about dance music. My old music teacher used to call it noise..he couldn't figure out why we liked it. It wasn't until I left school that I started to take Deejaying seriously and hanging out with other DJs.'

The semi-structured one-to-one interviews allowed the study to progress beyond the early stages of the musicians' development and explore the process of acquisition of skills and knowledge in some detail. Because the interviews were semi-structured, the interviewees were asked similar questions and as a result common modes of learning practice emerged.

The first common mode of learning practice was that of 'Listening' and the participants displayed an acute awareness that listening formed part of the learning process as shown in the comments below:

Hannah   'When I first started out, all I would do is copy my favourite records…I used to write everything I could hear down on a piece of paper and then spend the next week or so trying to make exactly what I heard…it didn't always work out though *(laughs)* but because Hip-hop is all about sounds, and the way they are used, it taught me to listen to certain sounds within a track'.

Jamie   'When I started producing all I did was listen to the tunes and then try and copy them…I didn't really think about it at the time but copying those tracks gave me the grounding I needed to make my own tracks…that was my practice really'.

Some participants discussed different levels of listening as shown in Jamie's comment:

Jamie   'Oh yes, there's different levels of listening for me, sure…I mean if I'm producing a track and looking for a particular snare drum sound or whatever then that's all I'm listening for in the record but if I'm Deejaying that's completely different. I'm listening to the entire track then and listening to whether it will work in a packed club instead of just on my headphones.'

Jamie's comment indicates an understanding that different listening practices are required for different tasks, and when asked how he had learnt to listen in these ways he replied:

'I read an interview with Dr Dre[4] years ago and he was talking about exactly that…different ways of listening and how he listens to records in samples but then switches to listening to the record as a whole. It

---

[4] Dr Dre is a commercially successful Hip-hop producer and rapper and one of the original members of the Gangsta Rap group N.W.A.

completely changed the way I went about producing from then on. There were also some pearls of wisdom in there about how to grab a sample from a record and I tried it afterwards….it was really helpful.'

Participants also discussed 'active listening' in as much as the specific process of engaging and reacting directly as a result of listening generates a dialectic and dynamic listening process. Active listening is specific to the beat matching process as the recorded material is in constant flux and the rhythms of one or both records are manipulated to create a composite mix and the process requires a cycle of purposive listening and manipulation of the disc until the rhythms of both records are 'matched'. Richard describes this below:

Richard   'Although it's called beat matching, it's not just about syncing the rhythms, it's about blending the records…which may be two entirely different records…and make it sound transition-less. You're able to do that through listening and tweaking, then listening and then tweaking it if it needs more. As you practice, your ears and hands work together without you noticing it.'

The second and most prominent common mode of learning was that of 'solitary practice' in which all of the participants commented on its importance in their development as demonstrated through the following comments:

Paul   'I used to rehearse for something like 7 hours at a time when I started off…I'd spend hours rehearsing one thing over and over again. I learnt how to beat match and mix that way'.

Hannah   'Because you're on your own you don't have any inhibitions and you can try out new things. I used to get Mixmag and read all the interviews with the DJs and try out some of the techniques that they talked about'.

Amir   'I didn't really know how to use the software at first so the first thing I learnt was how to use that. Then, I had to get to grips with sampling

and how to arrange all the samples...and while I'm learning all that I'm trying to make my music sound like all the records and CDs I've listened to, which involved learning to mix and use FX. Pretty much all of that was through working on my own for hours and hours.'

In addition to 'solitary practice' some of the participants discussed setting explicit goals or working to a structured practice regime as shown in the responses below:

Richey   'I was taught the basics [of beat matching] by my brother, then practiced, practiced, practiced to refine the skill and train my ears. I used to set myself a goal of beat matching a 10 minute set, then a 20 minute set and try and increase the amount of time for each set every week.'

Andrew   'Practice is definitely needed if you want to learn to scratch…I've spent hours and hours practicing and its important to be hard on yourself you know, you have to be committed. I used to practice at 4 o'clock every day when I got home from school, I made it part of my routine and that makes you more disciplined…I mean you have to be disciplined. You'd then set yourself little challenges, so by the end of one week or one month, you'd be able to do a reverse on one record or you'll see somebody doing something and you think "I'll have to practice that".

The third common mode of learning practice identified by the participants was that of learning as part of a group, in which the exchange of knowledge or techniques was achieved collectively by meeting with friends. The multi-layered dynamic of a group and the hierarchy of skills within it also contributed to the learning process, which is highlighted in the following statements:

Patrick   'When I was learning to DJ me and my mates used to get together all the time because we only had one pair of decks between us. It also helped because we'd swap records and ideas…I suppose that's how I learnt to DJ really…we'd help each other out or swap ideas which,

11

looking back, really helped…Now it's more of a case of practicing on my own but we still get together every now and then'.

Rebecca　　　'A very good friend of mine, Lionel, was part of our friend group and he'd been Deejaying longer than most of us so we used to look to him for guidance and he used to show us things. But I suppose we were all good at different things too…so I used to share ideas or things I'd heard about…we'd all learn from each other as well…that's one of the reasons why we were all friends, we had that shared interest'.

As an extension of the third mode, the fourth common mode of learning practice that emerged from the interviewees' responses, was that of learning through apprenticeship from a particular individual, typically an older sibling or friend as Jamie illustrated:

Jamie　　　'My brother would set me a Deejaying challenge but first he'd show me what I needed to do and then I'd try. He was also very good at telling me when I wasn't doing it right (*laughs*) which really helped…this went on for a while, maybe two years, by which time I was a competent DJ and I'd show him things I'd picked up from other DJs'.

The fifth common mode of learning practice arose through the commonality in the way in which the participants acquired some their knowledge informally through an assortment of learning materials as shown in the comment below:

Paul　　　'I've spent hours, months and years reading books and studying as there are no courses specific to the genre I am writing and now I regularly use the Internet to access tutorial videos…because of some of the new gear I've got like Traktor and the X1 controller, I watch videos because they let you see what's happening close up… there are some excellent tutorials for setting up FX and tricks.'

The younger participants, however, were more likely to use only one resource for the acquisition of their knowledge: the Internet as described below:

Richard   'The Internet's the only thing I use for all my information really…I use youtube for tutorial videos and I try and keep up with new ideas and see what other DJs are up to by logging onto forums'.

Discussions throughout the one-to-one interviews displayed a conscious awareness of learning throughout the musical development of the participants and in particular when discussing 'solitary practice'; some participants demonstrated strategic learning by setting specific goals and targets. Fundamentally, solitary practice was viewed as a positive and enjoyable experience as it allowed for the development of new ideas and experimentation through the practical synthesis of abstract knowledge. The merging and combining of abstract ideas results in new learning experiences, or 'experiential learning', in which a 'direct encounter with the phenomena being studied rather than merely thinking about the encounter, or only considering the possibility of doing something about it' is experienced. (Borzak 1981, p.9 quoted in Brookfield 1983).

Unlike the rock musicians in Green's study (2002) who frequently experienced peer-directed and group learning by participating in band rehearsals and performance, the popular electronic musicians in this study only experienced these styles of learning during the early stages of their development. Vygotsky (1978) proposed that people learn by collaborating with each other on an interpsychological level when a more experienced individual informs those less informed and, as a result, the other members of the group are then capable of internalising this information intrapsychologically and working independently. The 'more experienced individual' was identified by over half of the participants as an older sibling who for three of the participants later became their tutor or mentor (Hannah, Jamie and Richey). This is described as 'Cognitive apprenticeship' in which a master of a particular skill (in Richey's case beat matching) teaches that skill by providing both practical and mental (cognitive) help and guidance (Collins, Brown & Newman, 1987). Learning through apprenticeship allows the apprentice to ask any pertinent questions, gain immediate feedback and situate the learning process within a specific context.

Solitary practice formed the majority of learning practices throughout the development of popular electronic musicians, with a small amount of collaborative learning or cognitive apprenticeship at the beginning of their development. As the musicians become more competent, solitary practice became the overriding learning practice. However, popular electronic musicians did not stop learning from each other, or from master musicians, as participants expressed their desire to continue to exchange knowledge and ideas through networking at performance events and Internet forums. The sharing of knowledge through social networking is in keeping with the informal nature of popular electronic music production and performance (Rose, 1994). Possibilities for sharing musical knowledge have been expanded through the global networking capabilities of the Internet and local knowledge of musicians can now be made global without the constraints of geographic location. The demographic of the participants, however was significant in highlighting the various ways in which younger and older musicians acquired and shared their knowledge through other mediums. For instance, when making the transition from DJ to dance music production Paul, the eldest of the participants, acquired his knowledge using a broad range of resources whilst the younger participants only used the Internet as their source for learning materials.

'Listening', the first common mode of learning practice that emerged from the interviews, formed the basis for other learning practices (i.e. listening and copying) and popular electronic musicians not only learnt new musical techniques through listening, but also various musical conventions that distinguished popular electronic music from other categories of music. Coupled with the sharing of knowledge and practice between musicians, the social conventions of music-making are learnt; a process of musical enculturation.

Musical enculturation of DJs, turntablists and electronic music producers

Throughout the questionnaires, biographies and interviews all of the 54 participants revealed extensive periods of listening to music and through exposure to music the popular electronic musicians in this study have become efficient listeners and are able

to identify structural patterns within the music; Lilliestam refers to these patterns as "formulas which provide a common musical language" (1996, p.204) Lilliestam's assertions are also confirmed by music psychologists Bigand& Poulin-Charronnat who found 'That there is an initial predisposition of the human brain for music processing that is triggered by the extensive exposition to musical stimuli in everyday life' (2006, p.120). This 'intensive exposure' is termed 'musical enculturation and refers, 'to the acquisition of musical skills and knowledge by the immersion in the everyday music and musical practices of one's social context' (Green, 2002, p.22).

Listening to music forms the basis of musical immersion and contributes to the development of templates for musical form and style, which is transmitted through musical situations of composition or performance (Lilliestam, 1996) and in addition to musical enculturation, the popular electronic musicians in the study have undergone a process of technological enculturation. The physical processes of acquiring, learning, practicing and performing with technologies is comparable to the model of technological enculturation of artifacts into the home (Silverstone, Hirsch and Morley, 1992) in which there are four corresponding stages of enculturation 'Appropriation, Objectification, Incorporation and Conversion' (1992, p.18). These four stages can be attributed to the electronic musicians in this study as they have appropriated their various technologies (records, turntables etc), incorporated them into their music making practices and converted them into cultural artifacts in which they become topics of conversation and are used to form cultural bonds with other musicians and the specific genres of music in which they engage with (Thornton, 1995).

Behind musical enculturation lies the intrinsic motivation of the musician and the desire to engage in music-making which is evident in the hours of solitary practice, the capital investment of equipment and records and a strong intent on making music and sharing ideas and knowledge within a social group without the aid of formal educational structures. The intrinsic motivation of the musician and their focus on music-making creates a virtual imperceptibility that learning is actually taking place which was evident in some of the responses from the popular electronic musicians who until the study, had not considered their musical development as a learning process.

Informal learning practices, musical enculturation and formal education

Through the characterisation of common themes from the participants' responses, four distinct informal learning practices were identified; listening and copying, solitary practice, group learning and apprenticeship. Listening to music was employed both as a learning and social practice in which various techniques were used to analyse and respond to the musical material. Solitary practice formed the bulk of the musicians' learning in which information from listening to music could be assimilated through investigation and experimentation, often with a specific aim or objectives. The learning process throughout is guided by the values of the musical category in which the musicians immerse themselves and over time, the musicians become musically encultured. These informal learning practices used by popular electronic musicians do have implications for musical learning in formal institutions and certain characteristics of informal learning practices may be appropriately integrated into formal education, as described by Davis:

'Formal music education certainly has much to learn from the ways that young people make and learn music informally outside the walls of the classrooms. We need to find ways to bring into formal music learning the ownership, agency, relevance, and means of personal expression that will enable our students to begin to feel as passionate about school music experiences as they do about non-school music experiences' (2005, p.15).

In addition, Lucy Green proposes the integration of the following informal pedagogical practices into formal music education:

(1) Allowing learners to choose the music; (2) learning by listening and copying recordings; (3) learning in friendship groups with minimum adult guidance; (4) learning in personal, often haphazard ways; (5) integrating listening, playing, singing, improvising and composing.

<div align="right">(Green, 2006, p.8)</div>

Introducing or emphasising some of these practices, in particular learning by listening and copying recordings, may help to integrate popular electronic musicians more

sufficiently into formal education[5]. Music technology and music production courses at UK Higher Education institutions may also be further informed through an indication of the skills and knowledge that the popular electronic musician have already developed. In this way music education can build upon musicians' frameworks of knowledge instead of attempting to start from scratch or introduce pedagogical methods that are alien to previous modes of learning. Intrinsic musical enculturation however, is not an entity that can be simply replicated and the immersion of a person into a musical world containing musical practice, culture and interaction with other popular electronic musicians is not something that can be readily copied within a formal institution but utilising popular musicians' musical references can often introduce musical concepts that may have not previously been considered (Davis 2005, Challis 2007) and a broader discussion of music could de-canonise an imposed hierarchy of musical imperatives.

Conclusions

As formal music education choices continue to develop at HE institutions in the UK, particularly in disciplines such as music technology and music production, the inclusion of popular electronic music into its taxonomy of musical study and the pedagogy and acknowledgement of turntablism and deejaying practices, could contribute to a more inclusive representation of popular music-making.

Dedicated practice, extended listening and copying, and motivation form the basis for immersion into the cultural and musical practices of the popular electronic musician and learning takes place informally within a process of enculturation. Some of these learning practices could be appropriately integrated into popular music and music technology pedagogy within formal educational institutions (Davis 2005, Green 2006) and may help in the integration of popular electronic musicians into formal music education through the continuation of informal modes of study, in particular listening and copying recordings.

---

[5] The number of projects attempting to integrate informal learning practices is increasing (Byrne 2005, Byrne and Sheridan 2000, Cope 1998 &1999, Nielsen 2006, Price 2005, 2006 and DfES 2006) as cited in Green 2006.

The study of popular electronic musicians' learning practices forms only part of the wider discourse of popular electronic music pedagogy within formal music education and further reflection is required, not only as to whether informal practices can be incorporated into formal educational institutions, but whether formal institutions are appropriately adapted for popular electronic musical learning to take place. Western Art music pedagogical frameworks have been successfully transferred to rock-based popular music because the study of music theory and composition is combined with instrumental tuition but the musical skills and knowledge required to compose, arrange and perform dance and Hip-hop styles of music do not require the ability to 'play' an instrument in the traditional sense. The popular electronic musician works directly with sound in a tactile fashion, either through the manipulation of a record or a digital audio file; making music in a way the musician playing a musical instrument does not. Formal pedagogical and assessment frameworks would require significant reconsideration and reflection of these elements and additional research into formal institutional structures in conjunction with informal learning practices could further expand the discussion on the inclusion of the practical study of popular electronic categories of music into formal educational institutions.

References and Bibliography

Arnold, Denis (1983). *The New Oxford Companion Music, Volume 1: A-J*. Oxford University Press. p. 111.

Becker, H. (1963) Outsiders: Studies in the Sociology of Deviance. The Free Press. New York

Bigand, E., Poulin-Charronnat, B. (2006) Are we ''experienced listeners''? A review of the musical capacities that do not depend on formal musical training. *Cognition*: 100 (2006) 100–130

Bloom, B. S. (1956). *Taxonomy of educational objectives, handbook 1: Cognitive domain*. New York: Longmans Green.

Boehm, C. (2007) 'The discipline that never was'. Journal for Music, Technology and Education, Vol 1, 2007. *ISSN: 17527066*

Bourdieu, P (1993) *Field of Cultural Production* (Randall Johnson ed), New York: Columbia University Press

Brewster, B., Broughton, F. (1999) 'Last Night a DJ Saved My Life: The History of the Disc Jockey. Headline publishing. London

Brewster, B., Broughton, F. (2011) 'The Record Players: DJ Revolutionaries. Black Cat publishing. London

Brookfield, S. D. (1983) Adult Learning, Adult Education and the Community Milton Keynes Open University Press.

Bruner, J. (1985). Vygotsky: An historical and conceptual perspective. *Culture, communication, and cognition: Vygotskian perspectives*, 21-34. London: Cambridge University Press.

Bryman, A. (2001) Social Research Methods. Oxford University Press. London

Campbell, P (1991) Lessons from the World: A cross-cultural Guide to Music Teaching and Learning. Schirmer Books. New York

Challis, M. (2007), 'The DJ Factor: teaching performance and composition from back to front', in J. Finney and P. Burnard (eds), *Music Education   with Digital Technology*, pp. 112–24, London: Continuum.

Cohen, S. (1991) Rock Culture in Liverpool: Popular Music in the Making. Clarendon

Collins, A., Brown, J. S., & Newman, S. E. (1987). Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics (Technical Report No. 403).

BBN Laboratories, Cambridge, MA. Centre for the Study of Reading, University of Illinois. January, 1987.

Davis, S. G. (2005). "That thing you do!" Compositional processes of a rock band. *International Journal of Education & the Arts, 6*(16).

Draper, P. (2008) 'Music two-point-zero: music, technology and digital independence',*Journal of Music, Technology and Education* 1: 2+3, pp. 137–152,

Ellis, A. L., Wagner, E. D. & Longmire, W. R. (1999). Managing Web-based training: How to keep your program on track and make it successful. Arlington, VA: ASTD Press.

Finnegan, R (1989)*The Hidden Musicians: Music-Making in an English Town*, Cambridge, Cambridge University Press, 1989

Green, L. (2002) how popular musicians learn. Ashgate. London.

Green, L. (2006) Popular music education in and for itself, and for 'other' music: Current research in the classroom. *International Journal of Music Education*, *24*(2), 101–118.

Hallam, S (1998) Instrumental Teaching. Heinmann. Oxford Press. London

Hallam, S., Lamont, A. (2001) Learners: Their characteristics and development in BERA Music Education Review Group. Mapping Music Education Research in the UK. (pp. 9-25). British Educational Research Association. Southwell, Notts.

Hannon, E. E., Trainor, L. J. (2007) Music acquisition: effects of enculturation and formal training on development. *Trends in Cognitive Sciences. Volume 11, Issue 11, November 2007:* 466-472

Hardy, S.B. (1981) 'The woman that never evolved'. Harvard University Press. Cambridge

Heywood, J. (2000) *Assessment in Higher Education.* London and Philadelphia: Jessica Kingsley Publishers.

Hirsch, E., Silverstone, R. (1992) Consuming Technologies: Media and Information in Domestic Spaces. Routledge, London.

Huron, D. (2001) 'Is music an evolutionary adaptation? *Annals of the New York Academy of Sciences* 930:51.

Kolb, D. A. (1984), *Experiential Learning: Experience as the Source of Learning and Development*, Englewood Cliffs, NJ: Prentice-Hall.

Katz, M. (2004) *Capturing Sound: How Technology has Changed Music.* Berkeley and Los Angeles: University of California Press, 2004.

Levitin, D (2008) 'The World in Six Songs: How the musical brain created human nature'.Dutton. USA.

Langlois, T. (1992). Can you feel it? DJs and House Music culture in the UK. *Popular Music,* **11** , pp 229-238

Lilliestam, L. (1996). On playing by ear. *Popular Music,* **15**, pp 195-216

Loman, M. M., Robertson, R. R & Saffran, J. R., (2000) 'Infant memory for musical experiences. *Cognition* 77 (I): B15-B23.

Lull, J (1990): *Inside Family Viewing*. Routledge: London.

Miell, D. and Littleton, K. (2004) 'Collaborative Creativity: Contemporary Perspectives', in Miell, D. and Littleton, K., eds., *Collaborative Creativity*, 1-8. London: Free Association Books.

Neill, B. (2002)Pleasure Beats: Rhythm and the Aesthetics of Current Electronic Music. *Leonardo Music Journal*, Vol. 12, Pleasure (2002), pp. 3-6. MIT Press.

Rose, T.(1994) Black Noise: Rap Music and Black Culture in Contemporary America. Wesleyan. NY, USA.

Rubin, D. C. (1995) Memory in Oral Traditions: *The Cognitive Psychology of Epic, Ballads and Counting out rhymes*. Oxford University Press. New York (p.179)

Söderman and Folkestad (2004) 'How hip-hop musicians learn: strategies in informal creative music making' in *Music Education Research, 6:3, 313-32.*

Solomon, T. 2005. 'Living underground is tough': authenticity and locality in the hip-hop community in Istanbul in *Popular Music* Volume 24/1

Schloss, J., G. (2004) Making Beats: The Art of Sample-based Hip-hop. Wesleyan University Press.

Shulman, L., and Keislar, E. (1966), *Learning by Discovery: A Critical Appraisal.* Chicago: Rand-McNally.

St. John, G. (2004) Rave Culture and Religion. Routledge. New York.

Swanwick, K. (1994) Musical knowledge, Intuition and Analysis in Music Education. Routledge. London.

Thornton, S. (1995) Club Cultures: Music, Media and Subcultural Capital. Polity Press. London.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.). Cambridge, MA: Harvard University Press.

Appendix I - Summary profiles of the musicians

Table 1 shows a brief demographic, the category or categories of musicianship and the main musical activities at the time of the study (2009 -2010).

Name	Age	Category of musician	Main musical activities
Paul	40	DJ and dance producer	Paul currently Deejays regularly at a venue in Liverpool, UK. He has published several self-produced singles through an independent record label.
Richey	27	DJ and dance producer	Richey has deejayed at venues across the Northwest (UK) and has published a number of self-produced singles through an independent record label.
Hannah	22	DJ and Hip-hop producer	Hannah Deejays regularly at venues across Bedfordshire, UK. She also composes and arranges Hip-hop tracks.
Amir	22	Hip-hop producer and rapper	Amir composes and arranges his own Hip-hop productions. He also performs regularly as a rapper at venues across the Northwest (UK).
Andrew	21	DJ and Turntablist	Andrew deejays regularly at techno-house events in Bristol (UK) and performs as a Turntablist in venues across the UK.
Jamie	21	DJ, Turntablist and Hip-hop producer	Jamie is a resident house DJ at a venue in Leeds (UK) and performs as a Turntablist at one-off events across Yorkshire.
Rebecca	21	DJ and dance producer	Rebecca deejays regularly in Huddersfield and Leeds (UK) and produces electro house, techno-house and techno dance music.
Richard	19	DJ	At the beginning of this study Richard had begun deejaying at a venue in Leeds (UK).
Patrick	18	DJ	Patrick deejays regularly at a venue in Norwich (UK).