

# Skills Across the Border: Issues in the Creation of a Distance Learning Music Technology Course

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**ABSTRACT:** *This paper examines issues in the development of a course in music technology as suggested by the author's experience as a member of the multidisciplinary Course Team responsible for the creation of the UK OU course TA225 'The Technology of Music'. This level-2, distance-learning course taught over 9 months utilises a combination of media (printed text, CD-ROMs with various in-house and commercial software packages, DVDs with broadcast materials, Web-based resources, Computer-Mediated Conferencing) and tutorial support to deliver teaching of a variety of topics in music technology. These are organised into three blocks: block 1 provides an introduction to sound and teaches a selection of fundamental principles (acoustics, psychoacoustics and music theory); block 2 focuses on musical instruments (acoustic and electronic); block 3 teaches digital techniques for music recording, processing and storage, and includes some material on topical issues such as copyrights protection. The focus of TA225 is on technology, but the technologies covered are contextualised both in historical and in musical terms, making the course an option for students pursuing technology and arts-based qualifications alike.*

*The UK OU has a tradition of offering high-quality distance learning programmes, including a number of multidisciplinary courses that bring together technology, management and the social sciences, amongst other fields. However, TA225 is a unique initiative due to the nature of its subject area. Both the development of technology for music and the creation of music with this technology often involve skills across the traditional disciplinary divide that polarises art and technology. Indeed, the last two decades have witnessed a motion towards what appears to be the emergence of music technology as an autonomous discipline. The issue remains, however, that both the development and use of technology for musical applications require, albeit with different levels of expertise, knowledge of core topics in engineering, science, and, more recently, IT and computing. Conversely, some measure of musical expertise is also a necessity. This creates a difficult conundrum for course and programme developers aiming at creating learning opportunities that are relevant and exciting for students with widely varying backgrounds and reasons for studying. The multidisciplinary nature of music technology indeed adds an extra dimension to the problem faced by virtually all OU course developers: the lack of formal pre-requisites for acceptance into a course or programme of studies implied in the University's open learning offer. This paper, therefore, examines some of the issues encountered and solutions adopted by the TA225 Course Team during the production process. It discusses the rationale negotiated by the Team to guide decisions on content, pedagogy and assessment, focusing on the crucial question of how to provide support and opportunities to students with potentially very different backgrounds and interests.*

## 1 INTRODUCTION

'Music technology' education in Britain takes place across a multitude of courses in Further and Higher Education, with the subject appearing as either the main specialism or a subsidiary area within wider programmes (e.g. engineering, computer science, music). At the time of writing, a search on the UCAS (the Universities and Colleges Admission Service) <sup>1</sup> system returns hundreds of related courses whose titles suggest underpinning purposes in respect to providing for assumedly wider contextual needs: academic or disciplinary legitimacy; artistic goals; commercial and industrial job roles; to name just a few. These courses/programmes often do not include the expression 'music technology' in their titles, but

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<sup>1</sup> Available online at <http://wwwucas.ac.uk>

the term does appear within the Music Benchmark Statement (QAA, 2002); significantly, 'technology' features prominently in the Music National (school) Curriculum for England (QCA, 1999), albeit predominantly in connection with ICTs only. Broadly speaking, it appears that, in the last two decades, music technology has been progressively gaining strength as a sort of umbrella term for a number of academic and professional practices that, nevertheless, have been conventionally considered as an integral part of other, well-established disciplines such as (audio) engineering or (musical) acoustics.

On the other hand, music-making has traditionally profited from state-of-the-art technologies and contemporary scientific insight: from the Neanderthal flute to the latest software synthesiser controlled by haptic interfaces, from the first music printing technologies to computer-based musical composition systems, music-making devices have, as a rule, exploited the latest developments in science and technology. As Orton (1992) suggests, 'the finest musical instruments throughout history have both reflected and focused the technical capabilities of their time and culture'. Sound-producing mechanisms, albeit limited to a few categories of acoustic mechanisms and, more recently, electronic oscillation, have been refined and exploited in a plethora of musical instruments as well as sound recording, storage, processing and reproduction techniques and devices. Nevertheless, the crucial relationship between music and technology – albeit contextually-located and often tense – is not always clearly acknowledged. This is an issue for the most part overlooked – perhaps strategically – in discourses that polarise the categories 'art' and 'technology'. Indeed, this dichotomy, which supports predominant definitions of the remit and scope of different disciplines and areas of knowledge, has only recently begun to be contested in emerging, critical discourses in music (Théberge, 1997; Orton, *op. cit.*; Wishart, 1992; Taylor, 2001), with occasional recourse to the ancient Greek notion of *technê* (Di Scipio, n.d.). This fragmentation of knowledge and practice creates a paradoxical situation: despite the multiplicity of ways in which music technology can be conceptualised and categorised in disciplinarian terms, both the development *and* the use of technologies for musical applications require, albeit with different levels of expertise, knowledge of core topics traditionally located across disciplinary boundaries.

Crucially, the interdependency between music-making and technology has not been extensively explored in its implications, in particular, to educators treading in this complex area. In this paper I explore some of these implications by examining a particular educational setting that I have personally integrated – the production of the UK Open University course TA225 *The Technology of Music*. I argue that the multidisciplinary character – understood here as a coming together of different disciplines in juxtaposition (Klein, 1990, p. 56) – of this setting both compounds and parallels a problem that already confronts educators located in that setting: the issue of creating interesting and, simultaneously, relevant learning opportunities in agreement with an 'open access' policy. Also, I suggest that the general approach of 'teaching the conflicts' (a paraphrase of Baynham, 2003), the rationale negotiated by the TA225 CT (albeit not articulated, during production, in these terms), capably maps the *multiplicity* of the subject onto ways in which it could be taught. The paper is organised as follows. Section 2 provides a brief overview of the context for this discussion, that is, the UK Open University (UK OU) and its models of Supported Open Learning (SOL) and Course Team (CT) development. Section 3 begins by describing the setting constituted by the coming-together of the multidisciplinary team that produced TA225 and the shape of the course eventually produced; it then moves on to discuss issues raised during the development process, grouping these issues into three broad (and closely related) areas: pre-requisite knowledge; musical repertoire; repertoire of technologies. Finally, section 4 draws together the main issues raised in the preceding sessions. The paper concludes with the suggestion that the development of courses/programmes in music technology is associated with the creation of new discourses that are the outcome of negotiations of existing discourses on music and technology, thus pointing to the crucial role of politics and power in ascertaining the legitimacy and, consequently, survival of these courses/programmes.

## 2 SUPPORTED OPEN LEARNING AND TEAM TEACHING AT THE UK OU

Broadly speaking, distance education comprises a set of methodologies associated, *par excellence*, with mass education. The form of disembodied learning it fosters, a type of learning mediated by text that displaces the relationship between teacher and learner to create a pedagogical relationship assumedly unconstrained by space and time, nonetheless, pre-dates the emergence of mass communication media.

Nipper's (1989) tripartite framework of distance education's development as a succession of three different 'generations' (single medium/correspondence; multimedia; telelearning/IT) supports an understanding that the explosion of distance education as a bona fide option to learners is only partially linked with the advent of mass media. In agreement with Jarvis' (1995, p. 159-162) sociological analysis of distance education, the availability of new media for distance education may be viewed as both providing an ideal breeding ground for and representing contemporary educational and policy discourses based on the notion of widening access (or aimed at championing 'lifelong learning'). Indeed, in the last three decades or so, a plethora of distance education initiatives across the world (c.f. Moore, 1995; Calder & McCollum, 1998; Harry, 1999; Perraton, 2000; Monolescu *et al*, 2004) has exploited different pedagogical and logistic models to provide general educational packages (and associated academic qualifications), deliver vocational training, and contribute to continued professional development programmes, thus, generally contributing to raise the status of distance education to that of a competitor offering real challenges to more traditional forms of training and education (c.f. Calder & McCollum, *op. cit.*). Significantly, distance education appears, at the moment, to both support and be supported on optimistic perspectives on issues surrounding 'globalisation' in education (c.f. Mason, 1998; Haughey, 2000).

The UK OU's own 'brand' of distance education – the SOL model – <sup>2</sup> is consistent with Keegan's (1996, p. 50) widely-accepted conceptualisation of this mode of teaching and learning. The SOL model offers, in addition to especially-prepared course materials presented on a combination of media, student support in terms of a network of services located across 13 regional offices, which share with campus-based units various administrative tasks. Most importantly, UK OU students are assigned a tutor (currently referred to as Associate Lecturer – AL) who provides tailor-made advice and support to a small group of learners (typically 15-25); ALs are, therefore, located 'at the point of delivery'. The work carried out by this category of staff – marking and giving feedback on students' work, running tutorials and generally advising students on academic-related matters – is acknowledged within the Institution as fundamental to learners' progress and, to a large extent, satisfaction. Course materials, on the other hand, are prepared by staff centrally based on the university's campus (with occasional contributions from external consultants). Course production is carried out in CTs consisting of professionals from various areas across the university who cluster around a core of academics. Academics are also responsible for various other tasks required for course presentation (including the creation of continuing and final assessment mechanisms, monitoring ALs' and students' work – a task that needs to be approached statistically, given the numbers of students and, often, ALs, involved in one single course – and, more recently, moderation of online conferences), in addition to administrative and research activities, similar to those of academic staff based at more conventional universities.

Team teaching is, of course, not an idiosyncrasy of distance education, although this style of developing curriculum and creating learning resources has grown into the predominant style in distance education institutions. As part of a study of the CT approach at the UK OU, Chung (2001) reviews existing models of CTs within distance education; it appears that the structure of distance education institutions – and the UK OU is here only one example amongst others – tends to reflect a commonly perceived need to endow course development with a widely-accepted notion of professionalism; conversely, CTs exploit the institutional structure in that this is arranged to provide expert input in various tasks required for course production (e.g., legal advice and support in respect to copyrights issues, graphics design, and software development). CTs occupy a pivotal position and represent a core element of the logistics required for the production and delivery of courses to often substantial numbers of students. Indeed, the UK OU's model of CT was a crucial innovation suggested by the original – and fairly controversial – plans for the establishment of the institution (Planning Committee, 1969). The course development process in its current shape is described, in its various stages, processes, and personnel required, in an online document available internally to staff (OU, *The Course Management Guide*), which outlines the relationships amongst the various areas of the university responsible for the production of a course; interestingly, non-academic, support services are construed as subsidiary to the development process in that this is managed by an academic unit. This tacit drawing of boundaries

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<sup>2</sup> Johnson (2003, pp. 36-45) provides an overview – albeit biased and already surprisingly dated – of the UK OU; the account is, nevertheless, interesting in that it does highlight the university's commitment to an equal opportunities policy.

implies that CTs can be constituted as arenas that highlight administrative, disciplinary and professional divides; they are, thus, sites of debate, contestation and conflict.

As both part and outcome of a process that supported the eventual institutionalisation of the CT (Rumble, 1982), new administrative layers were progressively introduced to manage the growing concerns with costs and, more recently, the University's general orientation towards providing complete programmes of study leading to named qualifications (that is, certificates and degrees qualified in respect to an area of knowledge or professional remit). This move, in itself, has implied the need for a significant change of culture within the organisation, a process currently underway, as courses now appear within broader Programmes which set out specific curricular requirements that courses, grouped together, must meet, as opposed to what had been a course-centred mode of operation. The Institution now appears to be re-thinking and re-defining itself within a wider, business-oriented context in which it is located on an assumedly equal, competitive foot with more conventional institutions. However, what may appear simply as an attempt to equate more clearly the Institution's offers to those of its 'competitors', also seems to be at odds with its stated mission. From the perspective of course development, it may not be easy to reconcile the notion of 'openness' – albeit an idea quite akin to the democratic discourses on education that underpin thinking within and about the UK OU – with requirements in terms of curriculum, for example, that guarantee the external recognition and, consequently, legitimisation, of qualifications (and, by extension, of the Institution itself). Openness – 'as to people, as to places, as to ideas, as to methods' – poses, for educators, theoretical and practical questions alike; in particular, it constitutes a taxing issue for CTs developing courses beyond introductory level.

To focus this discussion, I would like to narrow the notion of 'openness' to the practical implications for educators of the lack of entry pre-requisites, that is, required qualifications and/or previous knowledge. In the following section I would like to examine some of the issues encountered during the TA225 production process, with a view to clarifying the purposes underpinning choices made by the CT during production. In so doing, I will highlight the ways in which the multiplicity of the production setting and the course reflect the multiplicity that characterises the subject area itself.

### **3 CREATING THE COURSE: ISSUES, DEBATES AND ATTEMPTED SOLUTIONS**

It was within the convoluted scenario of *change* sketched above that the course TA225 *The Technology of Music* was proposed and developed. The fact that an initial proposal was informally circulated in the mid-1990s, but a course team assembled only by 2001, points to the difficulties in carrying out what has been construed, from its early stages, as an 'ambitious project'. The course was proposed as a collaboration between the Faculties of Technology (which would assume the management responsibilities) and Arts, but located within the remit of the General Engineering Programme. Nevertheless, in practice, the main implication of this association was budgetary (partially because the structure of the Faculty of Technology, which houses the Programme, is currently under review). At this stage, the course has the status of elective within different named qualifications, including music. In reality, the academic core of the CT included members from across three different faculties (Technology, Arts and Science), associated with the disciplines of electronics engineering, ICTs, manufacturing technology, music and physics, and the course was both planned and developed according to the UK OU's traditional course-centred rationale spawned by the original focus of the university on 'new and interdisciplinary subjects' (Planning Committed, 1969). In addition, the CT has counted on the professional input of non-academic personnel based on various support units within the university; this staff included an editor, a graphics designer, software engineers, marketing specialists, Rights Department staff, and broadcast production personnel. Administrative support was provided by a secretary, a course manager (responsible for the daily running of course production and, subsequently, presentation), a production manager (responsible for coordinating the production process as a whole), and faculty administration representatives (from Arts and Technology). At the time of writing of this paper, the course is in its first month of presentation under the supervision of a few CT members based at the Faculty of Technology. At this early stage of presentation it is not possible to say much in respect to the course's effectiveness in delivering its proposed outcomes; significantly, however, the course has opened its first year with a healthy student cohort of approximately 600 learners, despite some earlier controversy surrounding the possible appeal (or not) of the course to the UK OU's student 'market'.

### 3.1 Overview of course components

Following a relatively long period of discussions and negotiations, the CT agreed on a tripartite structure for the course: a first block covers the ‘basics’ (in acoustics, psychoacoustics and music theory); a second block covers musical instruments (including voice and electronic instruments); a third block focuses on sound recording and processing, with particular focus on desktop sound processing and MIDI (and some coverage of topical issues such as copyrights). A number of proposals were tabled that outlined ways in which each block could be developed, and an initial specification was drawn, following general University guidelines and templates, and submitted to the various levels of administration involved in course approval. Whilst the approval process was underway, the CT proceeded with detailing the content and supporting media. In terms of media, the CT settled on a relatively ‘traditional’ arrangement using printed text (two bindings per Block) as the main medium for the delivery of content. The requirement for audio CDs (one for each Block) containing sounds and musical examples arose out of discussions on learning outcomes in the area of listening skills. Learning outcomes also include a number of practical skills in ICT and, more specifically, sound processing, suggesting the need for software packages developed in-house (tailor-made animations, simulations, and interactive packages), a sound editor (Adobe Audition this year, with an end-of-presentation review already planned) and a software studio package (Cubasis VST 4.0), delivered in various CD-ROMs associated with the different blocks. Also with a view to providing support to the development of practical skills, the team decided to assemble a home experiment kit (HEK) including a microphone, a pair of headphones, and various small items (a recorder, tubes of various sizes, a drinking straw), the latter to support, specifically, the study of acoustic instruments. The package of materials sent to students includes also a set of DVDs containing 3 tailor-made programmes (collections of sequences, fully integrated with the other materials, produced following a selection from amongst proposals put forward by members of the CT), and a selection of broadcast materials chosen from the BBC archives assembled as a ‘library’ to support, in particular, the study of electronic instruments.

Although the focus of the course is on the technologies, these are generally contextualised in historical and musical terms across most of the course text. The CT, however, agreed on not imposing on all text any single rationale for providing contextual information, leaving individual authors to decide how (and if at all) to incorporate details on people, places and times associated with the topics taught. Contextualisation was indeed assumed as an important ingredient to provide interest and motivation to Arts-based students, in particular, although, as in other areas of debate, the notions of ‘context’ and ‘history’ appeared to be construed in very different ways by different members of the team. The main element informing authors’ decisions was the assumed relevance of this sort of detail/structure vis-à-vis the constraints imposed on each part of the course in terms of study time implications for students. Consequently, some chapters (particularly the introductory chapters in block 1, which deal with basic notions in acoustics and tonal music theory) have little or no contextual information, whilst others are framed ‘historically’; most of the chapters in block 2 present contextual details in boxes (often containing mention of musical illustrations in respect to style, composers, examples of pieces), and all chapters include a number of listening activities. Naturally, in a course as broad as TA225, listening activities appear associated with a wide variety of purposes, including demonstrating basic psychoacoustical phenomena (e.g. beating, masking and examples of auditory illusions), supporting the development of listening skills (e.g. identifying musical instruments, identifying features of sound, assessing the balance of a mix or the quality of a recording), and, generally, developing skills that are fundamental to sound recording and processing. Creating such activities was not always easy given the various constraints within which the CT had to operate. In particular, as discussed below, there were severe restrictions regarding the use of musical notation, which is the usual visual basis upon which comparisons and, generally, commentary on sound/music, are based. This issue was partially resolved by resorting to alternative graphical representations and step-by-step interactive simulations.

Another observation in respect to the course’s emphasis on technologies is that a ‘creative’ element – understood in terms of applying the skills and techniques taught for compositional purposes – is absent. The course teaches the principles upon which the operation of musical instruments and technologies is based, providing a fairly limited picture of the many contexts associated with those technologies. In other words, the course is relevant to listeners and performers in that it may, in principle, inform their practices

(professional and ‘amateur’ alike), and it is potentially of interest to music teachers who may wish to develop their ICT skills with a view to making changes to their school practice. However, the course cannot fulfil the role of many other ‘creative music technology’ courses/programmes in the UK that teach, specifically, compositional thinking associated with the technologies they explore. This may be viewed as a significant weakness of TA225 in its current shape, which might not have been the case if the CT had counted on the contribution of composers. However, as I suggested above, this is a whole new area of endeavour for the UK OU, and it remains to be seen if and how it will develop in the future (one issue of relevance might be the existence of a strong research group on musical acoustics based at the institution, which might suggest further development in the area of instrument manufacture, for example).

In addition to the materials described above, direct student support is provided by ALs within the SOL framework, including, as usual at the UK OU, a number of face-to-face tutorials organised regionally. Online support (along the lines of several current OU offers following the innovative T171 *You, your computer and the net* – c.f. Weller, 2000; 2002) is being offered, for this presentation, on an informal basis as a probe. A number of conferences using the University’s electronic conferencing system (FirstClass) have been created, one specifically for peer support amongst tutors (supported by the CT), and three bundled conferences for students (a ‘Café’ for informal chat; a ‘Course discussion’ and ‘Course Assessment’ for self-help amongst students), the latter overviewed by the CT but primarily controlled by course manager. Some requests have been forwarded to the CT regarding the use of private tutor-group conferences (significantly, a number of tutors have been, so far, providing online support to students via the students conferences themselves), which has suggested the need for an end-of-presentation review of the current arrangement with a view to considering the provision, in subsequent years, of a structured layout for online support, if the review suggests that a face-to-face/online migration (or mixture) is appropriate (which would have several logistic implications, including the area of staff training and development in respect to online teaching skills). Another area for review is the medium for the submission of assignments. The UK OU has deployed a system developed in-house for online submission via a password-protected Web page, complemented by a page accessed by ALs, equally password-protected, which, however, is not being used in the first year of TA225. Finally, a password-protected Web site contains electronic versions (pdf) of the printed text as well as a number of resources, including also links to relevant external sites; this is a compulsory element of the course in that it includes a ‘news’ area that acts as a vehicle for the delivery of notice board information (e.g. errata) quickly and directly by the presentation team. So far, students’ comments have been mostly positive, although, significantly, they appear to mirror some of the issues raised within the production setting, which I would now like to explore.

For the ensuing discussion, I would like to group issues in three general areas, as follows: (a) background knowledge; (b) musical repertoire (range of musical examples included); (c) repertoire of technologies (range of technologies included). In using these categories to frame my discussion, I am implying that the course development was primarily guided by decisions on content. The CT indeed used, both in planning and developing the course, a learning outcomes framework based on QAAHE recommendations,<sup>3</sup> which split learning outcomes into various categories (knowledge and understanding; cognitive skills; practical and professional skills; key skills – the latter include, at the UK OU, six categories, namely, communication, IT, working with others, problem solving, improving own learning and performance, application of number, and information literacy). However, the framework was adapted to provide a model quite similar to the ‘aims and objectives’ approach traditionally used at the institution. In practice, despite the variety of categories entailed in the model, the focus was on knowledge (hence, content) and, to a lesser extent, practical and professional skills. Internal, institutional perceptions of the project as ‘ambitious’, as noted above, may have contributed to this situation; given that ‘music technology’ was an area in which the institution had not previously ventured, concerns with the ‘credibility’ or ‘legitimacy’ of the course in academic terms compounded those concerns with the appeal of the course to students, which I noted above. On the other hand, the conflation of views on what ‘music technology’ as a subject entails – or should entail – may have been a significant factor impacting on procedures involved in the development of TA225. The institutional location of the development process

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<sup>3</sup> Quality Assurance Agency for Higher Education, online at <http://www.qaa.ac.uk>

has clearly had an enormous impact on the course eventually produced, which supports the notion that curriculum ‘reflects cultural beliefs – folk traditions – as well as social and political values and organization’ (Joseph *et al.*, 2000, p.19).

### 3.2 Background knowledge: what do students need to know at the start of the course?

Controversy in this area revolved around two general issues brought to the fore by CT members’ upon reflection on their previous experiences. On the one hand, there was the question, raised by Technology-based members, of how to deliver (and if at all) the potential ‘mathematical’ content of the course (I am using quotes here to highlight that the meaning of the term in this context is not necessarily precise; indeed, students’ discourses often construe simple algebraic operations as ‘mathematics’, and this has already been brought to light in a long thread on ‘maffs’ that emerged in the students’ Café conference). This question was particularly relevant to the portions of the course dealing with topics in acoustics. The concept of ‘decibels’, for example, raised intense debate in that it is a key term in the audio technology vernacular, but one which implies, nevertheless, the need for a fairly sophisticated type of conceptual ‘move’: that involved in construing meanings based on mathematical modelling, a fundamental skill in engineering and science. Epistemologically, the issue here is that of representation, of acknowledging that ‘the map is not the territory’ (as Gregory Bateson puts it in Bateson, 1980 p. 32) whilst exploring the implications of the relationship established between them. On the other hand, Arts-based staff described their experiences in running ‘purely musical’ courses at the level of TA225; for example, an understanding of staff notation in respect to time signatures is a learning outcome of the core level-2 UK OU music course, highlighting the problem of outlining what type of musical background knowledge should (or could) be assumed, as opposed to what TA225 should (or could) potentially teach. Significantly, the issue of representation noted above becomes apparent also in musical thinking when notation is approached from a broader, epistemological perspective. The question of identity of the author emerges here significantly, suggesting that the CT itself mirrored, generally, the potential variety of students’ backgrounds in that members’ experiences and perspectives of the connection music-technology varied dramatically, as did their fluency in each other’s specialist vernacular. Indeed, the chapter on ‘music representation’ included in the third block aims, essentially, at providing a preamble to MIDI coding and digital storage formats by locating them in some sort of historical continuity, whilst materials on contemporary issues of relevance to musicians (e.g. the advent of alternative, at times composer-specific, notation systems from the 1960s onwards, and the emergence of compositional methods that are not mediated by widely agreed-upon notational systems) were not included, despite their having integrated the original outline of the chapter, proposed by a member who eventually withdrew from the project. The encounter of these experiences and perspectives, thus, intensified intra-disciplinary debates by suggesting a further avenue for questioning: would arts-based students be able to cope with ‘the maths’? Would technology-based students be able to cope with ‘the music bits’? What types of resources would be required to support students in their developing of skills across the borders?

Clearly these issues are not totally idiosyncratic to educational enterprises in music technology; they are, indeed, the types of questions that would need to be asked in the development of any course above introductory level with an open entry policy. In TA225, however, the problems were compounded by likely differences between perceptions of technology-based students, on the one hand, and those of arts-based students, on the other hand (although the course might clearly appeal to a variety of learners located in different disciplines or studying, simply, for leisure, without specific disciplinary allegiances).<sup>4</sup> One solution adopted by the CT was to include teaching material on some topics whilst marking them clearly as non-assessable. This carries with it the potential of students simply bypassing these topics. Indeed, institutional discourses construe student behaviour as often ‘strategic’, that is, guided by what they perceive to be assessment requirements as identified in assignments (always provided together with the

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<sup>4</sup> These assumptions, albeit grounded on the members’ experiences (extensive for a number of CT members, but also relevant to more junior staff as such assumptions appear, to a certain extent, to be ‘ingrained’ in internal, institutional discourses on students’ profiles), seem to me crucial but, significantly, potentially harmful to the development process. Given the current rate at which the institution and its ‘market’ appear to be changing, it would be potentially damaging to use such assumptions as the only source informing CTs on the potential audience of the courses we produce. The fact that some of the CT members also operate ‘at the point of delivery’ as ALs or in some other capacity somewhat alleviates the problem.

teaching materials to which they pertain); this assumption seems to be corroborated by studies in student use of media based on surveys conducted with students at the end of their participation in a course (e.g. Kirkwood, 2003). A number of points were considered essential (e.g. the relationship between frequency and period of a waveform, the ability to perform calculations with powers of 10, naming notes and relating these to staff notation, to name just a few) and, therefore, covered in the main text materials (on occasion in boxes) but included in a Reference Manual that students will be allowed to take with them to the final (unseen) exam. This means, in practice, that assessment needs to be entirely distinct from any style of questioning that resembles direct, simplistic applications of mathematical formulae, for example. The Reference Manual is, indeed, sectioned to include also material pertaining to basic musical terminology and the software packages provided in the course: in its conflation of diverse elements, the manual too reflects variety.

### **3.3 Musical repertoire: what music should be included in the course?**

Viewed as a unit, the CT possessed considerable breadth (and depth) of knowledge in terms of a variety of musical genres and styles, but tonality was the prevalent musical model and the source of most of the musical examples selected for the course. Indeed, many of the concepts proposed as ‘fundamentals’ (for example, consonance/dissonance) were much negotiated from perspectives that, predominantly, either simply described or attempted to explicate the concepts in terms of harmonic/numerical relationships. There was, significantly, considerable tension surrounding issues that have fostered alternative theorisation and/or common-sense understandings, for example, in biological terms (as if anatomically/physiologically ‘hard-wired’), in cognitive psychological terms (schemata that can be acquired or ‘programmed’), or in constructionist terms (discourses and social interaction construing epistemologies, identities and realities). The topic consonance/dissonance, in particular, appears twice at different stages of the course, reflecting a polarisation of positions within the CT. On the other hand, and most importantly, this recurrence also points to the CT’s general approach of allowing for multiplicity of views: given the variety of irreconcilable conflicts that confronted the team, the idea of ‘agreeing to disagree’ was eventually adopted, although it was not really verbalised in these terms. In respect to consonance and dissonance, specifically, in the first appearance the approach is prescriptive, that is, the notions of consonance and dissonance are directly associated with musical intervals explicated in terms of numeric relationships and in connection with the harmonic series. In its second appearance, a constructionist, more descriptive, approach supports the location of the concepts in disciplinary, historical and musical terms. It remains to be seen, nonetheless, how students will deal with the CT’s choice to allow such debates to be brought to the fore. It appears, indeed, that a ‘teach the conflicts’ rationale (Baynham, *op. cit.*) eventually permeates the materials: an appropriate analogy for the negotiation process on this matter, however, is with that of an emergent property of a complex system, since this rationale was neither articulated nor discussed beyond the unspoken tactic of ‘agreeing to disagree’ that eventually characterised production. If ‘consensus forms the basis of a team development model’, as Moore & Kearsley (1996, p. 105) suggests, that was the form ultimately negotiated by the TA225 CT.

One other fundamental observation here is that the different approaches to the consonance/dissonance debate, for example, are associated with different views of music and, in pragmatic terms, with choices of repertoire to be included in listening exercises. This is also true of other dichotomies brought into the materials (e.g. noise vs. musical sound). The second approach above, in particular, affords the inclusion of post-1950s Western ‘art’ styles often perceived as exclusionary (often by musicians themselves), which fostered fairly strong reactions from some CT members. Despite that (and the focus on tonality), the variety of CT members’ backgrounds and experiences with music has contributed to an arguably richer collection of musics represented in the course than might be possible in other settings. Examples provided on CD consist of excerpts and complete pieces alike, including, in addition to exemplars selected from the Western ‘art canon’, jazz, ‘pop’, various styles of electronic/electroacoustic music (*musique concrète*, *Elektronische Musik*, acousmatic music, electronica), world musics, to name a few. In a setting in which developers/educators were more closely grouped (e.g. in a music department with a tradition in a given musical style, say, electroacoustic composition or, perhaps, in a computer science department with a group working on computational musicology), such variety might not be possible. On the other hand, as discussed below, choices of musical repertoire are



closely linked with choices of the musical technologies themselves. As I suggested earlier, musical styles and musical instrumentation are closely connected, implying that choosing musical examples defines a given universe of relevant musical technologies, in the same way that choosing musical technologies outlines, to a large extent, a given musical universe and, consequently, implies a given view of *music itself*.

### 3.4 Repertoire of technologies: what technologies do students need to learn about?

There was some debate on the possible perception of TA225 as a course focusing on digital and computer-based technologies. This was neither intended nor wanted, partially because the course was predetermined, from early in its planning, to contain a considerable contribution focusing on acoustic instruments, their underlying principles and manufacturing techniques. Interestingly, despite the vastness of the area, which includes instruments located in cultures outside the Western European tradition, there was relatively little debate on the selection of particular instruments to be covered in detail, mentioned in passing, or simply omitted from the course. On the other hand, the area of electronic instruments created much dispute, partially in connection with selecting what would be effectively included (e.g., from the so-called ‘precursors’, the Telharmonium was included amongst a wide variety of equally interesting candidates), but, most importantly, in connection with latest developments in electronic instrument technology that have fostered a re-evaluation of what a musical instrument may eventually be (or become). The suggestion that the tape recorder, for example, is a musical instrument in its own right (in association, at least, with a particular musical style, *musique concrète*, which has a strong connection with contemporary turntablism), was overwhelmingly rejected to favour a categorisation of the device as a ‘recording technology’. Another topic that generated particular debate was sound synthesis. The literature on sound synthesis does not offer a widely accepted taxonomy for existing methods (c.f. Roads, 1996; Miranda, 2002 – in fact, this is also the case with electronic instruments), and, indeed, in some texts, it is the distinction analogue/digital that provides a framework for organising these methods. This, in itself, implied the need for ‘executive decisions’ on the CT’s part, but these were not made any easier given the relatively widespread association between synthesis and keyboard-based synthesisers and samplers. Indeed, the prominence of the chapter on electronic instruments was severely altered during the discussion of its first draft,<sup>5</sup> when the final distribution of topics begun to be clarified (e.g. samplers might have been included in the third block, but are covered together with electronic instruments). The chapter, eventually, was constituted as a potentially crucial element of the course in respect to students’ expectations, although MIDI and desktop processing (two areas of particular relevance in the CT’s assumptions on students’ requirements) are covered in the subsequent block.

This apparently arbitrary assigning of category membership to different technologies suggests a fairly fundamental question: in what ways is TA225 a course on ‘the technology of music’ rather than ‘music technology’? In other words, does the expression ‘music technology’ differ significantly from ‘the technology of music’? As I suggested above, the terms ‘music’ and ‘technology’ appear, in different combinations, in various policy documents as well as in the vernacular of musicians and technologists in ways that suggest, if not totally opposed, at least contrasting notions of the relationship between music and technology. Considering, in addition, the possibility that ‘music technology’ might be viewed as an area linked, exclusively, with digital and computer-based technologies, as I also noted above, it is fair to suspect that choosing between the expressions above is not merely a semantic move. Selecting musical examples and exemplars of technology entailed in an underlying conceptualisation of ‘music technology’ implies a more essential epistemic move: assessing the terms ‘musical’ and ‘technological’ in their appropriateness to a given situation (e.g. instruments, sounds, discourses). As noted above, choices of musical examples are inherently linked with choices of technologies, that is, essentially, they reveal some form of agreement on what ‘music’ is to be represented. This is not a tautology, but, indeed, a logical

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<sup>5</sup> Course development at the UK OU includes 3 stages of drafting (interspersed with CT-wide discussions) and a final stage of preparing a ‘handover’ version of the chapter, which is then passed on to the editor, who also coordinates the various areas involved in preparing the complete set of materials associated with the chapter text (e.g., illustrations – either bought in via the Rights department or prepared in the design studio – and sound examples – sometimes prepared by authors but produced, in their final form, by professional personnel).

statement of profound significance to curriculum development that is consistent with the view put forward earlier which locates curriculum in culture.

#### 4 CONCLUSION

Relatively of late, there has been an unprecedented dissemination of both music as a product and music-making as an activity, enabled, amongst a plethora of other aspects, by the emergence of new media for the production, storage and distribution of music, and crucially, the relative decrease in the cost of electronic musical equipment. Diversifying educational offers in the area appears an attractive option, partially due to the magnitude of the industries involved, but also due to the extent to which music, in one way or another, tends to be part of most people's lives. However, without the recognition of the potentials and limitations of academic discourses to convey wider, cultural meanings, the recent proliferation of music technology courses might be easily construed as pure opportunism. Academic discourses – albeit multiple and, often, mutually-excluding – may provide inadequate vehicles for the articulation of what constitutes, at times, lifestyles totally alien to those discourses.

In summary, in this paper I provided an account that highlights the ways in which the multiplicity of the subject area is reflected both in the course development process and the course materials themselves. This 'mapping' of multiplicity brought to the fore a fairly broad range of questions concerning music technology education: many of these questions remained unanswered, and, certainly, many others are left unasked due to the limitations of space and, naturally, of my own experience and understanding. One crucial issue I implied, nonetheless, is that, the coming-together of specialists in different areas does not guarantee the existence of a common language for the negotiations involved: the ability to identify (or, perhaps, construe) links across disciplinary borders does not pertain to a multidisciplinary encounter, a mere conflation of methods, approaches and languages. This is all the more obvious vis-à-vis contextual factors such as disciplinary, professional and institutional allegiances. I do wonder if, perhaps, the main question that should be considered by development teams is not how students with different backgrounds will be able to cope with skills across borders, but how the team members themselves can do so in the first place.

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