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Using spatial sound as an interdisciplinary teaching tool

ABSTRACT

'Interdisciplinarity' has become an ambiguous and slightly misleading term; people appear to have quite different ideas of what it means. One topic that is shared among various art disciplines and is believed to help relating to and understanding practical interdisciplinary features of an artwork is the role of the physical space. This article examines the role that spatial sound can play as a teaching enhancement tool exemplified in successful examples of interdisciplinary students' collaborations. Challenges of an integrated interdisciplinary curriculum design for art courses are discussed taking into account relevant issues like contents, assessment and resources.

KEYWORDS

music technology
interdisciplinarity
performance
collaborative learning
curriculum design
employability

INTRODUCTION

The recent expansion of the Lancaster Institute for the Contemporary Arts (LICA) integrating disciplines like Film Studies has had an impact on the teaching curricula of courses that had to be adapted in order to accommodate the needs of a larger and more diverse range of students. This process has generated an interesting discussion among colleagues across disciplines in LICA about the need to develop more inclusive modules following a more interdisciplinary teaching approach. Since its creation in 2005, LICA has been driven by the idea that most teaching at undergraduate level in the department should be conceived as a well-balanced mix of theory and practice. The common aim of all LICA undergraduate programmes is 'to create graduates that are informed practitioners, that is, graduates that not only create resonant

works, but are also able to understand their practice critically, conceptually and historically and work independently and collaboratively' (LICA 2012a). The importance of developing independent, collaborative or interdisciplinary work is outlined as one of the important features of LICA's educational strategy and is currently one the main goals behind the development of a new departmental curriculum. Practice-based modules that encourage the possibility of collaborations among students from different disciplines are the basis of the new integrated curriculum and are actively encouraged across the department. Inspired by these recent developments within LICA, this article discusses various aspects of interdisciplinary teaching taking as a starting point the idea of using spatial sound as an effective tool to enhance student collaborations across disciplines. The text also outlines ideas for the design and implementation of an inclusive and flexible interdisciplinary curriculum within the arts.

INTERDISCIPLINARY TEACHING

One of the main challenges of putting into practice ideas related to interdisciplinarity is that people normally have very different ideas of what it means in practical terms. As mentioned by Wassertstrom, interdisciplinarity has become a 'fuzzy' and sometimes misleading term (Repko 2007: 131). This is due to the fact that people have different views and ideas of what interdisciplinarity is and how it should be put into practice. An interesting definition of interdisciplinary is offered by Klein and Newell:

> Interdisciplinary studies may be defined as a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline and profession. … and draws on disciplinary perspectives and integrates their insights to produce a more comprehensive perspective.
>
> (Repko 2007: 132)

Considering this definition, it is important to try to understand the approach to the interdisciplinary curriculum design as one that tries to integrate the knowledge of different disciplines and not a multidisciplinary approach where there is a juxtaposition of several disciplines based on one problem with no direct attempt to integrate them (Hayes Jacobs 1998: 6). The use of multidisciplinary approaches to research and teaching projects has been called *false interdisciplinarity* by Miller (Lattuca 2001: 115) due to the fact that in this case there is only a 'simple act of juxtaposition of several disciplines with no systematic attempt at integration or combination'. In the context of art practice-based courses the confusion between interdisciplinary and multidisciplinary approaches is common and leads to misleading arguments about the real nature of an interdisciplinary approach and teaching strategies. This might be due to the fact that usually the multidisciplinary methods are perceived as a safer approach because they allow teachers and students to work within a well-known limited framework with no real need to engage with problems and ideas that can involve other disciplines, discouraging students to bring different kinds of perspectives together (Toohey 1999: 48–50). Admission interviews with candidates within LICA in recent years have also shown that most university candidates are still interested in obtaining degrees in specific traditional subjects like music, theatre or fine arts but at the same time are

also very keen in gaining experience within other related art disciplines (LICA 2012b). It is therefore important at this stage to consider the aspects that an inclusive interdisciplinary curriculum design should include in order to maintain the balance between the individual identity of disciplines and their relationship in teaching strategies. The idea of an interdisciplinary curriculum design proposed by A. Repko (2007: 132) deals with some of these issues and also relates to the core elements of interdisciplinarity mentioned above:

- Addressing a complex problem or focus question that cannot be resolved by using a single disciplinary approach
- Drawing on insight generated by disciplines, interdisciplines or schools of thought, including non-disciplinary knowledge formations
- Integrating insights and
- Producing an interdisciplinary understanding of the problem or question.

Repko's approach aims to create an inclusive teaching framework where disciplines can interact and blend without losing their characteristic features. In the following sections examples of collaborations across disciplines and teaching projects will be discussed taking as a starting point one of the most simple and common features of most artworks: the use of the physical space.

EXPLORING THE PHYSICAL SPACE

The current section describes two collaborative projects carried out by the author that inspired and shaped some of the ideas of the teaching projects that will be discussed in the next section.

In the first project, ideas about interdisciplinary were discussed and they were applied in a performance environment. It was a dance project that was carried out with the choreographer Daliah Touré at the Northern School of Contemporary Dance (NSCD) in Leeds, England. The goal of the project was to obtain an insight into the creative ideas that are shared by choreographers and composers by developing a devised dance piece, using various interdisciplinary approaches that were explored through a series of workshops. By working closely with the choreographer and the dancers as they developed the workshop exercises, it soon became clear that using the physical space as an overall theme for the collaboration would help the practitioners from dance and music backgrounds to communicate and develop ideas using approaches related to creative processes in both disciplines (Tufnell and Crickmay 2001: 182). Following a similar method to the one used by P. Hellwege in projects with students from different backgrounds (1993: 26), several visual aids were used to relate artistic concepts with specific features of the two disciplines. Drawings, pictures and diagrams were used in the early stages of the collaboration to exemplify the interdisciplinary features of the project, allowing participants to explore a wide range of links between the choreography and the music for the devised piece. Using this method, several simple spatial relationships between the dancers' movements and the spatialization of sounds in the piece were developed to create the first drafts of the dance piece. Table 1 shows some of the spatial relationships between the choreography and the music explored in different sections of the devised piece, which resulted from the project. As it can be seen on the table, in some sections of the piece, the spatial developments in the dance and the music are directly related, while in others these relationships are less obvious and subtle.

The devised piece, resulting from the collaboration, exceeded expectations and was perceived as a very successful enterprise among staff and students at the NSCD. The idea behind the project has since been used at NSCD as a template for collaboration projects with students from other disciplines such as film, music and visual arts.

The second collaboration where interdisciplinary ideas related to performance were tried out was a dance-theatre project carried out by the author in collaboration with two dancers and two singers. This project involved working with texts and recordings from a radio play to devise and implement a dance theatre piece for the 2007 Edinburgh Fringe Festival (Otondo 2007). The motivation behind the project was to expand on the idea of using the physical space as a simple and effective way of framing collaborations between performers with different backgrounds and also exploring ways of integrating the use of the human voice and mobile sound in dance performance. In order to develop some of these ideas, a flexible performance approach was conceived that tried to emphasize the role of the performers as the natural embodiment of the relationship between movement and sound onstage. This idea was implemented by creating a performance framework that relied mostly on an ambitious sound design that was created by combining sounds of hand-held radios that are carried by performers onstage with sounds from the PA system in the venue. This simple, but flexible audio setup allowed the possibility of developing various types of spatial relationships onstage by freely combining the performers' movements, the sound of their voices and specific sound materials reproduced through the portable radios. The adaptability of the setup also allowed the possibility of a more direct involvement of the performers in the conception and implementation of the various stages of the devised piece. This was inspired by the idea that sounds could be integrated organically within the choreography of a piece by combining specific sounds with the performers' actions onstage, as exemplified by P. Barker with music performers onstage (Bicât and Baldwin in Barker 2002). Table 2 shows some of the spatial relationships that were explored in the different sections of the dance-theatre piece, as performed at the 2007 Edinburgh Fringe Festival. As shown in the Table, the relation between the movement and sonic material in the piece is diverse and it is strengthened by the use of portable radios. By using these subtle and contrasting spatial relationships simple, but powerful audio-visual associations were developed by allowing the possibility of

Dance	**Music**
Stage mapping involving performers' movements on the edges of the performance area	Slow movement of long continuous sounds using panning
Gentle movements of performers on specific positions onstage	Variations of depth and perspective of impulsive sounds using the convolution
Absence of movement: performers remain still on specific locations across the stage	Abrupt movements of percussive sounds across the stereo field using panning
Repetitive sharp movements of a single performer at central position on the stage	Subtle horizontal movements following dramatic dynamic variations

Table 1: Examples of spatial relationships between the dance and the music explored in the devised piece created for the project.

Performers' movements	Spatial sound design
Two performers remain in one position while the other two move slowly across the stage with portable radios	A combination of various sounds: delivered speech, moving sound sources (hand-held radios) and sounds played through the venue's PA system
All four performers remain still, aligned facing the audience	Delivered speech synchronized with sounds coming from radios held by performers
Two performers dance using the whole performance area	Gentle stereo mix played through the main PA system
Fast movements of performers across the stage	Performers deliver speech while moving across the stage. Speech is synchronized with a stereo mix played through the main PA system

Table 2: Examples of the spatial design in different sections of the devised piece To have done with the judgment of Artaud, *as presented by Base Theatre at the 2007 Edinburgh Fringe Festival.*

coordination between speech sounds with performers' movements inside and outside the performance area. As one reviewer of the show pointed out, this made the work more original and helped the performers to create the appropriate atmosphere by organically blending movements with sounds in subtle but effective ways (Powell 2007). The piece performed at the Edinburgh Fringe Festival was well received by audiences and allowed the artists, who were involved in the project, to further develop some of the ideas mentioned above in their own solo performance projects later.

SPATIAL SOUND AS AN INTERDISCIPLINARY TEACHING TOOL

Following the relative success of the two projects mentioned above, the challenge was to assess if some of the interdisciplinary ideas that inspired the collaborations mentioned above could be implemented in a teaching project with students from different arts disciplines at Lancaster University. The scope of this teaching project was based on M. d. S. G. Ferreira's idea of using music technology as a framework that allows students from various backgrounds to develop projects related to a number of different professional practices (2007: 23–31). Figure 1 shows examples of some interdisciplinary features of music technology that were used to frame teaching projects at the Lancaster University.

The main goal of the project was to give students from different artistic backgrounds the possibility of collaborating across disciplines in order to develop interdisciplinary works that would explore the role of spatial sound in different kinds of artistic scenarios and performance environments. The project also aimed to provide students with a better understanding of the fundamental concepts, namely the technical, perceptual and artistic features of spatial sound, thus enabling them to design and implement interdisciplinary projects at a professional level. Table 3 shows some examples of collaboration projects developed by LICA students and the role that spatial design played in the development and implementation of each project.

Among the various collaborations developed by students, probably one of the most original and well-conceived works was a performance project involving theatre and music students. In this case, students from both disciplines worked together with the aim of developing a devised dance piece

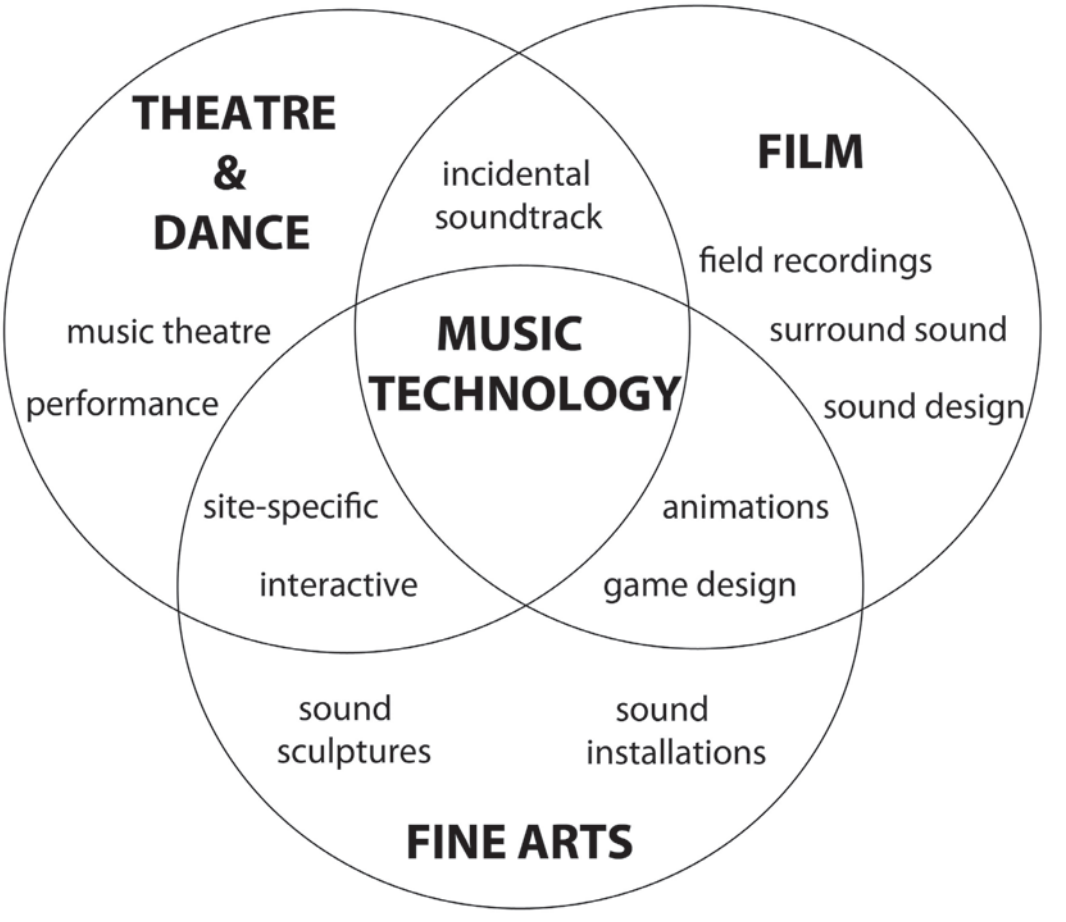

Figure 1: Interdisciplinary features of music technology used to frame teaching projects at the LICA.

that would relate actions of performers onstage with the spatial design of a stereo composition. From the start of the project it became clear that most students involved in the collaboration were familiar with notions of the physical space from their own disciplines: theatre students from the viewpoint of stage performance and music students from the perspective of studio production and film sound design. After an introductory session, where the aims of the collaboration were explained to students by tutors from both disciplines, students were organized into groups and worked for several weeks developing ideas and drafts based on narrative or abstract themes related to the overall topic of exploring the physical space. Some groups worked with text excerpts from short stories while others based their work mostly on devised movement materials developed through a series of simple workshops with performers. From the early stages of the collaboration, it became apparent that using common themes or shared strategies as a way of engaging students from different disciplines to collaborate and achieve a well-integrated piece is quite important (Hellwege 1993: 26). In this case, the clear and simple nature of

the overall topic helped the participants to relate artistically to each other by taking an active role in the conception, development and implementation of the collaborative work. It also became clear that the success of the collaboration in this case relied on the fact that most students understood and valued their roles in the project and were happy to learn from others by sharing their own expertise. While most students were comfortable with this new shared creative process a few students struggled to engage in a dialogue with others when pushed away from their comfort zone, in a similar way as in the examples described by Miler (Lattuca 2001: 115). This tendency was more notorious with students with well-developed skills in their own disciplines, as they were not always keen to collaborate with students with other backgrounds. On the other hand, students with less-developed skills in their own disciplines seemed to be more open and flexible to others' ideas and keen to interact in groups. This showed that, to some extent, the knowledge and expertise of the participants can, in some cases, restrict their openness when dealing with problems that go beyond their expertise. R. Ellis describes this quoting Popper: 'students need to understand that they are not students of some subject matter, but students of problems. And problems may cut right across the borders of any subject matter or discipline' (2009: 8).

Another interesting aspect of the student project was the extent to which participants from the two disciplines managed to develop shared ideas using non-disciplinary knowledge like the ones mentioned by Repko (2007:132). In this case, the idea of using abstract and narrative topics from various sources to develop ideas for a piece helped students to relate and discuss their subject's knowledge about the physical space within a clear and well-defined research framework (Hellwege 1993: 26). Students seemed to realize early on in the project that they needed to understand the complexity and nature of the other discipline in order to solve a problem that was beyond their own subject area. One interesting example of this was a project where students used as the structural basis for their work a short story by Edgar Allan Poe. In this case, as a starting point in the project, theatre students worked with the original texts to develop character dialogue that could be used and integrated as part of the dance. The dialogue speech was then recorded by the music students and used as the raw material to compose the soundtrack of

Student project	Method	Spatial design
Film collaboration	Film soundtrack created using speech and field recordings	Stereo track combining music, field recordings and speech samples
Dance collaboration	Composed soundtrack synchronized with speech delivered by dancers onstage	Stereo composition produced in recording studio and text score developed with performers through workshops
Collaboration with visual artist	Loudspeakers installed among sculptures and paintings in art studio	Site-specific piece created using multi-channel audio for art studio
Theatre collaboration	Synchronization track with recorded instructions for performers played through headphones	Synchronized delivered speech by performers arranged in a circle

Table 3: Examples of students' interdisciplinary projects involving the use of spatial sound design.

the piece, which revolved around the idea of playing with the sounds and meanings of the recorded words. Finally, all students worked together trying to find the right balance between the movement material and the composed track for the final version of the piece. As suggested by Hellwege, the positive outcome of the project showed that the key for implementing a successful interdisciplinary teaching approach might be to create an inclusive environment where students can break their inhibitions and prejudices towards other disciplines (1993: 26).

SOME CHALLENGES OF AN INTERDISCIPLINARY CURRICULUM DESIGN

Having identified some important aspects of student collaborations that can contribute to interdisciplinary teaching it is important at this stage to try to understand ideas that could help us shape an effective interdisciplinary curriculum design. In this section three of the main areas of aspects of course design identified by S. Toohey will be discussed in relation to interdisciplinary aspects of music technology teaching (1999: 48–49):

- What content is essential and what is desirable?
- What purpose do we need assessment to serve and what form should it take?
- What resources and infrastructure are needed?

Essential content

As outlined by C. Boehm, one of the main challenges of music technology courses in recent years has been to provide a framework to effectively combine deep specialisms and broad interdisciplinarism (2007: 13–16). As shown by the examples discussed above, it is feasible to reinforce the identity of courses by incorporating topics related to other disciplines as a way of allowing students to engage with specific issues within their fields from a different perspective and at the same time relate as field specialists with practitioners from other disciplines. An effective way to achieve a balance between deep specialisms and interdisciplinarism might be to develop further existing practice-based modules as a platform to incorporate an artistic vision that goes beyond the realm of one specific subject. In most cases, this can be done by reinforcing contextual aspects of the curriculum that are shared with other art courses like performance, media and cultural studies. It is important, as mentioned by Boehm, that the nature of these aspects of the curriculum are designed with an interdisciplinary approach in mind, trying to create a link with specific aspects of each degree 'glue courses' (2007: 13–15). Another effective way of engaging students with different interdisciplinary aspects of the curriculum is to try to create links to professional practice as a way of understanding and learning from ways of approaching knowledge in a work-based learning environment (Irving 2009: 84). This has been done successfully in recent years at LICA through the implementation of an enterprise unit module that aims to give students the opportunity to combine practical work in a specific field with the research skills to reflect academically upon their practical experiences (Lancaster Institute for the Contemporary Arts Enterprise 2012). Students are allowed to do a placement in a professional or commercial setting and their final project is based on that experience. In line with R. Priest's findings, initial results show that a placement in a professional environment can be instrumental in helping

students to engage with other disciplines, acquire a deeper knowledge of their own subject area and improve their employability skills (Priest 2010: 63).

Purpose of assessment and methods

One of the challenging aspects of an interdisciplinary curriculum seems to be how to assess students with different types of backgrounds. As exemplified by L. Lattuca (2001: 147) it is important to make adjustments to the way assessment is handled when trying to deal with an interdisciplinary curriculum keeping in mind that the reliable assessment is one that produces consistent results. One way of approaching this is by trying to achieve an 'authentic assessment', which is based on setting tasks as closely related as possible to those that exist in a professional environment (Stefani 2009: 44), trying to avoid the *potpourri* approach mentioned above. This could allow teachers, as suggested by H. Hayes Jacobs, to become active curriculum designers that determine and balance the degree of integration of the different disciplines in the curriculum so that students acquire a range of experiences that reflects on a discipline field and an interdisciplinary orientation (1998: 9). In this context it is important to understand that the interdisciplinary curriculum needs to be used when really the problem reflects the need to overcome fragmentation (Hayes Jacobs 1998: 10) and teachers need to be aware of the different types of students' backgrounds when designing the assessment criteria for interdisciplinary modules that involve students from different sections or departments. In this context, an effective assessment strategy within LICA has aimed to try to adapt and adjust those assessment methods that are currently working well in each of the sections avoiding trying to make interdisciplinary aspects of the curriculum look like the boring and theoretical parts. Previous teaching experiences across LICA suggest that students are very good in detecting parts of the curriculum that have not been carefully designed and often will not take these very seriously. It is therefore important to learn from some of the successful teaching collaborations like the one mentioned above, which have allowed colleagues to develop effective relationships across disciplines when devising shared assessment strategies, as exemplified by S. Wareing (2009: 63).

Resources and infrastructure

The issue of shared resources and infrastructure seems to be one of the most controversial issues when it comes to the design and implementation of interdisciplinary activities. As pointed out by Lattuca, shared teaching spaces and budget planning can create conflicts that can be detrimental in the long term (Lattuca 2001: 47–48). Recent teaching projects implemented at LICA show that an effective use of digital technology can be one of the best ways to overcome some of these difficulties and also encourage students to get an insight into other art disciplines. In recent decades technological tools, mostly in the form of software, have become much more flexible allowing users to easily switch from one discipline to another. Nowadays, software tools for sound, graphics and video editing include similar user interfaces which allow users to quickly adapt from one software application to another and work in a variety of learning contexts (Bates and Poole 2003).

Another relevant aspect to take into account is the importance of virtual environments when dealing with an interdisciplinary problem-based learning environment. As discussed by C. Bereiter, there are different types of technology applications available that can support an artistic problem-based

environment and enhance the involvement of students in the development of interdisciplinary research projects (2000: 191–93). An active use of problem-based learning environments with different levels of options for students' reflection like the one described by A. Littlejohn and D. Nicol (2009: 32–34) could be a very effective way to approach interdisciplinary learning.

CONCLUSION

The enhancement of interdisciplinary features involved in the curriculum design of art courses like music, theatre and fine arts should be a well-crafted and synchronized activity across disciplines in order to avoid the *potpourri* approach. One effective way of achieving a good balance between discipline-based and interdisciplinary knowledge is to utilize as a teaching framework a professional work-based environment based on the development of specific skills. In order to achieve this, the discipline-based aspects of the curriculum related to these skills need to be reinforced as a way of creating clear links between the curriculum content and specific aspects of contemporary professional practice relevant to each course. This process should be based on an understanding of shared ideas across disciplines and do not deny the nature and identity of the specific disciplines involved. As exemplified in this study, there are many obvious challenges involved in the development and implementation of successful interdisciplinary projects that will allow students to understand and value the importance of their individual contributions in an extended collaborative environment. As a way of enhancing this new extended learning landscape tutors across disciplines will need to understand their role as active curriculum designers determining the nature and degree of integration of a new curriculum scenario for the arts.

REFERENCES

Bates, A. and Poole, G. (2003), *Effective Teaching with Technology in Higher Education: Foundations for Success*, San Francisco: Jossey Bass, pp. 76–84.

Barker, P. (2002), 'Sound and dramatic art', in T. Bicât and C. Baldwin (eds), *Devised and Collaborative Theatre*, London: The Crowood Press, pp. 75–87.

Bereiter, C. (2000), 'Process and product in problem-based Learning', in D. Evensen and C. Hmelo (eds), *Problem-Based Learning*, London: Lawrence Erlbaum, pp. 185–195.

Boehm, C. (2007), 'The discipline that never was: Current developments in music technology', *Journal of Music, Technology and Education*, 1: 1, pp. 7–21.

Ellis, R. (2009), 'Problems might cut right across the borders: Why we cannot do without interdisciplinarity', in B. Chandramohan and S. Fallows (eds), *Interdisciplinary Learning and Teaching in Higher Education*, New York: Routledge.

Ferreira, M. d. S. G. (2007), 'Crossing borders: Issues in music technology education', *Journal of Music, Technology and Education*, 1: 1, pp. 23–35.

Hayes Jacobs, H. (1998), *Interdisciplinary Curriculum: Design and Implementation*, Washington: Association for Supervision & Curriculum Development.

Hellwege, P. (1993), 'Aesthetic dialogue: Art and the interdisciplinary curriculum', *Art Education*, 46: 5, September, pp. 26–44.

Irving, K. (2009), 'Work-based learning as interdisciplinary study: a study of pedagogy and practice', in B. Chandramohan and S. Fallows (eds), *Interdisciplinary Learning and Teaching in Higher Education*, New York: Routledge, pp. 84–90.

Lattuca, L. (2001), *Creating Interdisciplinarity*, Nashville: Vanderbilt University Press.
Lancaster Institute for the Contemporary Arts (LICA) (2012a), 'LICA undergraduate', http://www.lancs.ac.uk/fass/lica/undergraduate. Accessed 12 December 2012.
Lancaster Institute for the Contemporary Arts (LICA) (2012b), 'LICA Admissions Report', Internal report, September 2011.
Lancaster Institute for the Contemporary Arts Enterprise (2012), 'Lancaster Institute for the Contemporary Arts Enterprise Unit', http://www.lancs.ac.uk/enterprise. Accessed 6 August 2012.
Littlejohn, A. and Nicol, D. (2009), 'Supporting interdisciplinary studies using learning technologies', in B. Chandramohan and S. Fallows (eds), *Interdisciplinary Learning and Teaching in Higher Education*, New York: Routledge, pp. 30–43.
Otondo, F. (2007), 'Rediscovering Artaud's sonic order', *Journal of Music and Meaning*, 9: 1, pp. 3–10.
Powell, T. (2007), 'Review of To have done with the judgment of Artaud', Broadway Baby Edinburgh Fringe Festival reviews, http://www.broadwaybaby.com/listing.php?id=1786. Accessed 10 July 2013.
Priest, R. (2010), 'The value of placements to undergraduate BSc (Hons) Music Technology students', *Journal of Music, Technology and Education*, 3: 1, pp. 47–65.
Repko, A. (2007), 'Interdisciplinary curriculum design', *Academic Exchange Quarterly*, 11: 1, pp. 130–37.
Stefani, L. (2009), 'Assessment in interdisciplinary and interprofessional programs: shifting paradigms', in B. Chandramohan and S. Fallows (eds), *Interdisciplinary Learning and Teaching in Higher Education*, New York: Routledge, pp. 44–57.
The Times online (2008), 'Good university guide', http://www.timesonline.co.uk/tol/life_and_style/education/good_university_guide. Accessed 12 December 2012.
Toohey, S. (1999), *Design Courses for Higher Education*, London: Open University press.
Tufnell, M. and Crickmay, C. (2001), *Body Space Image*, London: Dance books, pp. 114–40.
Wareing, S. (2009), 'Understanding how students learn, both generally and in the subject', in B. Chandramohan and S. Fallows (ed.), *Interdisciplinary Learning and Teaching in Higher Education*, New York: Routledge, pp. 58–65.

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