A pedagogy of connection and boundary crossings: methodological and epistemological transactions in working across and between disciplines

Patrick Dillon*

School of Education and Lifelong Learning, University of Exeter, Exeter, UK

This paper develops the idea of a pedagogy of connection for working across and between disciplines by examining transactions that take place at the boundaries between contributing disciplines. Characteristics of cross-disciplinary work are outlined and a case is made for regarding it as a creative and integrative activity. An analysis of two cross-disciplinary books is presented as a means of raising some of the methodological and epistemological issues involved in working across disciplines. The issues may be conceptualised as boundary objects and addressed through a pedagogy of connection which takes account of: (1) interventions and the use of tools within the contexts and niches in which they are situated, and (2) the notion of changes in learning behaviour that are of consequence and an environment that affords those changes.

Keywords: pedagogy of connection; boundary object; boundary crossing; interdisciplinary; multidisciplinary

Introduction

Shulman (1987) and others have developed a convincing argument for pedagogical content knowledge associated with teaching and learning within disciplines. In an earlier paper (Dillon, 2006), a case was made for a pedagogy of connection for working across and between disciplines. A pedagogy of connection is grounded in integrativism and consists of a framework for focusing on the contexts of connection and tools for making connections. Working across and between disciplines is presented as a creative activity as it has potential for generating something novel, original, unexpected (e.g. Leach, 2001).

Alongside its creative potential, working across and between disciplines generates a number of intellectual and practical tensions. A pedagogy of connection must take account of the academic currencies and rules of the contributing disciplines and ensure that border transactions are properly negotiated. In this paper, some methodological and epistemological issues are explored. They arise from two published works that are cross-disciplinary in their approaches and deal with cross-disciplinary subjects. The works analysed are Vargish and Mook’s Inside Modernism (1999) and Finn’s Past Poetic (2004).

Vargish and Mook (1999) uncover some common structures and values that underlie Modernism. In order to demonstrate that physics, painting and fiction of the period share a high degree of definable value, they identify some cultural diagnostics through which they abstract the historically defining values of the movement. Finn (2004) explores how two Anglo-Irish poets, W.B. Yeats and Seamus Heaney, use archaeology in their work and how, in turn, their work may be used as a filter for a reading of the history of archaeology.

*Email: p.j.dillon@ex.ac.uk
From an analysis of these works, some transactions that occur at the intersections of disciplines are explored. The notion of boundary objects is used to conceptualise these transactions and examine their implications for a pedagogy of connection.

Disciplines, boundaries and crossings

The history of the development of knowledge is characterised by the progressive discovery of laws of nature, the application of these laws to modifying the natural world and developing material culture, and an associated shift from qualitative to quantitative perception (Crosby, 1997; Machlup, 1980). Knowledge becomes structured in disciplines, and creativity becomes synonymous with productive work within a discipline. Disciplines have been defined as (1) bodies of knowledge that have been structured culturally and which can be acquired, practised, and advanced through the act of creating (Li & Gardner, 1993); and (2) culturally defined symbol systems that preserve and transmit creative products to other individuals and future generations (Sternberg & Lubart, 1999). Collectively, the people who select and evaluate new ideas, and thus who control and influence a discipline, are known as the ‘field’; they are the gatekeepers of disciplines (Sternberg & Lubart, 1999).

Educational systems, with their subject-based curricula and knowledge hierarchies, are a reflection of the enduring influence of fields and disciplines. Knowledge is typically valued and deemed to have creative potential when it: (1) is self-reflective, providing insights into its nature and trustworthiness; (2) provides foundations for discovery (an addition to propositional knowledge) and invention (an addition to prescriptive knowledge); (3) provides sets of executable instructions (techniques) and the means of improving them; and (4) is amenable to diffusion and utilisation. Knowledge valued in this way has two major shortcomings: (1) it differentially favours a utilitarian view of both knowledge and creativity, often under-valuing those disciplines (including, ironically, the creative and performing arts) not directly associated with primary means of economic production; and (2) it is bounded within self-reinforcing disciplinary structures with the result that inadequate attention is paid to the potential of working across, between and beyond disciplines.

The case for under-valued disciplines, especially the arts, has been made generally (e.g. Tusa, 1999) and educationally (e.g. Abbs, 2003). Here the concern is with the potential of working across and between disciplines.

The prefixes inter, multi, trans, para and post have all been applied to disciplinarity, each imparting a subtle but related change in meaning. To add to the confusion, the terms are used interchangeably and without precision. Moran (2002) provides an historical account of the confusion.

‘Inter’ signifies between, among, mutuality, reciprocity. Interdisciplinarity is the most widely used term for breaking out of disciplinary boundaries and the term that has been used most indiscriminately. Nicolescu (1997) defines it as the transfer of methods from one discipline to another.

‘Multi’ signifies combination, and multidisciplinarity is widely taken to mean studying or researching in more than one discipline simultaneously (Nicolescu, 1997). Moran (2002) sees multidisciplinarity as the juxtaposition of two or more disciplines, as in a joint honours course; the relationship is one of proximity.

Both interdisciplinarity and multidisciplinarity, as Nicolescu (1997) points out, overflow disciplinary boundaries but their goals remain limited to the framework of disciplinary research. This contrasts with transdisciplinarity (trans – across, beyond, into another state) where the goal is the unity of knowledge. Transdisciplinarity cannot be accomplished within a framework of disciplinary research.
Collectively, these terms encompass both a critique of the way knowledge is organised and communicated and a search for new forms of knowledge. They are used variously to describe making connections between disciplines, an undisciplined space between disciplines, and activities that transcend disciplinary boundaries altogether (Moran, 2002). The last of these, transcending boundaries, has spawned a further term, ‘postdisciplinarity’. Foster (1999) has proposed yet another term, ‘paradisciplinarity’ (para – beside, adjacent, distinct from but analogous to), as the creative co-presence of mutually respecting disciplines. Moran (2002) eventually settles on interdisciplinarity, valuing its flexibility and indeterminacy, and taking it to mean any form of dialogue between two or more disciplines, but expecting it to be transformative, producing new forms of knowledge.

This paper is concerned with working across and between disciplines, that is, inter-and multidisciplinarity and, like Moran (2002), I associate them with transformation and producing something new. In pedagogical terms, these ways of working can be said to be integrative, derived from integrativism, a system of thought and action strongly adapted from Bunge (1983) by Åhlberg (1998) as a blend of critical scientific realism, empiricism, rationalism and constructivism. As the basis of a pedagogical framework for working across and between disciplines, integrativism requires tools for working in an integrative way and a means of contextualising both the tools and the activities they describe.

Crossing boundaries, making connections, moving and relocating ideas generally involves integrating content from two or more disciplines and creating something new. There is some evidence of a set of general traits for creativity that can be applied to various disciplines regardless of expertise – e.g. fluency, flexibility, originality etc. (Torrance, 1962) – things that are now called transferable skills. A pedagogy of connection is based on the premise that, in addition to any general traits, there are teaching and learning strategies that can be deployed to actively promote creative work across and between disciplines. Emphasis is placed on tools of connection, for example, comparison, association, analogy, metaphor, mapping and blending, tools that Boden (1999) associates with combinational creativity. These tools facilitate the movement of concepts and constructs in boundary transactions between disciplines. In the next section, some of the methodological and epistemological issues that arise from these transactions are explored.

**Cross-disciplinary work in practice**

What follows is an analysis of two books. Both deal with subject matter that is cross-disciplinary. In addition, one of the books explicitly claims to be interdisciplinary in its approach, and sets out a number of methodological and epistemological considerations. The other does not claim to be interdisciplinary and its methodological and epistemological bases have to be inferred. The approach adopted in the first might be termed, ‘constructed cross-disciplinarity’; in the second ‘eclectic cross-disciplinarity’.

**Inside Modernism by Thomas Vargish and Delo Mook (1999)**

*Inside Modernism* is a collaborative work between a professor of literature (Vargish) and a professor of physics (Mook). Vargish and Mook offer a broad, cross-disciplinary account of Modernism, uncovering some of its common structures and values. In order to demonstrate that physics, painting and fiction of the early twentieth century share a high degree of definable value, they identify three cultural diagnostics, that is, advanced intellectual activities, through which they abstract the historically defining values. The diagnostics they choose are
relativity theory, cubism and Modernist narrative. These three developments are, as Vargish and Mook point out, almost perfectly contemporaneous, they possess conceptual distance from each other, they cross national boundaries, and they develop rapidly, causing ‘revolutions’ in their respective disciplines. Each has attracted a substantial body of scholarship and analysis which, although discipline-specific, provides specialised confirmation of the generalisations.

The values, or common characteristics, that emerge across the contributing disciplines are: (1) epistemic trauma, a break with established theoretical norms; (2) contextualisation, as a shift away from absolute to normative standards; (3) observation, as replacing ‘reality’ as the subject for representation and analysis; (4) the concept of the ‘field’ [discipline]; (5) abstraction, as a spatial and/or temporal model of representation; and (6) reflexivity, the tendency to develop a dynamic, internal coherence. Each of these is functionally common to relativity theory, cubism and Modernist narrative. From the common characteristics, Vargish and Mook derive a ‘play of values’ that provides a more inclusive and comprehensive definition of Modernism, one that is ‘not based on a single discipline with a limited historical and national vocabulary’.

*Past Poetic by Christine Finn (2004)*

*Past Poetic* is a single author work. Christine Finn is a journalist and an archaeologist/anthropologist. She writes biographies and works at the interface between archaeology and literature. In *Past Poetic*, she explores how two Anglo-Irish poets, W.B. Yeats and Seamus Heaney, use archaeology in their work and how, in turn, their work may be used as a lens for a reading of the history of archaeology.

Finn describes her methodology as ‘a scattering, a borrowing of techniques and directions from archaeology, English literature, folklore, science and history’. This, she says, reflects a late-twentieth-century shift from positivism towards relativism in the interpretation of things from the past. Her technique is both analytical and metaphorical: for example, fieldwork is used to denote both literary analysis and archaeological excavation. The material artefacts of the poet are ‘photographs, antiquarian salvage, objects in exhibitions, domestic paraphernalia’. Some of these, she says, would be regarded by archaeologists as classifiable data, artefacts in the traditional sense, others are *objets trouvés*, engaged as part of the poet’s creative lexicon. For Finn, the ambiguity of the term fieldwork lends itself to the ‘purposeful play of the poet’, whose achievement comes through the ‘slipperiness of language and meaning’. Fieldwork is used to describe purposeful activity in archaeology and other disciplines. It is also the title of a book of poems written by Heaney in 1979 and, through this conjunction, it is used by Finn to describe the gathering and harvesting of material, or artefacts, by Yeats and Heaney as writer’s tools, or *aides mémoires*.

**Discussion: boundary objects, boundary crossings and a pedagogy of connection**

A pedagogy of connection consists of a framework to conceptualise integrative work and tools and interventions to facilitate it. The framework focuses on the *contexts* of connection. There are various ways of conceptualising context: (1) as an interaction of locational, experiential, and transactional features and factors in an activity system; or (2) as *niches* which define the positions or roles of individuals within given situations, and states of competition between their beliefs, ideas and forms of behaviour (Dillon, 2008). Education may be viewed as *interventions* in activities and transactions within these contexts or niches. Interventions involve the use of tools; tools can be anything that facilitates an intervention.
(Loi & Dillon, 2006). Tools that facilitate connection include comparison, association, analogy, metaphor, mapping and blending.

To be useful in a pedagogy of connection, tools should facilitate connections that engage learners in transitions in their thinking that are of consequence. Consequential transitions are where learners transform their understandings of themselves in relation to their environments by connecting personal sense and other kinds of meaning. A transition is of consequence when it is consciously reflected on or struggled with (Beach, 1999), or when it is ‘internalised’ and becomes part of the individual’s repertoire of psychological tools (Kozulin, 1998). Interventions can lead to consequential transitions only if the learning environment is conducive to them, that is, configured in such a way as to afford these actions and outcomes. Several educational matters relevant to working across and between disciplines converge here: (1) the nature of the interventions and the use of tools in the contexts and niches in which they are situated; (2) the notion of changes (transitions) in learning behaviour that are of consequence; and (3) the nature of environments that afford consequential transitions. These matters may be explored through the notion of boundary objects.

Star and Griesemer (1989) conceived the term boundary object to account for the transactions that had to be brokered between different academic, professional, amateur and administrative actors to enable the successful completion of an environmental and archival conservation project. Star and Griesemer described the general categories of boundary object that emerged from their study. Their original definition of boundary object was ‘analytic concepts of those scientific objects which both inhabit several intersecting social worlds and satisfy the informational requirements of each of them’ (1989, p. 393). Since then, the idea of a boundary object has been both extended and refined, not least through conceptualising it in terms of transactions between defined communities of practice (Wenger, 1998).

Boundary objects are now taken to be artefacts, documents, institutional and administrative protocols, etc. that have to be addressed by people from different communities if shared understandings are to be built. Walker and Creanor (2005) describe a boundary as a discontinuity in some form of practice, often determined by limits of effective communication (e.g. between communities of academics and communities of students). Boundary encounters occur as people interact across these boundaries. They may be interpersonal or mediated by artefacts (i.e. tools). Boundary crossings are the flow of ideas, constructs and innovations across boundaries. Walker and Creanor (2005) discuss four inter-related elements influencing learning events that cross boundaries: (1) the type of boundary; (2) the location of the boundary amongst the actors involved; (3) the role of the boundary; and (4) the significance of the boundary. In terms of a pedagogy of connection, these are all important contextual or niche features and factors.

In the Vargish and Mook study, which is explicitly cross-disciplinary, three inter-related matters emerge about working across and between disciplines that may be generalisable as boundary objects for such work. They are (1) epistemological transactions; (2) language transactions; and (3) disciplinary protocols. Similar matters may be traced in the eclectic cross-disciplinarity of Finn, suggesting a wider generalisability which might form the basis of some benchmarks for addressing cross-disciplinary boundary objects within a pedagogy of connection.

**Epistemological transactions**

Vargish and Mook’s three cultural diagnostics – relativity theory, cubism and Modernist narrative – are on the one hand epistemologically synergistic, but on the other lead to epistemic trauma within their respective disciplines. They are synergistic in the sense that

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
relativity is a theory of measurement of space and time, cubism revolutionises the treatment of space in visual representation, and Modernist fiction explores the possibilities of a new temporality in narrative. In other words, there is some compatibility between the knowledge structures in the contributing disciplines. Epistemic trauma arises from the ‘revolutionary’ impact of relativity theory, cubism and Modernist narrative on the dominant ideas within the respective disciplines at that time:

...such liberation, the elimination of conventional techniques and concerns, is probably felt as a difficulty at first and the characteristic reaction to the new phenomena may be a feeling of bereavement and outrage. The traditional guidelines disappear along with the traditional complexities, those organising ideas and devices that provided keys and coordinates of meaning. (Vargish & Mook, 1999, p. 15)

These epistemological compatibilities and tensions are mirrored in Finn's study. A unifying 'value' (to adopt the term coined by Vargish and Mook) of poetry and archaeology is, according to Finn, reciprocity in terms of the forms of reinterpretation they offer:

In the case of archaeology, the excavators are left to speak for the dead and what they have left behind as evidence of lives lived. This communication on behalf of inanimate objects is a poetic instance. By extending this idea, literally, to poetry, it is possible to see how Yeats's and Heaney's words enable statues, mosaics, Viking combs, 'bog finds', objects trouvés, to speak. And the process is two way. (Finn, 2004, p. 129)

Epistemic trauma in archaeology is associated with a shift from positivism to relativism and of the corresponding approaches adopted in each. Over the period in which Yeats and Heaney lived, spanning 1865 to the present, archaeology has, according to Finn, moved away from its 'dilettante antiquarian origins, through scientific positivism, to a relativism partly founded on ideas from other disciplines'. By tracing archaeology's development over the period of the poets' lives, Finn is able to consider the way the discipline has changed, its effects on the poets, and how their poetry has contributed to a wider audience for archaeology. The boundary issues here take in tensions between processual approaches to archaeology, based on an evolutionary perspective on material culture and a dependence on field work and scientific interpretation, and post-processual approaches, with their openness to multiple meanings and interpretations and reliance on perspectives from the social sciences, philosophy and, as Finn demonstrates, literary criticism.

**Language transactions**

Terminological difficulties are encountered by Vargish and Mook and by Finn. Vargish and Mook acknowledge that crossing boundaries caused them considerable terminological difficulty. Most concise language, they say, is field [discipline] specific and involves technical terminology and jargon. They take pains to arrive at language that works throughout Modernism. In their description of values that are not field [discipline] specific, they employ language that is equally accessible across disciplines. In doing so, they acknowledge that the accessibility of certain characteristics of this kind of more general (but still precise) language inevitability affects its subject. They imply that cross-disciplinary work requires a language comprising transferable, hybrid and emergent terminology that provides sufficient common elements to enable dialogue between the contributing disciplines. In contrast, for Finn, it is the 'slipperiness of language and meaning', 'poetic licence' as it is commonly known, that enables the poet to deal with ambiguity. She also finds some
common elements through metaphor, which enables the ‘business’ of both archaeology and poetry to be captured through reciprocal representations.

**Disciplinary protocols**

These are centred mainly on knowledge claims which include disciplinary constructs and concepts, their justifications and verifications, the ways in which they are contested, and the social and intellectual milieu in which they are developed. They are the intellectual currencies and rules of the contributing disciplines. Understanding the rules and currencies helps ensure that when constructs and concepts are moved between and across disciplines, the potential and limitations of their contributions to new formulations of knowledge are better appreciated. The contested nature of disciplinary protocols is illustrated through the epistemological and language issues in the books discussed above.

In addition to the transactions involved in crossing boundaries between disciplines, a pedagogy of connection is concerned with outcomes, that is, new processes and new configurations of knowledge.

**New constructions of knowledge**

Vargish and Mook feel that cross-disciplinary work should engage its students in some sense of ‘hands-on’ play with the values derived. For Vargish and Mook this invokes some of the ‘hard questions’ of cultural history: What does it mean to shift one’s attention from a presumed external reality, the world, to focus on one’s observation or measurement of the world? What happens to the way we perceive when we shift our ideas of things away from normative standards for objects and events ‘in themselves’ towards the apprehension of objects and events as inextricable from their context? And so on. The ‘hands-on’ play with the values derived from working across disciplines advocated by Vargish and Mook has its equivalence in Finn’s ‘unifying value’ of poetry and archaeology and her adoption of Schon’s (1963) idea that metaphors are the traces left by the displacement of concepts: ‘the metaphors in language are to be explained as signs of concepts at various stages of displacement, just as fossils are to be explained as signs of living things in various stages of evolution’. This, says Finn, is suitably archaeological in its prose, and particularly apt in the study of archaeological evidence in literature.

As well as making connections and identifying and resolving tensions, both authors are inviting their readers to take the processes further, to make connections with their personal experiences and prior learning that ultimately establish individual meaning. Here we see the potential for the combination of analytical, integrative and synthetic forms of thinking that Sternberg and Lubart (1999) identify with [combinational, cross-disciplinary] creativity. Understanding how ideas and concepts have developed within disciplines, how they are verified, and their potential for contributing to a bigger picture involves analytical thinking. Moving ideas between disciplines and working simultaneously in more than one involves integrative thinking. Recognising new patterns that emerge from reconfigurations of ideas and concepts and developing new frameworks to accommodate them involves synthetic thinking. Cross-disciplinary creativity might thus be defined in terms of negotiating boundary crossings and applying a combination of modes of thinking in the generation of new outcomes.

**Notes on contributor**

Patrick Dillon is Emeritus Professor of Education at the University of Exeter. His research is concerned with the cultural situatedness of education and includes work on situated learning, second
language learning, heritage education, e-learning, creativity, design education and environmental education.

References