

**Theorising professional development in the academy:
A conversational approach**

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There is increasing recognition of the need to rethink academic professional development, to shift it from industrial-era craft-based approaches to approaches more in tune with the complex, multi-faceted demands of contemporary higher education. We describe and analyse the learning of a group of three academics over a series of six audio taped conversations. Participants appeared to refine, by means of selection over time, the ways they categorised or carved up their world. Our findings suggest the potency of reconceiving professional development generatively, in terms of a biologically based selectionist theory of learning. We discuss the need for follow-up investigations of the extent to which these academics' regenerated ideas inform their professional practice.

Introduction

Professional development, in Education, has traditionally been cast as if it were a craft apprenticeship. As late as 1989, reviewing professional development models, Sparks and Loucks-Horsley concluded that 'staff development possesses a useful 'craft knowledge' that guides the field' (p. 54). Little (1993) characterised professional development opportunities as a menu of training options, where the practice involves 'transmitting some specific set of ideas, practices, or materials to teachers' (p. 133); and Stein, Smith and Silver (1999) described it as a craft which traditionally has been defined as providing courses, workshops, and seminars to teach these techniques and designed to support 'a paradigm of teaching and learning in which students' roles consisted of practicing (*sic*) and memorizing straightforward facts and skills, and teachers' roles consisted of demonstrating procedures, assigning tasks, and grading students' (p. 28). In such apprenticeship models, a master or expert operating in a community of practice 'hands down' skills and information to a novice who gradually accumulates the settled knowledge of that particular practice through observing and participating in the community, and over time newcomers become old-timers (Lave and Wenger, 1991). In these craft practices, knowledge risks being viewed as fixed, complete and unproblematic, guarded by gatekeepers, made available step-by-step, applied or followed as generic procedures, 'recipes' or templates in different contexts, and produced using these codified practices.

Such an approach fits an industrial era. Yet 'we live in a period of transition between an industrial society and an information society' (Tiffin and Rajasingham, 1995, p. 1). Our information era uses complex communication systems, open and open-source information networks, allowing access over distance and time, and across discipline communities. These and other radical cultural changes have led some researchers to call for a radical, new paradigm for professional development, in which we 'begin anew, observing, describing, and theorizing about how learning works for adult professionals (particularly teachers) living and working in complex professional contexts' (Clark, 2001, p. 10). Such a paradigm 'demands a new conceptual grounding, one that also incorporates theories of how teachers learn within organizations and through interactions with others' (Stein, Smith and Silver, 1999, p. 265). Such a paradigm engages with the question of how academic development theorises itself (Peseta et al, 2005).

So, how might academic professional development recognise these wider changes in society and culture? A selective review of research, including commentaries and case studies, reveals the following recommended design parameters for professional development in Education:

- **Thinking beyond a short-term view and connecting to global influences.**
'Universal uncertainty, rapidly changing circumstances, and locally distinctive challenges call for a fundamental redesign of approaches to ... lifelong learning' (Clark, 2001, p. 4), setting learning within its developmental history. Teachers work to connect their local knowledge of practice 'to larger intellectual, social, and political issues as well as to the work of other teachers, researchers, and communities' (Cochran-Smith and Lytle, 2001, p. 49).
- **Responding to local needs.**
So, 'learning conversations ... would evolve and diverge from one another to fit the unique opportunities and constraints of local situations, distinctive teacher personalities, and social and educational changes that are unpredictable in principle' (Clark, 2001, p. 8). Here, teachers' personal experiences with their students in their subject can be heard, and ideas can be progressed in ways that are in tune with particularities of the local culture or needs (Stein, Smith and Silver, 1999).
- **Led by teachers who set the agenda, undertaking self-governance, and engaging in inquiry in collaboration with others.**
Teachers become 'interlocutors in the process of their own learning and professional development' so that their ideas, problems or interests can be pursued (Clark, 2001, p. 4) They develop and sustain mutually respectful relationships in which to work with complex ideas (Stein, Smith and Silver, 1999) in an atmosphere of safety, trust and care (Clark, 2001): 'a radical shift from control of topics and agenda by university-based teacher educators exclusively to control by teachers or by a partnership of members from both groups' (Clark, 2001, p. 7).
- **As part of professional practice and experiences, recognising diversity and uniqueness as integral.**
Teachers relate and sustain conversations about their profession, to learn from 'personal narratives of teaching experiences' (Clark, 2001, p. 6) and from students' work (McDonald, 2001). 'It is assumed that the knowledge teachers need to teach well is generated when teachers treat their own classrooms and schools as sites for intentional investigation at the same time that they treat the knowledge and theory produced by others as generative material for interrogation and interpretation' (Cochran-Smith and Lytle, 2001, p. 48). A teacher's principled knowledge base is used in 'very noisy, interactive, moment-by-moment decisions that constitute teaching' (Stein, Smith and Silver, 1999, p. 265).

The professional development approach we report in this paper was built on these parameters, using conversation to mediate professional development. As well, in framing that professional development approach, we began with a particular, biologically based generative theory of learning (after Edelman, 1992, 1993 and Plotkin, 1994, 1997, 2002, 2004) and previously articulated in detail elsewhere (Schaverien and Cosgrove, 1999, 2000). We begin with a brief description of that theory.

A biologically based generative theory of learning

On this view, learning (knowledge in itself as well as knowledge-gaining) is conceived biologically: as an adaptation (after Edelman, 1992, 1993 and Plotkin, 1994, 1997, 2002, 2004), a behaviour, in this case, that hedges chances of survival. Such a view yields a unifying selectionist account of learning at the nested levels of genetic knowledge (gained through natural selection), organ system knowledge (including through brain and immune system function) and cultural heritage. In essence, then, such an account conceives of learning as generating ideas, testing them on their value and keeping those that survive these tests and thereby supplies a level of explanation that enables theory-testing in the discipline of

education (for example, Schaverien and Cosgrove, 1997, 1999, 2000). So this biologically derived conception of learning is more than metaphorical: it makes explicit the common core of genetic, individual and cultural knowledge gaining (after Edelman, 1992, 1993 and Plotkin, 1994, 1997, 2002, 2004). Here, learning has three central characteristics: it is driven by values, it is a process of generating and testing on these values, and it is developmental.

Previous tests of this generative theory have been conducted by way of empirical studies of students' and teachers' learning, learning to teach, and teaching, including analyses of the design and operation of technological contexts for learning. These studies have provided evidence of diverse theory-affirming features, including the value-driven and epigenetic nature of individuals' learning and its strongly selectionist (generate-test-regenerate) character (for example, Hall and Schaverien, 2001; Schaverien, 2003; Shepherd, Clendinning and Schaverien, 2002; Forsyth and Schaverien, 2004).

The present paper extends these tests of this theory by taking our exploration of learning through conversations into an academic professional development context in a particular, technologically rich higher education setting. Previously, in educational settings, conversations with particular features (for example, where participants are agents, able to improvise and pursue their own questions in dynamic, emergent, free-flowing interactions (Christiansen and Devitt, 1997; Barratt-Pugh, 1999; Clark, 2001; Haigh, 2005), inquiring into their practice in professional communities (Lieberman and Miller, 2001; Putnam and Borko, 2000)) have been recognised as deeply powerful. According to these professional development approaches, researchers describe the conditions in which conversations thrive: analysing the qualities of good conversation and seeking to understand the interactions from socio-cultural perspectives. By contrast, we focus in this paper on analysing conversations in tune with our biologically based theoretical framework. We interrogate our data for evidence of selection and, even more specifically, of categorisation: that paradigm example of selection, in terms of which it might be possible to detect learning progression. Then, we try to frame educationally significant implications for future professional development and research and for a unifying conceptual synthesis.

Designing the study

One of the participants (TG) initiated the study to fulfill the requirements of the e-Learning Research and Development Project subject in her Master of Arts in e-Learning degree. She arranged (but did not audio tape) a first informal meeting with the other two participants (LL and GM), co-teachers of a postgraduate subject and academic colleagues in the same unit in which TG worked as an academic professional developer. Essentially, the subject LL and GM co-taught was a new design in its second semester of offering using technological means of teaching about technology. This initial meeting sought to ascertain what each participant might wish to achieve by engaging in a series of unstructured, collegial conversations. It was a preliminary attempt to set agendas together. Conversations started in the eighth week of semester.

Conversations were broadly framed. They emerged out of the individual perspectives and exploratory needs that were created moment-by-moment as in natural conversation (Zeldin, 1998). In the last conversation, LL called them 'free-form forming conversations'. Clark (2001) described them similarly:

Conversation feels more like an exploratory, wandering walk around a mutually interesting place than a direct journey from one point to another ... As a genre for learning and professional development, conversation groups have the wonderful quality of being controlled by the participants (p. 181).

This approach aimed to extend the academic professional conversations that occurred naturally in corridors within the academic workplace setting. It aligned with the principles of the conversational research methodology developed by Cosgrove and Schaverien (1996): the study was designed so that conversations could ‘evolve naturally and spontaneously’ (p. 108). *Here, each* participant was to have an *equal* though *different* role in deliberately assisting the others ‘to pursue their own investigations, to help them circumvent an obstacle to their thinking or to develop together a fruitful and related avenue of investigation or issue for discussion if ... [they] could see one, and with the benefit of ... [their] experience’ (a role Cosgrove and Schaverien (1996, p. 108) attributed to teachers). It also extended well-established, unstructured qualitative research approaches, in particular, in school-university collaborations and teacher-researcher contexts (for example, such rich case studies as Stein, Smith and Silver’s (1999) professional collaboration, and a professional developer’s ethnographic case study in supporting teachers’ use of technology (Housego, 2002)).

The inquiry was a case study. It focused on exploring and understanding how conversations about e-learning development might provide insights into a professional development model more attuned to the requirements of a changing academic context. If the case is a bounded, integrated system (Stake, 1998; Merriam, 1998), ‘a specific, a complex, functioning thing’ (Stake, 1995, p. 2) that can be fenced in, then the case in this study was primarily bounded by the conversations in themselves. However, other interactions between participants occurred throughout the investigation (including email exchanges, online discussion forum postings, and informal corridor conversations). TG established an online discussion forum (using the Blackboard Learning Management System) where transcripts of conversations were added as postings. So, all participants had access to the complete written text of the conversations as they occurred or shortly afterwards. Participants also used the forum to post resources or to contribute thoughts outside of the six conversation sessions.

Data therefore consisted of six audio taped conversations of between 45 and 90 minutes, transcribed in full. The first session occurred over lunch in a public though somewhat secluded space. Owing to the poor sound quality of recording obtained in this setting, the remaining five sessions took place in a quiet seminar room. The conversations spanned a seven-week period during the second half of a teaching semester. Other data that was collected included the online discussion forum postings, informal corridor conversations and subsequent field notes (taken by TG), copies of LL and GM’s own notes and diagrams, and email exchanges. Such data then allowed fine-grained analysis of the learning that occurred and testing of that data against a generative learning theory (Schaverien and Cosgrove, 1999, 2000).

Three Vignettes

We report our findings chronologically by means of three vignettes: the first describes participants’ agendas as they appeared in early conversations, the second tracks the ways these agendas progressed in collaborative conversation, and the third distils participants’ emergent ideas about professional work in the two concluding conversations.

Early Conversations: Three Agendas

Even before the first audio taped conversation in a preliminary meeting as well as in their online discussion board, all three participants were already considering what they wanted to know. A few days before the second session, LL and TG talked in passing at work about how the main research question had emerged in conversation between TG and LS, the academic supervising her e-learning research and development project. Then, just before the second meeting, TG initiated an email exchange about the framing of her main research question:

Thought we might start this session brainstorming together what we think the sub-questions might be, what you would like to gain, to find out, to explore, to develop from this study.

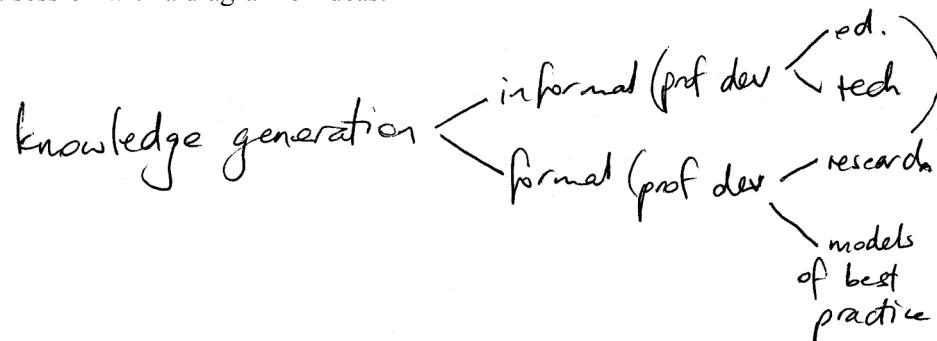
The research question has been shaped into:

What tangible benefits accrue from a series of professional conversations about e-learning development in higher education?

Talk spilled into the start of the second conversation as TG invited GM and LL to shape the sub-questions of the study, asking: ‘How is this really worthwhile to you? ... What can the sub-questions be, from what *you* want to look at, what *you* would like to?’ Over a sustained conversation, face to face and in their online discussion board, GM, LL and TG were to identify what they were curious about, raising ideas and questions that were driven by their own interests and influenced by their personal histories.

LL

Having thought about TG’s emailed research question and made some notes, LL came to the second session with a diagram of ideas.



LL talked about her diagram in this way:

LL: Well when I read the research question again, my *immediate* thought was knowledge generation is a clear, tangible benefit, but that can be formal and informal. Informal in that basically talking about what you do, how you teach, is always beneficial to your teaching. And, it can be informal knowledge generation about educational processes, it can [be] processes of teaching and learning. But it can also be knowledge generation about technological processes because we’re talking about e-learning, so technology is a big factor in that. But, I guess the benefit that I’m more interested in is the formal knowledge generation and how that can be translated into either some sort of research. How it can be disseminated I suppose.

TG: So if you’re looking at a question that you would like answered at the end of our time that we’re working on this, how would you frame that question?

LL: One of the sub-questions off the main one? I suppose ‘How can knowledge be generated from professional conversations about e-learning development in higher education? How can knowledge be formally generated and disseminated?’

TG: And what kind of knowledge do you anticipate looking at?

LL: It could be about models of best practice.

Her two questions signal what was to become a growing curiosity about how educational knowledge is produced. Though she is a doctoral graduate herself, LL had previously worked with already-collected ethnographic (principally interview) data but had not participated in educational research where knowledge generation was occurring minute-by-minute, for example, in classrooms or in less formal conversational groups. She seemed already to be identifying this kind of knowledge generation as a key interest in this inquiry. In particular, LL seemed to want to understand knowledge generation in terms of her responsibilities for

the postgraduate course (of which the subject she was discussing was a part). This required thinking about ways in which to hedge the chances of its success and continuance. As if to elicit any understandings LL might have about how students generated knowledge for themselves within the bounds of the subject, TG asked what happened when students were uncertain.

In what they've done so far this semester and what they've been learning, do you think that out of that [are] coming ideas that they may have questions about, that they may be grappling with? Is there a place for something like that?

The following conversation ensued:

LL: Certainly there's space for them, opportunity for them to ask it within their group. I think it's pretty clear ... they've all bought into that whole knowledge sharing process and they've actually written it into their learning contracts, that they're actually going to

GM: Yeaaaah [*prolonged utterance of agreement*]

LL: Seek each other for advice.

GM: Yeah, that was *really* apparent, wasn't it?

LL: Hmmm, yeah.

As the second conversation progressed, LL began to want to be able to document how educational knowledge might be produced in her subject. At the start of the third conversation, she mentioned the possibility of applying for an internal teaching award, saying that she wanted to know how their teaching work might be analysed and understood; she wanted 'not just a view from within but a view from without as well but looking into the course and looking at what we're doing, what we're trying to do and how we're doing it.' She wanted a way of attesting to such findings about knowledge generation in a public way in her field.

GM

Near the beginning of the second conversation, GM relayed a story of his informal interaction with a colleague about what it means to understand or know a particular concept. During that collegial conversation he distilled its essence in these questions: 'How do you know that? Is that something you've memorized? ... Or is there a *pattern* underneath that?' He now crystallised his thinking further, saying, 'Are students just memorizing stuff or are they seeing the pattern, the underlying *beauty* of it all that they can then internalise?' Next, he described (as he saw it) the process that he was undergoing in learning to teach in higher education (alongside co-teaching the subject with LL for the first time): 'looking at bits of information on teaching and learning and then being able to somehow gather that all up into a meaningful whole, albeit having a few gaps in it, and that for me it becomes some kind of knowledge ... When does that suddenly become an understanding of it ... something that's really internalised?' It appeared already that GM was formulating a strong interest in understanding teaching, a need to support learning effectively. Furthermore, at this point, his particular formulation seemed to be drawing on design metaphors grown over years of industry experience. The conversation elicited two domains in which GM was beginning to recognise his need to understand learning better. The first concerned the teaching of his subject and he put his question this way,

So, is teaching just a generic thing, a generic kind of understanding that people *get*? Then it's just up to them, you know, it's just a process of them getting themselves up to speed with the subject matter and they can then teach anything really. I don't know whether that makes any sense or not ... It's hard for me to make ... to frame this yet, 'cause I'm really not sure. It keeps changing and morphing all the time.

The second domain concerned the sometimes astonishingly powerful ideas of his students, an example of which he expressed in these words,

GM: But *where* did that group in the [group name], *where* did that knowledge of rationale come from? 'Cause I don't think we even covered that. So I was really surprised to see it there, and they were good too. They had to work out their criteria that they were going to assess each other on. So they devised all these criteria and then they gave a rationale for each criterion. And there were some *really* interesting insights into that.

TG: Why do you think they did that?

GM: *I don't know*. I haven't asked them yet but I was surprised to see, because they were quite good rationales. And I just thought – and the jaw dropped a little bit when I was reading it – I thought, '*Where* did they get this from?' because I don't remember saying anything about that.

These two excerpts illustrate GM's characteristic openness towards his uncertainties about learning and teaching and his questioning of the practices he came across in higher education. However, the two excerpts also indicate GM's urge, even at this early stage, to deepen his insights into his own learning to teach by way of understanding his students' more clearly. He was later, in the third conversation, to describe how people operated collectively in the digital media field showing how firmly these practice-based experiences underpinned his thinking about students' learning within the subject he was teaching:

And I think it's also indicative of the [digital media] industry that strangers with their own agendas and their own skills come together into groups with other people with their own agendas and different skills and manage to work together to achieve a common goal. And then disband and then continue with their own agendas. No one's asked, asking them, no one's asked in the industry to abandon their individuality and I wouldn't ask it of them in class either. I want them to be individuals at the start with strong opinions and I want them to come together and work through those in groups. And then separate at the end and be able to objectively reflect on the good and the bad and what they've learned and what perhaps they didn't learn as part of the experience. Because it's not also only highlighting what they think they can learn in this subject. It's also about highlighting what they feel they can learn in the course. Or what they feel they *want* to learn about interactive multimedia and *how* they feel they may address that, either in here, in the course or the subject or in their own time as well.

Even by the end of the first conversation, it was clear that GM was struggling with his own experience of conventional transmissive educational approaches that did not appear to give him the kinds of purchase on the agenda he was formulating for these conversations. For example, he recounted his own experience as a student in the course he is now teaching,

I hated it but it wasn't till way after the fact that I realized that I actually did learn quite a lot ... I think I learned stuff mainly because I internalised it in some way. I went to class, I did the assignments. I didn't think I was learning anything. Then after the fact I realized that I had internalised some of the things that we covered and was using them later, was linking ... 'ah I've faced this already I did that, I dealt with it that way. I probably should deal with it this way' ... I'm hoping that students get the same thing ... but perhaps after the fact, that they actually did cover a lot or if they're faced with a similar situation down the track that they go 'I'll react this way this time'. But as a lecturer you don't get that feedback straight away so you don't know really ... Sometimes I think because class is so tight you've got to get the lecture through you know ... there always seems to be rush rush rush for two hours.

So, GM appeared to want a far more fruitful, learning-centred set of approaches than he had so far encountered and he wanted the experience of this conversational inquiry to deliver them. Furthermore, he was not to know it but his early expressions of his agenda, permeated so thoroughly by a design orientation in its language and concept (of pattern and generics, for example), could supply the perfect medium.

TG

TG's pressing questions were not the main research question but ones she had originally posted in a forum of her Masters studies the previous year. They found their way into the present online discussion board in response to particular questions and comments made by GM in the second conversation:

I think the greatest benefit [of this study] for me is to be exposed to your process of research, number one. Cause I'll probably be involved in that next year doing my own stuff. So just seeing how somebody else does research. And this kind of research, cause there's research on the net, and there's *reading* kind of research. But you know, you're doing a more real life situation kind of research. So how you do that, I think, and watching that unfold, would be good for me.

It was on this basis that, over an interchange of postings with GM in the present online discussion forum, TG described her learning to research journey. In that recount, she reposted those questions from the previous year, which continued to be salient:

I'm trying to understand how an organisation manages the knowledge it needs to operate, to adapt, to change and innovate – and within that, how learning/training is organised.

I'm trying to figure out where the 'teacher', the educator, the trainer fits within this environment – both f2f and e – whether this is actually assigned to specific people, or ?

– and then, there's the question of educators/trainers as designers? – but I know from my own experience that in the role of designer, I'm also placed within the designed environment – as the learner. If that's the case I'm not sure how to reconcile [LS's] idea of educators as researchers of e-learning. I know there have been instances where researchers in science have actually been their own guinea pigs (eg ulcer research). Is this redefining how the researcher undertakes their work – so that they are participants in their own research, are part of and influence what they are researching? (17 August, 2001).

For TG, this study was to be the culmination of her Masters studies in e-learning. In that same year, she had made what she thought would be a temporary move: from working in the school system to the higher education sector. She was aware of the change in this new working environment to a culture of research into teaching and e-learning, and she set out to understand these changes, in this case, through conversation:

LL: Because, because this is a learning situation for *us* anyway when we have, when we consult colleagues, when we have professional conversations. It's a learning situation for us too. But what you're [TG] saying about testing yes. I mean, everything we trial every semester is a test, it's an experiment of sorts.

TG: That's probably the better word, 'experiment', seeing what happens. 'Test' often has such, negative connotations as in 'written'. But I guess I'm thinking more in terms of trying something out and seeing well what happens, what, what

LL: Yes that's right.

TG: And from that, what do you then choose to change? Or choose to keep?

LL: Hm yeah.

TG: How does it move forward from there?

LL: But the choices to introduce those things aren't made in a vacuum. They're the result of consultation and seeking out knowledge from other people who we respect or we consider more knowledgeable in a particular area than us. So they're informed choices.

So, in the early conversational exchanges, three agendas seemed to have been set: LL's as documenting how education knowledge might be produced in her subject and seeking a way to attest this knowledge generation in a public way in the field, GM's as gaining a far more fruitful, learning-centred set of approaches to teaching, and TG's as designing professional development in higher education underpinned by research-based and e-learning mediated approaches. In subsequent conversations, they progressed these agendas, together, in ways that we will now describe.

Middle Conversations: Progressing individual agendas together

The third and fourth conversations entered an intense phase of pulling apart the design of the subject: *Digital Media Development Process*. At first, the participants probed and analysed the subject design to understand how and what students might learn. Subsequently, the search shifted to finding out how LL and GM recognised the learning that might have taken place. Also, examples of students' assignments were analysed deeply and in fine detail. The participants looked into what measures LL and GM used to gauge the value of the work that had been submitted, and the ways in which this related to the design choices GM and LL had made for the subject.

A series of events leading up to the third session shaped that conversation's texture. In a passing encounter in their workplace, a few days before the second meeting, GM recounted to TG a conversation he had the previous week with one of his students who said to him that she finally 'got it' and that she understood 'what he was getting at'. GM expressed an intense interest in what she might mean by these words: he wondered about what he had said or hadn't said that had influenced her understanding, wanting to know about her experiences and intending to pursue a conversation with the student. Near the beginning of the second session, GM mentioned in passing what had transpired:

... like what I said about that student before where she said the penny dropped. I am going to unpack that a bit more. I have asked her whether she'd mind if I discussed that with her a bit more. But it is a really personal thing. It's her ability to internalise the knowledge in some way and getting an understanding, but that would be different for her, different for another student, different for another student. But are there common underlying things that occur with people in general, and I don't know the answer to that.

GM picked up on the thread again soon afterwards, this time tentatively speculating on what might have precipitated the students' understanding.

I wonder whether this student ... said that the penny dropped for her because she was asked to, they were asked as a group to do an assessment task. And by *doing* the assessment task, gave them a space to build that framework that we'd been trying to construct for them. And they had to then construct it on paper and get all that stuff out of their heads and compose this document. And I have a feeling when I talk to her, that will be one of the things that precipitated the penny dropping.

Again, GM returned to these thoughts later in that second conversation, further speculating and telling of his students' own curiosity about their learning. He said,

I've got a really strong suspicion that when I do speak to [the student] about her penny dropping that her answer will be along the lines that the penny dropped by doing the task ... I think that that's probably what will come out. She may not exactly say it that way ... But I think having something that they have to construct as a group and pull together all the information that we've been giving them over the last seven weeks and I think that's what made the penny drop. 'Cause she gave me a quick reply email saying: 'It's funny that you should ask that question. We were having the same discussion in our group. What made the penny drop for us?' But she didn't go into any more detail. I have a feeling that that's probably what was the trigger.

To the start of the third conversation, TG brought a summation of the questions and ideas that LL and GM had previously expressed a curiosity in knowing. After some discussion about the collection of ideas, TG asked 'Ok well which point would you like to start at?' The 'penny dropping' idea was one that TG chose to bring into the conversation: 'You know that student that you talked about, [for whom] you thought the penny dropped and you said that it was the assessment task.' GM took the opportunity to elaborate.

Oh I just think that it was similar to last semester with ... some of the concerns that students had in say the first six, seven weeks. That they don't think things seem to be coming together for them and reaching the half-way mark they weren't quite at that stage of knowing where it was all heading to ... they were learning heaps about [a topic]. All of this information I guess about what is a good [result], what is a bad [result], how do you resolve conflict? All these things, which is all very well to read and be told about.

After citing the uncertainty that students expressed, GM then hypothesized,

But then they had the job of writing a fairly substantial document by six people and I think the *doing*. Having, *having* to do something. Having to produce something that you know there was something at stake and they wanted to get a good mark. And it was really their first big deliverable *forced* them to bring it all together. They brought it all together quite well.

TG ventured into exploring what constituted the substantial document; 'so they found that until they did the assessment task it didn't come together, they had to produce'. But GM interrupted, and continued to pursue an earlier question, 'what is it that is difficult to learn?' which he now set about untangling.

GM: I don't know whether it was difficult to learn or whether they weren't quite sure what it was they were learning.

LL: Hm

GM: Would you agree?

LL: Yeah

GM: Yeah. Cause none of it is *difficult* really. It all seems really common sense and logical ... I think it took to the point they had an assignment to bring it out what they were actually learning, how was it coming together. Some of them would say - 'Oh I can see why you've been going on, on and on about [the subject topic] for the last five weeks.'

TG wanted to gain insights into how GM himself could know that students were learning, and how LL and GM might recognize what their students were learning, so she asked,

TG: So what was it that they were learning?

GM: Um [pause] Um. How to put your, well I don't really know. Have to do with, I really can't answer it that simply. I think they learnt a lot of things, lots of all sorts of things.

LL, however, gave details about what learning in the subject entailed,

LL: The subject starts off with looking at skills and experience required for particular roles and tasks within the digital media industry. We then get them to, I start from kind of learning in theory through readings and discussion. We then get them to apply for a role on a project. So they're then having to acknowledge what skills and experience they have and those which they lack for a particular role on the project

TG: And if they do lack skills?

LL: They then address them through the learning contract. So once they come together as a group they develop a group charter, sort of agreement about how to work together as a group, as a group learning contract which acknowledges the particular skills and experience that might be lacking in the group that is needed to complete the project.

So, LL conceived that learning in the subject consisted of knowing the field and its needs, gaining acquaintance with theoretical readings relevant to the field, acknowledging one's personal history and positioning these individual capabilities in relation to the field, and working within a group that supported individual development while also undertaking a collective project. Using LL's learning model, GM took a fine-grained approach, saying,

I think they also learn to recognize and value their transferable skills, things that perhaps they don't know. I mean I don't see that multimedia development, apart from say the technical and the creative side, is particularly difficult. It's fairly commonsense so *most* people have a *good* dose of commonsense in postgraduate study.

Furthermore, he assigned an importance to surfacing what the students knew, in particular, surfacing this together in their groups. He described it in this way:

And it was really sort of saying to them, 'You *have* these skills already, believe me. You've just got to massage the skills to be able to produce the kind of thing you want to produce. And you have to work together as a group to do that.' So I think a lot of them were very concerned that they *had* no exper, no relevant experience – 'It's like you wouldn't be in this course if you didn't have some relevant experience.'

Returning to his earlier thoughts, he now posited, 'I think it's very difficult for students to look at themselves and judge themselves', and then he outlined the design solution he had arrived at to enable what students know to be evaluated for its collective worth:

Which is why we got them to judge each other in a way. And that was quite, quite effective I thought. They were really – 'Oh you've got the best, you've got fantastic skills. You could do this, this, this and this' – where the student wouldn't necessarily. You know it's very difficult to evaluate yourself and go 'I have the skills to go here'. And yet somebody can sit and listen to you and say, 'Oh I think you can do this'. It's easier to give advice I think. But I think that was a really good experience for them.

Though GM and LL had talked about their students' learning within the environment they designed, TG was not able to see first-hand what the students themselves were doing, nor how LL and GM might recognise the learning when it occurred, and she wanted to understand this aspect of their work. So, TG came to the fourth conversation with copies of the students' submitted work obtained by accessing the subject's online environment, access to which LL

and GM had earlier given her. She started the session by saying, 'I've been thinking, some of the things that have come up in conversation, perhaps if we look at some assessment tasks ... looking ... in terms of their learning, what you've seen come through and how that aligns with this [design of the subject outline].' After talking about how students might interpret the description of the assessment task and briefly about how LL and GM understood the subsequent work students produced, TG asked directly where learning might be apparent, using the actual assessments tasks that students had handed in as a reference point (copies of which were on the table around which they were seated). With much to-ing and fro-ing between the subject outline and the students' actual assignments, GM then began a close analysis of one piece of students' work, outlining what he perceived was the basis for why it had received the highest mark. In particular, he honed in on one aspect of that work. As documented in that group assignment, the students had developed their own criteria for a task and then had generated a rationale that described what value they attributed to these criteria. GM noted,

And [for] each of their criteria they've given quite a good rationale as to why they've chosen this criterion. Now that's outside everything that was covered in class, all the readings, this is their own understanding – 'So we're going to have this criterion for these reasons' – and you can see it's come out of the discussions within the group. That we didn't cover a rationale to that depth which is one of the reasons why this got such a high mark, this one.

Thereupon, TG asked GM, 'So do you think it's important that they do include [the rationale] when they're setting up their criteria?' An intertwined conversation followed,

GM: I think it's important that they can show examples of further readings and deeper understanding on.

LL: 'Cause clearly by coming up with criteria they've had to go through a process of reflection as a group, and they've actually demonstrated that whereas others have just listed criteria.

GM: And often ones that I spoke about as being important to know. And that's ok that they stick to the kind of information you give them. But then you come across a paper that takes that information and runs with it even further, or assimilates it and comes up with something more innovative, i.e. a HD level paper.

TG set out to explore why students were creating something outside the parameters of the task objectives for the subject, noting 'it's obviously something that has value, it had value for them as a group. And it shows their thinking, their reasoning'. In parallel, she questioned why students might seek to make their rationale explicit by asking about 'those students that didn't derive something like that, or perhaps derived it but didn't see that they needed to write it down.' After GM skirted around other design possibilities, he observed that 'this is the first time we trialed it so it was a bit new for me as well. So determine your criteria and give us a rationale for those criteria, and I think that would be a good way of doing it, do it next time'. TG, however, pondered over how students might undertake to design their assignment and how a learning environment might assist them to do this.

Do you think the fact that they came up with the idea of the rationale themselves. I'm trying to blend two things, I'm not sure how, the best way, I'm just thinking, sometimes. They've found the path to that and it's obviously something within the course that's enabled them to do it. There's a difference between, I think I see a difference between that and being told to include it. So, I'm just thinking whether, and that's just so subtle, and I'm not sure whether for the students to arrive at that point whether you'd want that or whether you'd somehow tell them.

Subsequently, LL opened out the conversation, describing what she found problematic:

- LL: Well that's the difference between last semester and this semester in some ways we've been a lot more prescriptive this semester. It's sort of a, yeah, it's something I've struggled with with teaching.
- GM: It's a gut feel too sometimes.
- LL: How prescriptive do you want to be? So last semester it was a lot more, I gave them a lot more freedom around how they would do this. But then the things, the sorts of things that we were looking for weren't there. The kind of learning strategies weren't there in their learning contracts. They had all objectives but they didn't tell us how they would go about meeting those.
- GM: It is a bit, you know you talk about teaching as being like signposting, and it is like that. I mean you're here and the sign is down there. How you get to it is your choice but you've got to end up there or somewhere near there. Rather than saying take one step
- TG: Or past it.
- GM: And then the next step, and then the next step.

After having noted some of the ideas that underpinned their design choices, GM captured the development of his own thinking, starting with his initial response to the students' work and his recognition of its worth,

I just remembered reading it, going 'nice touch' ... like it showed me that they had some deeper understanding as to why they would pick these criteria and why *have* criteria in the first place ... Because I did have a, I felt like I was having trouble getting that idea across in class. Then I read this, I thought they've really understood why we're having this this time. And I think it's so beneficial that I would include it as a requirement next time. You need the rationale [as to] why you picked these criteria.

LL also put her own spin on these design ideas,

I can see a benefit of having it as a requirement now. And the way I see it now is that we're just giving them more pieces of the jigsaw and they can put it together the way they see fit. Whereas if you don't give them some kind of guidelines or signposts as [GM] said then you're more likely to end up with a wider range of high quantity, low quality whereas I think they're much closer together this semester.

And so the third and fourth conversations continued, as GM and LL explored criteria on which they based their evaluation of students' work, and TG pressed them with questions, to try to gain an inner view of how these criteria might be recognised by GM and LL in what students produced.

Concluding Conversations: Distilling facets of professional work in Education

The fifth and sixth conversations took a step back from the work of the previous conversations. First, the participants wandered serendipitously into a conversation about research from which they subsequently distilled the dimensions of their professional work. Then, in the final session, the participants looked back over the series of conversations and refined the design of the subject. Also, LL explicitly made note of some of the institutional constraints that influenced how they developed the subject, recognising that the conversations had not explored these in any detail. We turn now to briefly describe the progression in these last conversations.

As already noted, in the fifth conversation, participants seemed to stumble fortuitously into talk about research and its connections to teaching, designing and learning. GM had dashed to get a cup of coffee leaving LL and TG to converse casually about general academic matters. But when talk shifted to areas of doctoral research and seemed pertinent to capture in light of

this inquiry, TG asked if the casual chat could be audio taped. LL backtracked slightly when the recording began, to enable the lead-in to be collected as data also. She talked about her own experience of doctoral research. TG asked what the data of this current inquiry was revealing to her as she was reading through the transcripts and participating in the investigation. According to LL, it was the way in which the inquiry was designed, that made it 'quite hard' for her to both participate and be a subject, alongside the exploratory nature of having to shape the research sub-questions. Explicitly revisiting her original agenda of knowledge generation, she added:

I'm finding it a bit fuzzy at the moment in terms of where, how we can generate something out of this. Because obviously one of my, one of the things I want to get out of this, as I've told you, is some sort of formal knowledge, you know, [a] formal product, be it an article or whatever that we can then present as a kind of knowledge dissemination.

TG pressed on to pursue what LL might be considering could be generated from the present inquiry, taking into account her own interests and the initial sub-questions she had put forward. TG wanted to know if this had changed in any way during the series of conversations.

LL: I think a number of things can come out of it because we have generated so much data and I've picked up on certain points that you've mentioned that I think are really important and they're sort of, they're departure points from which we could jump off. The idea of teachers as researchers, I think is a really good departure point.

TG: And what do you think that has to say?

LL: I think it's a really, it might be simple point that can be sort of elaborated, that teachers are researchers, you know we've had sort of a short conversation about that.

As the question of teachers as researchers was something that TG herself had grappled with in her Masters studies, she was eager to hear what connections LL would make, and so worked to continue the exploratory interchange. By this stage GM arrived to join them. He added:

And that idea of teachers as designers I like that too, not designers but constructors.

Having heard LL's comments, GM now also revisited his earlier ideas, reminding TG and LL of his online message on the discussion board, posted two days after the third conversation. In that posting, GM had engaged with TG's earlier thoughts about the role of the teacher and had set out the following three dimensions of a teacher's professional work:

teacher = facilitating, knowing your audience etc

designer = subject structure and objective, assessment design, determination of assessment criteria

researcher = keeping subject matter current and fresh, responding to student's mood/feedback, improvement strategies and professional development

But TG chose to continue with LL's line of inquiry. Referencing GM's online posting (a copy of which was, with other materials, on the table) she asked LL:

So teachers as researchers ... where do you see the research part of that? I mean GM's seen it as, and maybe you can elaborate on that in a minute, seen it from that perspective [*pointing to the hardcopy of the online posting on the table*].

Picking up and extending GM's ideas about the importance of currency, and the interrelatedness of teaching and professional learning, LL responded,

Certainly keeping abreast of latest developments I think is not only part of a teacher's responsibility but also a researcher's responsibility. Knowing what kind of ideas that are circulating, contemporary ideas that are circulating in the public domain about whatever your subject area is, but also about teaching and learning, that's your area. But in the teaching process you are also learning and that's part of the research process as well, that you are learning and developing and making a contribution to the field.

Using GM's framework, LL walked through her own views, noting the similarities between teaching and researching.

But teaching is always seen as kind of a small contribution to the field as opposed to research which is more formal a kind of contribution, a more widely accessible contribution in that the product is read in journals or wherever. Whereas when you're teaching, whatever the product of that is, tends to be less tangible.

Even whilst acknowledging the parallels between the two processes, LL was at the same time to highlight the differences in the values attributed to the two practices. The gap that LL observed prompted TG to ask whether she thought that teaching and research 'could be brought closer together?' LL replied adamantly:

Absolutely, but I think you have to integrate. It requires more work in terms of integrating your teaching and the research part. I mean, the research part is hard because you're always mulling over those questions, trying to make intangible issues tangible, trying to resolve them on paper, say something that hasn't been said before.

In an attempt to elicit an even clearer view of how LL saw this teaching-research relationship, TG folded back LL's ideas about integration, asking,

TG: ... can you pull out or can you see anything in what's happened [in the subject] over this year that you can take that sort of [research] perspective on?

LL: I think what we've actually talked about in our conversations I've never really seen written anywhere in a journal. I've read literature about incorporating technology in learning situations, about computer mediated learning, computer based instruction, or *all* that sort of thing. But it's either very technology oriented or, and doesn't take into account the wider issues around teaching and learning. Or ... it's more theoretical about theories of teaching and learning, minus the technology.

Here, LL told of how the work of these conversations had elicited experiences and work that she thought might constitute an original contribution, at least compared to what she knew of research within the field. Then, trialing these ideas, LL and GM ventured into talking about how they made improvements to the subject, how they were creative in developing the subject. TG wanted to know about what shaped or anchored the changes they were making and she asked,

TG: So what's driving the changes do you think? ...

GM: Um I guess it's the subject matter somewhat. But that's not the only answer, 'cause that's the easy answer to say: 'Oh because we're dealing with digital media it's always changing.' But doesn't change that fast. The principles don't really change.

LL: Students.

GM: Students and their expectations, the audience. The fact that students are part of the greater society that is changing in its perception of digital media very quickly. So it's more about audience change than product change ... their experience level with what you're teaching them changes. Usually gets higher so you've forever trying to keep afresh with it.

TG was also keen to understand how these thoughts might relate to the professional dimensions of their work which LL and GM had previously identified,

TG: ... so how do you think the research aspect might connect to what you were just saying [about students and their expectations]?

GM: I guess being new ... to teaching ... I see that knowing the subject matter is important, but perhaps not the first thing on the list. I think being able to design the experience for students of learning ... and it's not one thing it's just this constructed experience you create for students over the course of a semester. *That* I'm interested in. How you change that construction. How you change the design of it to keep it appropriate to the audience you're dealing with that particular semester – to make it better, a better experience, a more flexible experience ... Keeping yourself excited too, keeping it fresh for you ... And each time you spot things that you think 'Oh I don't like, I want to change that.'

Subsequently, GM recognised an aspect of his teaching he felt he needed to learn, to which TG asked, 'and what clues have you, do you think you might have gotten into that so far?' GM then described the ways in which he had sought to find out what he did not know, about his experiences of what wasn't working, about the questions that were arising for him about students' learning, and about his speculations as to what might work. However, LL interrupted his thoughts, saying,

LL: I think that reflective process is very much part of ... I see it as part of the research element of teaching. I know that in ... teaching and learning literature, reflection should always be part of good teaching practice. But I see that reflection part as being the researcher part of ... [the] research part of teaching, so I don't actually

GM: Sometimes it's on-the-fly research isn't it?

LL: Yeah, yeah. I don't see ... them being mutually exclusive roles. I see it as very much, as integrated.

GM: I mean I would see research in its true sense as being quite [a] slow laborious process, bit inward looking sometimes. Gather ... go out gather information but bring it inside and then analyse it internally. But I think research in teaching is a different kind of research. It's a more on-the-fly, from-the-hip, kind of thing. React quickly, analyse data really quickly and respond quickly, accordingly. But over time you create, you effect change and you come to realizations about why you do it.

TG: Can you see any way that it connects ... that it also fits in to what [LL]'s been saying?

GM: In regards to what? In regards to, [LL] what were you saying?

LL: About teaching and research being integrated.

GM: I think it's exactly right.

LL: What I was going to say is that, that's one of the unique things about educational research ... every time you go into the classroom, the lecturer is, you are collecting empirical data ... I suppose in a more traditional research setting you go out, you collect your empirical data, and as [GM] said, you kind of sit in a dark room and you analyse it. But as a teacher, *every* time you go into that classroom, every time you have a conversation with a student, that's empirical data which

GM: You walk away from that student reflecting on how that conversation went. 'Should that have been done better?' Not every time but sometimes. Then after every lecture I go home, I can't sleep for hours. So hyped up, I replay the whole thing in my mind. Then, 'Should have done it that way' or, 'Gee I really wish they'd respond, got to, got to work on that', for my own sanity. So yeah ... it's really quickly, on-the-fly. You don't sort of sit down and go 'Right, let's ponder this'. You just don't have time.

So both GM and LL were starting to conceive of research and the generation of knowledge as occurring in the place where it is used: in their practice of teaching itself and in their designing of learning environments.

While gathering their belongings and packing up at the end of this fifth session (with the tape recorder turned off), the participants continued chatting. As LL had expressed an interest in reading papers in the e-learning field and the work TG was undertaking, TG, in knowing that LL had a young son and would be involved in observing his developmental changes, recommended the video 'The man who made up his mind' to LL. Gerald Edelman's work was briefly mentioned before talk shifted to Esther Thelen's segment in the video on development in children. A conversation about learning emerged, to which TG quickly turned on the tape recorder to capture LL saying,

I'm trying to make the connection with what *we* do. I'm just thinking there's got to be, there's got to be, you know. Is it that suddenly you reach age 5 and you move into this other kind of universe of learning?

GM disagreed with this, 'No I don't think that's the case actually' and at the same time that LL started to fire back a challenging question, he was heard to whisper 'we're probably exactly the same'. LL continued the conversation, recounting what seemed to be her own deliberations about the very active, physical nature of learning as she saw it through the experiences of her young son. Though GM had asserted that there wasn't a difference between how all ages learned he seemed then to concede that there was a gender difference, stating: 'I think men and women do learn differently'. LL then questioned the connections between how learning naturally occurred and what they did as teachers in higher education:

Yeah so if that's the case how can we bring that to what we do? Because often we do, apart from the activity-based stuff, but university is all about lectures and tutorials where you chalk and talk.

GM, though, pursued his earlier view that gender influenced learning by seeming to expound the differences of how men and women 'take knowledge in differently', and that this 'changes the way they assimilate values and knowledge and that kind of stuff'. At that point, an interruption to use the room the participants were in caused a halt to this conversation about learning and how it might occur over the lifespan.

Then, in the last conversation, participants revisited what constituted the subject that LL and GM co-taught. At one point, LL outlined how she thought the students undertook the learning process as a journey: 'They're going on a journey. They're picking up a piece here, picking up a piece here [*drawing the pieces as subject components on the paper*] and you know it's not necessarily a logical process'. GM interjected with 'And they don't all follow the same paths'. LL built on these ideas:

I see it more as pieces of a jigsaw that they're picking up along the way, and as [GM] says they take different paths. They might pick this one up first, this one up first [*indicating the parts on the diagram that she had just drawn*], second, third, fourth...

and then they sort of get to the end of it and they say ‘Well what can we do with this? How can we put it together?’

This idea of what students might be doing prompted TG to ask: ‘OK, so as they’re picking up the pieces on the way, what are the pieces?’ The participants then drifted into figuring out what the components were that made up the subject and subsequently into exploring differences of what happened when students moved into spaces of knowing and not knowing, into looking at linear structures and organic pathways. The conversation opened out in this way:

LL: They’re also at, there’s something, even though it is a linear structure, it would be good to be able to give them say, I don’t know, those fourteen, say fourteen blocks [that make up the weekly lectures] and to be able to move those blocks around. But there’s something, it’s very difficult to do that. I wouldn’t have the first, I

GM: Actually it would be an interesting exercise to have all the various components. Things like [the different subject components] written on a piece of paper, written on cards, and when they’re in their groups, say to them ‘OK guys, you’ve got all of these components here. You have to piece them together. Give us an over, give us, give us the story of *Digital Media Development*.’ You know, put them on, stick them on the wall, do a dotted line, draw connected lines, connect the different areas, issues, that kind of stuff. I bet

LL: Would be int

GM: Yeah would be interesting. I bet each group comes up with a *completely* different picture, which is great.

After the participants shaped this new design in the subject through quick, animated interactions, GM and LL brought the exploration to a conclusion by reminding themselves:

LL: Yeah we should really keep

GM: We must remember that.

LL: We should do that.

Discussion

We argue that what occurred here in these conversations can be characterised as selection, in fact, categorisation, in operation: a paradigm example of selection. It is a case in point of the dictum:

To survive in its econiche, an organism must either inherit or create criteria that enable it to partition the world into perceptual categories according to its adaptive need (Edelman, 1993).

Here, as conversations evolved, it became clear that they were eliciting over time the facets of how these participants were categorising and recategorising their professional work in Education – elaborating the complex ways they were shaping their thinking about teaching, learning, designing and researching.

GM came to these conversations with an instructionist concept of learning: for him, the teacher drove the learning process using transmissive approaches. Yet he was struggling with the inadequacies of such a view. For example, he questioned whether learning entails memorisation or pattern recognition; how to account for the personal, individual, unique ways in which learning is internalised; how students generate understandings outside of his instruction; and whether that new knowledge would drive the subject design. He recognised from his own student experiences that he personally disliked such instructionist teaching

approaches; and as a learner he was operating in ways not in tune with his teaching. He was to argue for learning being the same process across the lifespan, prodding LL to ask what the implications of such a concept of learning were for their teaching. Instructionist approaches also did not address the reasons that both GM and LL perceived they needed to change their students' learning environment: for example, changes in students' expectations and their level of experience in a dynamic world, and the changing cultural perceptions of digital media.

LL was also inquiring into her own concepts of educational research. When LL participated in the informal, unstructured approach of this study her ideas of what constituted research in Education were challenged. The present investigation had a 'free forming' nature: individuals participated in shaping the study moment-by-moment as well as being subjects. Fertile avenues of inquiry emerged over time in collectives. She noted similarities between how the practices of teaching and researching were undertaken. These features enabled LL to review her previous questions from a different perspective, and to move to a more powerful concept of educational research. So, she placed knowledge generation directly in the context in which it was used: contexts that were messy, fuzzy, involving 'on-the-fly' decision-making. She appeared to be advocating a research-based approach to teaching as it operated in everyday practice.

By the last conversation, we see the ways in which these new professional categories play out for LL and GM. Here, GM has redesigned their subject so that students can make explicit their own ways of carving up the field under study, and so make visible to their teachers how these concepts may change over time within the designed learning environment: he is investigating the question 'what might shift the students' ideas and why?'

Implications

In essence, the importance of this study lies in the synergy between neuroscientific and educational views of categorisation that it achieves. We can recognise, for the academics in this group, a distillation over time of ways of thinking about their professional life, a process we can describe and explain consistently with these neuroscientific insights, but at a level of explanation appropriate to Education as a discipline. So for us, this story is deeply biological. Initially, participants came with their own agendas, their own personal ways of partitioning the world. (For example, LL brought her life's experiences of ethno-cultural ways of perceiving research practice, and contemplated carving up education research in the same manner). Participants found themselves in environments in which they operated according to particular pressing needs and in interaction with diverse groups across different contexts. (For example, even though GM sought to use his practice-based experiences to drive how he designed the subject, he was also aware of repeating the ways in which he had previously experienced the subject as a student). As they made their niches, we believe their partitioning was shaped and shaped again by criteria which hedged the chances of a successful fit: through iterative, communal progression of their ideas on value. (For example, by means of these professional conversations, LL and GM explored their ways of thinking about teaching against their observations of the dynamic nature in which students and the digital media industry operated, as well as their own learning as professionals working in this emerging field, and they subsequently re-designed the subject to respond to these changing conditions).

Of course, this study does not enable us to see what GM and LL actually do in their regenerated practice or how their ideas in these conversations inform their professional work. Also, the resource intensiveness of this approach is not addressed here, although our study may begin to provide design parameters for using technological means of supporting such professional development opportunities. Follow-up investigations would need to be undertaken to gain such insights. Nevertheless, a view of categorisation as selection as we

have described here fits comfortably with other contemporary ways of thinking about it. For example:

- Tononi (1994) views categorisation in these terms: ‘The world is certainly out there, but the way it is perceived, the way it is categorised, depends very much on the organism which is doing that job.’ On this basis, individuals make contact with their biological and cultural world: an academic’s own personal history and interests drives these points of interaction and shapes unique agendas.
- According to Lakoff and Johnson (1999) living things must categorise. We are neural beings with brain architectures that shape what we can think about and that are shaped, reciprocally, by our experiences in the world. Our categorisation is therefore inherently embodied (Lakoff, 1990). In relation to the emergence of a self, Stern (1985) describes that ‘From birth on, there appears to be a central tendency to form and test hypotheses about what is occurring in the world ... [to] categorize ... into conforming and contrasting patterns, events, sets, and experiences’ (cited in Sacks, 1999, p. 61-62). In other words, ‘categorisation ... is an epigenetic developmental event ...[requiring] experiential selection’ (Edelman, 1992, p. 94). As individuals interact with their environments, they bring their own developmental histories to what they perceive, to what they can do and make, evaluating for worth, for example, as ‘a conversation with the materials of a situation’ (Schön, 1991, p. 78), with technologies (Ackermann and Strohecker, 1999) and within groups (Forsyth and Schaverien, 2004).
- Edelman (1992) states: ‘We categorise on value.’ Sacks elaborates on this view: it is up to a (human) organism to ‘create its own categories and to use them to make sense of ... a world ... its *own* world, a world constituted from the first by personal meaning and reference’ (1999, p. 61). This categorisation is a mechanism for learning, the means by which learning occurs on a wash of evolving and evolved values to result in adaptive fit (Edelman, 1992, 2004). Similarly, on a scientific realism account, learning theories are generated and tested *in situ* against the aims of truth, explanation, prediction, control, and testing occurs on a wash of epistemic values: unifying power, internal coherence, external coherence, predictive accuracy, fertility, simplicity (Fletcher, 1995, p. 52).

More recently, a biological basis for category learning is becoming even clearer, including its connections with how memories are being laid down in the learning process (Ashby and O’Brien, 2005). As well, it is now becoming apparent that ‘humans [may well be] ‘designed’ for dialogue rather than monologue’ (Garrod and Pickering, 2004, p. 8) and that ‘dialogue (holding a conversation) ... [may well be] easy because it takes advantage of a processing mechanism’ (Garrod and Pickering, 2004, p. 8). Our biologically based conceptual framework is in tune with this recent research into the biological basis for understanding language use, and in particular, conversation (Garrod and Pickering, 2004; Pickering and Garrod, 2004), and category learning (Ashby and O’Brien, 2005).

Our study progresses the ways in which we, in Education, understand conversation as a medium for professional development. Our analysis illuminates how we might recognise if professional conversations are developmental and when learning occurs. In this way, we are attempting to move beyond only describing the conditions that enable such conversations to flourish.

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