A longitudinal study into the transformation of a university teacher's conceptions of, and approach to, elearning

Karen M. Scott
Discipline of Paediatrics & Child Health
The University of Sydney

In seeking to meet the demands placed upon them, many universities are increasing their use of elearning. At the same time, a good deal of research is being undertaken into academic practice using elearning. The research reported in this paper is a longitudinal case study that examines one teacher at The University of Sydney, Australia, as he transformed in his conceptions of, and approach to, teaching using elearning over two years. This research forms part of a larger project with embedded case studies focusing on teachers from the Health Sciences and related disciplines. Data for this case study was collected between February 2007 and December 2008 through semi-structured interviews with the participant and observations of the participant's elearning resource. The findings demonstrate that as the participant worked with his elearning resource over two years, he transformed the resource to improve learning and teaching. Through the process, he transformed his conceptions of, and approaches to, elearning, as well as his lesson image. He also came to understand the learning needs and styles of his students and their approaches to elearning. The research provides insight into the role of reflection and support of university teachers in their use of elearning.

Keywords: conceptions of elearning, approach to elearning, health sciences

Introduction

The quality of academic practice has become an important issue internationally. Universities are under pressure to improve the quality of learning and teaching (Bowden & Marton 2004), especially where governments tie funding to teaching quality (Ramsden 2003). Yet another pressure comes from the current 'Net Generation' students, who expect a blended mode of face-to-face and online learning and teaching (JISC 2007). This is occurring when universities are adjusting to the changes entailed by mass higher education (Biggs 2003; Scott 2000), with larger class sizes and students with mixed abilities (Ramsden 2003).

A range of research and scholarly writing has been undertaken to improve the quality of learning and teaching: Marton and Säljö (1976) introduced the concept of deep and surface approaches to learning, to which Entwistle *et al.* (1979) added a strategic approach; Trigwell and Prosser (1997) researched teachers' conceptions of, and approach to, learning and teaching; Entwistle *et al.* (2000) have shown how these can transform over time; and more recently Postareff *et al.* (2008) have highlighted that teachers can hold dissonant conceptions of, and approach to, learning and teaching. Additionally educational researchers from a cognitive science perspective, such as Schoenfeld (1998) and Calderhead (1991, 1996), have researched teacher beliefs, knowledge and lesson image, and how these may change through reflection (Kember 2001).

In seeking to meet the demands placed upon them and improve student learning, many universities are increasing their use of elearning (Ellis *et al.* 2007). Goodyear (2005) and Laurillard (2003) recommend university teachers modify their approach to elearning to provide quality online education. In an effort to achieve this, a good deal of research is being undertaken into teaching using elearning, including lesson design patterns (Goodyear 2005), conceptions of, and approaches to, elearning (Gonzalez 2009), teachers' reflections on their use of elearning (McShane 2006), teacher beliefs in teaching using elearning (Steel 2009) and teachers' experience of their first year of teaching with elearning (Ham & Davey 2005). However, to date, there has been little research looking at transformation of teachers over time in these areas. The research reported in this paper examines how one teacher at The University of Sydney transforms in his conceptions of, and approach to, teaching using elearning over two years. The following section outlines the theories underpinning this research in more detail, namely: conceptions of, and approach to, learning and teaching; cognitive science; and elearning.

Background

Conceptions of, and approach to, learning and teaching

In 1976 Marton and Säljö introduced the concept of deep and surface approaches to learning and through their research, showed that deep approaches to learning were associated with higher learning outcomes. Building on this work, Biggs (2003) developed the SOLO (Structure of the Observed Learning Outcome) taxonomy to assist university teachers in encouraging students to adopt a deep approach by providing learning opportunities at advanced levels of understanding. The taxonomy describes the way understanding develops, moving from finding out about facts to more advanced, abstract levels of understanding. Bowden and Marton (2004) have substantiated Biggs' findings that student approaches are influenced by the learning environment and state that "only by changing the learning environment will a university have reason to hope that the majority of its students will approach their learning in the manner desired" (p.62).

Trigwell and Prosser (1997) have found a hierarchical nature in teachers' conceptions of, and approach to, learning and teaching, moving from a content- to learning-focus. They also found that teachers may change their approach to teaching according to the students and context, and that there is a parallel between the hierarchies of conceptions of learning and conceptions of teaching. Entwistle and Walker (2000) and Entwistle *et al.* (2000) found that conceptions of teaching develop over time and follow a developmental sequence, moving from content- to learning-centred. In addition they found that the changes in teacher beliefs resulted in changes in approach to teaching. Furthermore Trigwell *et al.* (1999) have found that a teacher's approach to teaching is related to his or her students' approach to learning and that there is a relation between the approach to teaching and the quality of student learning outcomes. Recent research by Postareff *et al.* (2008) has highlighted the fact that teachers may hold consonant or dissonant conceptions of, and approach to, learning and teaching. Moreover, they showed that dissonance is common during a teacher's transformation from a teacher to a student-centred conception of, and approach to, learning and teaching.

Cognitive science

Further insight into the conceptions and approaches of university teachers can be gained from studies by Schoenfeld (1998), Calderhead (1991, 1996) and Leinhardt and Greeno (1991), which highlight the interaction between teachers' beliefs, knowledge and goals, and how this influences their decisions about teaching. In addition Schoenfeld (1998) found that teachers' envisioning or "lesson image" influences what takes place in a lesson or course. This includes predictions about how students will react to a lesson, what they may have difficulty understanding and how the teacher may be able to help. Another influence on teaching activities stems from teachers' prior experiences (Yinger & Hendricks-Lee 1993). Calderhead (1996) terms this "craft knowledge" and defines it as "the knowledge that teachers acquire within their own classroom practice, the knowledge that enables them to employ the strategies, tactics, and routines that they do" (p.717). When learning to teach a new topic, Calderhead (1991) claims teachers need to modify not only their subject matter knowledge, but also their procedural, or craft, knowledge and that this requires "more than simply mapping new subject matter knowledge onto existing procedural routines" (p.271).

Furthermore Calderhead (1984) and MacAlpine *et al.* (1999) have found experienced teachers may modify their teaching plans due to lessons learned from previous teaching and/or to suit a new context

and students. Calderhead (1996) claims planning therefore includes reflection following teaching and may include an analysis of what has been taught as well as thoughts about the implications for future teaching. The importance of reflection for teachers is also noted by Ballantyne *et al.* (1999), who strongly recommend university teachers "reflect on the assumptions and values underlying their teaching and… take action to improve their practice" (p.238), rather than continuing with teaching methods without re-examination. In his research into reflective learning and teaching in the health professions, Kember (2001) concludes "reflection operates at a number of levels, the highest level of critical reflection necessitates a change to deep-seated, and often unconscious, beliefs and leads to new belief structures" (p.174).

eLearning

The role of reflection on practice (Schön 1991) in the development of conceptions of, and approach to, elearning is highlighted by Torrisi-Steele and Davis (2000 p292), who also state that "the development of online material must be considered as a developmental process that 'takes time'". Goodyear (2005) notes the iterative nature of the educational process, which moves in a cycle of articulating teaching goals and educational design decisions on resources, student management and learning tasks, with frequent backtracking to clarify and revise ideas. He highlights the importance of teachers' philosophy and pedagogical strategy and links these with the educational environment, activities, people, resources and learning outcomes. Roberts (2003), however, found most teachers used the Web in the traditional information transmission mode and few used an interactive, iterative approach recommended by Goodyear (2005), Torrisi-Steele and Davis (2000) and Laurillard (2003). She emphasises "that it is *how* the Web is used that will reflect [a teacher's] conception of, and approach to, teaching" (original emphasis) (p7). Applying Roberts' research to postgraduate education in the health sciences, Gonzalez (2009) has found three main conceptions of, and approaches to, elearning, arranged on a continuum: one in which students individually study materials provided by the teacher, a second in which students participate in online discussions set up by the teacher, and finally one in which students share & build knowledge through networked learning, guided and facilitated by the teacher.

McShane (2006; 2004) has found the development of elearning resources challenges teachers "to think consciously and carefully about their content and processes, and their teaching roles in those processes" (2004 p9). Furthermore McShane found values and beliefs to be influential in developing elearning resources and "the integration of online components means that planning and teaching become more (self-) conscious activities… [that] can develop into a confronting reflexivity" (2004 p14). Moreover teachers' beliefs about the roles and relationships of learners and teachers have been found by Caroline Steel to influence the way they design and implement their course websites (2009; 2006). This supports the research of Bates and Poole (2003), who found that academics select and use technology depending on their beliefs about knowledge, how they think their subjects should be taught and the way students learn. Similarly, through action research of their initial experiences in elearning, Ham and Davey (2005) realised they needed to develop their pedagogical beliefs and not merely their technical skills for teaching using elearning.

Methodology

The larger PhD research from which this case study is reported is comprised of six embedded case studies focusing on university teachers from different areas within the Health Sciences and related disciplines at The University of Sydney. All teachers in the case studies developed an elearning resource for their unit of study and implemented it for the first time in 2007 or 2008. This paper presents the findings following preliminary analysis of one of the participants, Harry (name changed). The research questions are: 1) How do the teachers alter their elearning resources and the way they are implemented over two semesters; and 2) Do the teachers' reflections on the alterations affect their conceptions of, and approach to, elearning? Approval was granted for the research from The University of Sydney Higher Research Ethics Committee.

According to Yin (1989), case studies are "the preferred strategy when "how" and "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (p13). A qualitative approach has been taken because this "emphasises the human factor and the intimate firsthand knowledge of the research setting... [and] emphasises developing insights and generalisations out of the data collected" (Neumann 2003 p141 & 137). The research uses a longitudinal research design over two years to "interpret an

_____

individual's status in terms of their own past growth, and pick up many of the variations and individual differences in developmental progress" (Burns 2000 p570). To improve the validity of the study (Burns 2000), data from the individual case studies has been collected using multiple forms of evidence: interviews of participants and faculty elearning support staff, observations of elearning resources using an analytical tool based on Biggs' SOLO taxonomy (Biggs 2003) and analysis of unit of study documents, thus ensuring triangulation of data. Semi-structured interviews of 40 - 50 minutes have been conducted four times with each lecturer: at the beginning and end of the semester in which the resource was first implemented; and at the beginning and end of the second implementation, as depicted in Figure 1.
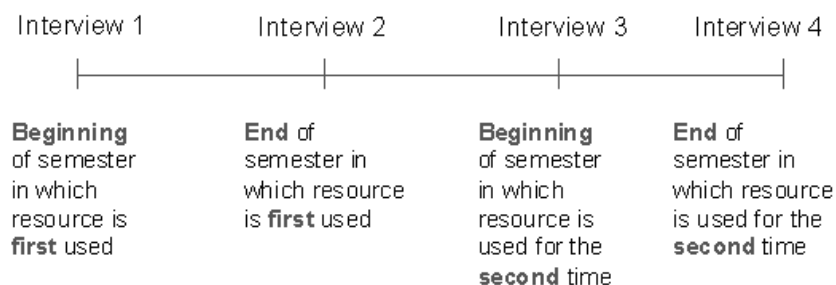

Figure 1: Interview timeline

Findings

Harry developed an elearning resource to prepare students for a practical component of the unit of study and related assessment tasks, and to replace the practical for those unable to attend. Harry received assistance to develop his elearning resource from the university's elearning development unit and a faculty IT support staff member. The elearning resource contained an overview of the practical, which was divided into eight components, images related to the practical, a software tutorial and a link to a generic writing support site. This section will outline the tranformation in the elearning resource, as well as the dissonance that occurred during the transformation of Harry's beliefs and conceptions of and approach to, learning and teaching using elearning.

Beliefs in learning and teaching

Harry's student-focussed approach to learning and teaching advocated the importance of face-to-face teaching, social networks, active involvement and student independence. The following excerpts from the first interview, held at the beginning of the first implementation of the elearning resource, illustrate this:

> I quite like the face-to-face teaching. A lot of these units have less than fifty students… you can do face-to-face stuff still and enjoy it; it's not like you have to have the mass delivery. (Interview 1 - i1)

> Being second year students at the start of their second year… they have often still picked up some of the habits that you pick up from being in the very large classes in first year and they probably haven't got all the characteristics of being independent learners that you might want. (i1)

> One thing they often don't have is just a strong social network of people in their classes so the [practical] is a really important thing for getting out for a couple of days and doing… some hands-on things and the students getting to know each other. (i1)

Harry began using the elearning resource in a manner that was dissonant with his belief in independent learning, in that he controlled the release of course content to students at a number of pre-determined dates. However, he changed this in the second implementation and says in the third interview, held at the beginning of the second implementation of the elearning resource:

_____

> We're just going to release [the eight components] all at once and students can work through it at their own pace. I think we didn't do that last year because one of my colleagues was keen to release it sequentially… and also just the perception that it's harder for students to see the big picture when it's released from the germ of the idea through to the final bit. I think students like to get… everything at once. (i3)

Nevertheless, Harry considered that his beliefs and values about learning and teaching had not changed over the two years in which the research was conducted. He commented in the final interview:

> We've spoken four times now. I haven't changed much, I think, in those four times. Oh, yeah, so you always get, you tweak things a little bit, but I'm pretty comfortable with the different styles of learning and the ways you need to modify your teaching to help people. (i4)

Many of Harry's beliefs and values did not change ostensibly. However, the opportunity for reflection over two years and student demand for change resulted in a transformation in Harry's beliefs as a teacher and his conceptions of, and approach to learning and teaching with elearning, as outlined below.

Beliefs in elearning

Harry was opposed to fully online courses. He commented in the first interview:

> I am really sceptical about stand-alone online things if courses don't have a face-to-face component with an enthusiastic teacher coupled with it. (i1)

Consequently Harry resolved to ensure the elearning resource never replaced the hands-on practical. In the first interview he said:

> I want to make sure they don't replace the [practical] with the online resource. That's probably because we are old school and with respect to what we are thinking they are going to learn… We haven't really set it up as a stand-alone independent sort of thing; it's been set up primarily as a support. (i1)

However, this contradicted one of the aims of the elearning resource, which was to replace the practical component for students who could not attend. Harry's scepticism of elearning continued throughout the two years of the research. In the final interview he stated:

> I'm probably more convinced now that [elearning is] only ever going to be a support for many of the things that I teach. So I think we need to be really careful that we avoid too much shallow learning from our guys. I think non-face-to-face stuff probably encourages that more than we think. (i4)

Despite maintaining his scepticism about fully online courses, Harry became less resistant to it if used as a support for face-to-face teaching. He explained in the final interview:

> I'm probably not resistant to the IT sorts of things, I probably was about four meetings ago, but I'm probably more convinced now that it's only ever going to be a support for many of the things that I teach. (i4)

Thus Harry became more open to elearning throughout the course of the research, however, he maintained his scepticism in favour of a strong commitment to interacting with students through face-to-face teaching.

Beliefs in student approach to learning

Harry believed his students preferred to take a deep approach to learning, although he considered this strategic. He thought this conflicted with some rote learning that was necessary in his discipline and explained in the first interview:

It's just harder to sell to the students because they are all pretty big picture now… Well, big picture provided the big picture meets the assessment requirements. (i1)

However, Harry was inconsistent in his beliefs about his students' approach to learning and oscillated between his beliefs and values on one hand, and a desire to meet student learning needs and expectations on the other. The following excerpts from the first and third interviews, held before the students had used the elearning resource for the first and second time, highlight Harry's belief in his students as sophisticated learners of the Net Generation, capable of selecting what they need from the elearning resource:

They are pretty savvy so they will work it out pretty quickly what they need to do or not. (i1)

Your average 18-to-21-year-olds now are used to dealing with information overload. (i3)

In contrast the following excerpts from the second and fourth interviews, held after the students had used the elearning resource for the first and then second time, reveal that Harry realised his students were struggling with the content in the elearning resource:

There is a fair bit of detail once you click through [the resource] and it can be quite overwhelming for an undergrad to see it... There is a lot of stuff there that is relevant but it's peripherally relevant. (i2)

A lot of the students cope very poorly with being given too much ownership to start with and it's hard to work out what goes in and what goes out. It's much easier when you're told that you need to learn these three things for the exam. (i4)

At the same time, however, Harry was critical of students who needed to have "things signposted and marked out for them" in their learning activities. In the third interview he said:

Micromanaging… I think our students expect an awful lot of it now. (i3)

Harry therefore displayed dissonance in his beliefs about student approaches to learning. Student feedback after each implementation reported the need for clearer alignment between content and assessment, which Harry acknowledged, however, he viewed this as a demand for 'micromanaging' on the part of the students.

Beliefs in student approach to elearning

Harry was aware that students are accustomed to elearning. In the first interview he claimed:

How do they learn? Culturally I think students now are so attuned to learning stuff or getting information via the Web that static things are quite reasonable now for people to browse through and read through. (i1)

Over the course of the research, Harry became aware that his students had an expectation of elearning in the unit of study. This was further impetus to develop the elearning resource, despite his interest in face-to-face teaching. He stated in the third interview:

I'm probably just more comfortable with the opportunities and probably the demographic are very much needing it now or wanting it: the expectation of the providers. If I had a choice, I think I probably would have invested more time in fixing up the [face-to-face field trip] materials rather than the online component. (i3)

While Harry acknowledged his students' familiarity with elearning at the beginning of the research, his belief was that students would use elearning for peripheral learning to "browse and read through". In contrast Harry's comments before the second implementation show his beliefs were changing as he began to realise his students' learning needs and "expectation" included the need for a more integral form of elearning in the unit of study.

Goal: Conceptualisation or assessment?

At the outset of the research, Harry's primary aim was for the resource to help his students conceptualise the practical component, as illustrated in this excerpt from the first interview:

> The eight components are basically conceptualising it from start to finish. From looking at what you want to do, what your aims are, [doing the practical] and writing about it. (i1)

Nevertheless during the first interview Harry acknowledged that assessment drives student learning and that students need to see a link between learning resources and assessment. He stated:

> Obviously with students being keen on seeing how assessment links to it or learning links to assessment and they realise we think it is important, so there is a large assessment task that has been [taken] from the [practical]. (i1)

However, after the first implementation of the elearning resource, Harry realised that while the students liked it, they wanted specific links between the resource and the assessment task, and that this would help them meet the learning objectives. He explained in the second interview:

> It helped but it didn't help as much as it could have… The short way would be that it didn't help them with their assessment as much as they would have liked, which probably would [have] ultimately helped them meet their learning outcomes more effectively. (i2)

By the beginning of the second iteration, assessment began to take an increasingly important role in the elearning resource, coupled with conceptualisation of the practical. In the third interview Harry said:

> We've integrated some of the assessment tasks with the things that are on the website, which is about conceptualising [practicals] essentially. (i3)

Following the use of the elearning resource for the second time, Harry acknowledged the need for stronger links between the assessment and the activities in the elearning resource to motivate students to use it. He commented in the final interview:

> Been basing the links between the assessment and tasks and the activities more clear, basically because I think the assessment still drive[s] a lot of what the students, or is one of their motivations for using the resources, to see how it relates to the assessment tasks. (i4)

By the final interview Harry explained that he did not want students to use the elearning resource merely for conceptualisation of the practical component. He said:

> One of the things we pride ourselves on is having active involvement by the students and… it's probably useful for us to encourage them to think of it as a road map rather than just a stand-alone conceptualisation of [the practical]. (i4)

Observational records of the elearning resource over the course of the research confirm that, while the initial elearning resource promoted student conceptualisation of the practical component and provided images associated with it, in the second implementation the elearning resource focussed on supporting the tasks the students would be expected to perform during the practical component and for assessment, and clearer learning objectives. Thus, Harry's goal in teaching using elearning in his unit of study was transformed over the two years of the research. In addition Harry realised the need to align course content with assessment and learning objectives.

Values: Enthusiasm and passion

As noted above, Harry believed face-to-face teaching was important for learning and teaching, and in the first interview commented on the value of having an "enthusiastic teacher" in this context. However field notes taken over the course of the research reveal a decline in Harry's enthusiasm at the end of each semester as he received feedback from students recommending that the elearning resource have clearer links to assessment rather than conceptualisation of the practical.

An exception to Harry's waning enthusiasm in the final interview occurred during a discussion about online communication tools. Harry experimented with online communication tools in the second implementation of the elearning resource by setting the students a group work activity that they were to partially or fully prepare using the elearning resource's discussion board. Harry was eager to continue using online communication tools to facilitate student interaction, as he commented in the final interview:

> I'm probably keen to try the discussion tool a bit more… You know the sorts of internet forums... where people will chat passionately? (i4)

Harry stated categorically at the beginning of the research that he preferred face-to-face teaching and valued interaction with students. However his interest in elearning increased during the second implementation as he realised he could interact with his students via online communication tools in the elearning resource.

Role of reflection

Harry was grateful for the opportunity to reflect and evaluate the elearning resource through the course of the research, although he acknowledged that the process was not always possible due to time constraints. In the third interview he concluded:

> I've enjoyed the process. It's really fun to chat to you and actually gives you a chance to think about the whole motivation for doing it. So it's probably useful in terms of the evaluation of it, too, because … I think we often wouldn't invest an hour in trying to talk about it or think about it. We often look at it and go, 'Yes that's fine, yes that's fine, let's move on to the next bit.' (i3)

Thus Harry acknowledged the role of reflection in the transformation of his conceptions of, and approach to, elearning and in the development of the elearning resource.

Discussion

By the end of the research, Harry's focus was on integrating assessment tasks with practical materials in redeveloping the elearning resource. These changes came as a result of student feedback about the need for clearer links between content and assessment, which illustrates the students' strategic approach to learning (Entwistle *et al.* 1979). It also supports Biggs' (2003) recommendation to align learning objectives, content and assessment. While Harry had acknowledged his students' strategic approach to learning at the beginning of the research, it was only after two implementations of his elearning resource that he understood the implications of this for an elearning resource. Consequently the driver of development of the elearning resource changed from one of meeting learning outcomes to one of clarifying and meeting students' learning needs. At the same time, Harry refined his lesson image and his conceptions of, and approach to, elearning. The process involved in the transformation of Harry's conceptions of, and approach to, teaching using elearning is depicted in Figure 2.
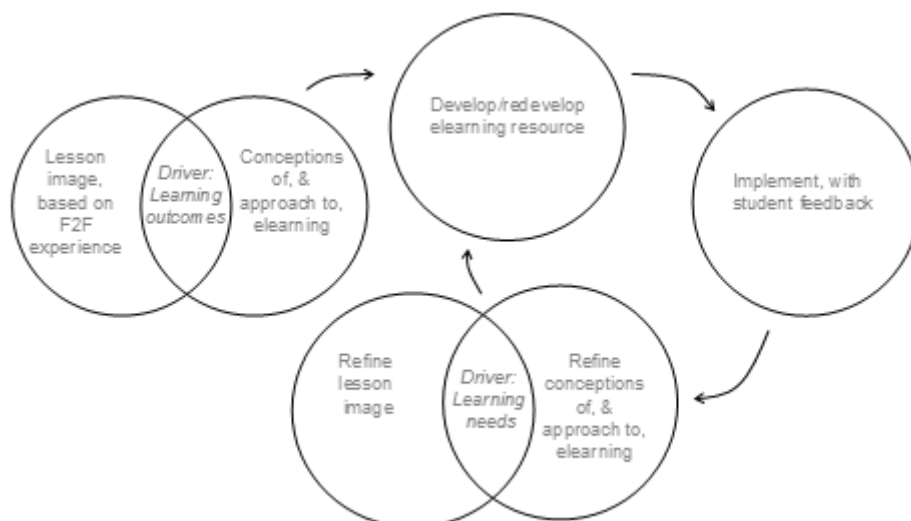
Figure 2: Process involved in transforming conceptions of, and approach to, teaching using elearning

Harry's transformation was particularly evident in his introduction of an online communication tool, with which his students were able to participate in online discussions. Until that time, according to Gonzalez (2009), Harry had displayed a content-focused conception of, and approach to, elearning: his students individually accessed the web to study content provided by the lecturer and learn knowledge owned by the lecturer. However, by the end of the course of the research, Harry had transformed to a more developed conception of, and approach to elearning: for one assessment task his students accessed the web for learning-related communication by participating in online discussions set up by the lecturer. This enabled the students to learn and extend the content provided by the lecturer and discover knowledge within the lecturer's framework.

The fact that Harry's beliefs, goals and values appeared to progress at some stages of the research and backtrack at others confirms research by Postareff *et al.* (2008), who found that teachers may hold dissonant conceptions of, and approaches to, learning and teaching. Most importantly, their research showed that dissonance is common during a teacher's transformation from a teacher/content- to student/learning-centred conception of, and approach to, learning and teaching. The contradictions in teachers' beliefs have been highlighted by Ballantyne *et al.* (1999). They attribute these to "the complexity and situatedness of teaching, which involves making sense of contradictions and dilemmas; wrestling with ideas and methods; interacting with students and colleagues; and juggling the demands of teaching in an increasingly crowded portfolio of professional responsibilities."

An understanding of the way in which Harry's conceptions of, and approach to, elearning transformed over two years throws light onto ways in which universities can support teachers as they move into elearning. Parallels can be made to Calderhead's claim that when teachers learn to teach a new topic area, they need to modify not only their subject matter knowledge, but also their procedural knowledge, and that this requires "more than simply mapping new subject matter knowledge onto existing procedural routines" (1991 p271). Moreover, he claims teachers need to be provided with support to make both types of modifications (1984). Otherwise, Calderhead (1984) cautions, in dealing with the demands and constraints of their work, teachers tend to rely on what is familiar and only superficially modify their teaching.

The importance of reflection for the professional teacher is noted by Shulman (1986), who claims, "The teacher is not only a master of procedure but also of content and rationale, and capable of explaining why something is done. The teacher is capable of reflection leading to self-knowledge" (p13). Similarly Torrisi-Steele and Davis (2000) highlight the importance of reflection for university teachers developing elearning resources. They conclude (p292):

> Total development of the online materials is in most instances an overlay of two
> processes: the process of development and design of the actual materials, and the process
> of reflection and evolution of teaching practice in the face of new possibilities offered by

the technology; with reflection and evolution of teaching practice informing development and design of materials.

These findings support Tearle *et al.* (1999), who claim technology can only be integrated into the curriculum when the teacher reflects on his or her approach to learning and teaching, and adopts appropriate strategies.

Thus, the key recommendation of this research, highlighted in Figure 3, is for higher education institutions to perceive elearning development as an iterative process that often takes place over more than one semester. Consequently elearning development support needs to be provided to academic staff not only at the beginning of that process, but also following successive iterations. This support needs to include ongoing discussions between academic/elearning developers and academic staff that promote reflection on the academic's elearning resource and how it corresponds with their teaching beliefs, values and goals, as well as their lesson image and student learning needs. Academic staff may begin developing an elearning resource with preconceived views about elearning and may only become receptive to alternative conceptions of, and approaches to, elearning after implementing and reflecting on their resource over one or more semesters.

- Perceive development of elearning resources as an iterative process, taking place over more than one semester.
- During this process, academic and elearning developers should:
    - provide ongoing support to academic staff
    - promote reflection with academic staff
    - hold ongoing discussions with academic staff about beliefs, values, goals, lesson image & student learning needs.

Figure 3: Key recommendations

Conclusion

These findings demonstrate that as the participant worked with his elearning resource over two years, he transformed the resource to improve learning and teaching. Through the process he came to understand his students' learning needs and approaches to elearning, and his conceptions of, and approach to, elearning. This research provides insight into the role of reflection and lends itself to further research into how universities can support teachers in their use of elearning.

Acknowledgements

References

Ballantyne, R., Bain, J.D. & Packer, J. (1999) Researching university teaching in Australia: Themes and issues in academics' reflections. Studies in Higher Education, 24(2), 237–257.

Bates, A.W. & Poole, G. (2003) Effective teaching with technology in higher education: Foundations for success. San Francisco: Jossey-Bass.

Biggs, J.B. ([1999] 2003) Teaching for quality learning at university. Philadelphia, Pa: SRHE & Open University Press.

Bowden, J. & Marton, F. ([1998] 2004) The university of learning: Beyond quality and competence 2nd edition London: RoutledgeFalmer.

Burns, R. (2000) Introduction to research methods Sydney: Longman.

Calderhead, J. (1984) Teachers' classroom decision making, London: Hold, Rinehart & Winston.

Calderhead, J. (1991) Representations of teachers' knowledge. In P. Goodyear (Ed) Teaching knowledge and intelligent tutoring, New Jersey: Ablex.

Calderhead, J. (1996) Teachers: Beliefs and knowledge. In D. Berliner & R. Calfee (Eds) Handbook of Educational Psychology, 709-725, New York: Simon & Schuster Macmillan.

Ellis, R.A., Jarkey, N., Mahony, M.J., Peat, M. & Sheely, S. (2007) Managing quality improvement of elearning in a large, campus-based university. Quality Assurance in Education, 15(1), 9–23.

Entwistle, N., Hanley, M. & Hounsell, D. (1979) Identifying distinctive approaches to studying. Higher Education, 8(4), 365-380.

Entwistle, N., Skinner, D. Entwistle, D. & Orr, S. (2000) Conceptions and beliefs about "good teaching": An Integration of Contrasting Research Areas Higher education research & development 19(1), 5-26.

Entwistle, N. & Walker, P. (2002) Strategic alertness and expanded awareness within sophisticated conceptions of teaching. In N. Hativa & P. Goodyear (Eds) Teacher thinking, beliefs and knowledge in higher education, 79-101, Dordrecht: Kluwer Academic Publishers.

Gonzalez, C. (2009) Conceptions of, and approaches to, teaching online: A study of lecturers teaching postgraduate distance courses. Higher Education, Springer: Netherlands http://www.springerlink.com/content/q21u130781713782/?p=a7308aa56f414778b7e9a8ae43795bce&pi=0

Goodyear, P. (2005) Educational design and networked learning: Patterns, pattern languages and design practice. Australian Journal of Educational Technology, 21(1), 82-101.

Ham, V. & Davey, R. (2005) Our first time: Two higher education tutors reflect on becoming a 'virtual teacher'. Innovations in Education and Teaching International, 42(3), 257-264.

Joint Information Systems Committee (JISC) (2007) Student expectations study http://www.jisc.ac.uk/publications/publications/studentexpectations

Kember, D. (2001) Reflective teaching and learning in the health professions: Action research in professional education Oxford: Malden

Kember, D. & Gow, L. (1990) Cultural specificity of approaches to study. British Journal of Educational Psychology, 60, 356-363.

Laurillard, D. (2003) Rethinking university teaching: A framework for the effective use of educational technology 2nd edition London: RoutledgeFalmer.

Leinhardt, G. & Greeno, J. G. (1991) The cognitive skill of teaching. In P. Goodyear (Ed) Teaching knowledge and intelligent tutoring New Jersey: Ablex.

MacAlpine, L., Weston, C., Beachamp, C., Wiseman, C. & Beauchamp, J. (1999) Building a metacognitive model of reflection. Higher Education 37, 105–131.

McShane, K. (2006). Sending Messages to a Machine': Articulating ethe-real selves in blended teaching (and learning). E–Learning, 3(1),88-99.

McShane, K. (2004) Integrating face-to-face and online teaching: Academics' role concept and teaching choices. Teaching in Higher Education, 9(1), 3–16.

Marton, F. & Säljö, R. (1976) On qualitative differences in learning – I: Outcome and process. British Journal of Educational Psychology, 46, 4–11.

Marton, F. & Trigwell, K. (2000) Variato est mater studiorum. Higher Education, 19, 381–395.

Neumannn, W.L. (2003) Social research methods: Qualitative and quantitative research 4th ed. Needham Heights, Massachusetts: Allyn & Bacon.

Postareff, L. Katajavuori, N., Lindblom-Ylänne, S. & Trigwell, K. (2008) Consonance and dissonance in descriptions of teaching of university teachers. Studies in Higher Education, 33(1), 49-61.

Ramsden, P. (2003) Learning to teach in higher education 2nd edition London: RoutledgeFalmer.

Roberts, G. (2003) Teaching using the Web: Conceptions and approaches from a phenomenographic perspective. Instructional Science, 31(1/2), 127-150.

Schoenfeld, A. (1998) Toward a theory of teaching-in-context. Issues in Education, 4(1), 1-94.

Schön, D.A. (1991) The reflective practitioner: How professionals think in action London: Ashgate

Scott, P. ([1998] 2000) Massification, Internationalization and Globalization. In Scott, P. (Ed) The globalization of higher education (pp108–129) Philadelphia: SRHE and Open University Press.

Shulman, L.S. (1986) Those who understand: Knowledge growth in teaching. Educational researcher, 15(2), 4–14.

Steel, C. (2009) Reconciling university teacher beliefs to create learning designs for LMS environments. Australian journal of educational technology, 25(3), 399-420.

Steel, C. (2006) Influence of teacher beliefs on web-enhanced learning experiences: Learners and teachers. In Who's learning? Whose technology? Proceedings of the 23rd annual ASCILITE conference, ed. L. Markhauskaite, P. Goodyear and P. Reimann, 795-804. Sydney, NSW: University of Sydney.pp795-804.

Tearle, P., Dillon, P. & Davis, N. (1999) Use of information technology by English university teachers: Developments and trends at the time of the national inquiry into higher education. Journal of Further and Higher Education, 23(1), 5–15.

Torrissi-Steele, G. & Davis, G. (2000) "A website for my subject": The experiences of some academics' engagement with educational designers in a team based approach to developing online learning materials. Australian Journal of Educational Technology 16(3), 283-301.

Trigwell, K. & Prosser, M. (1997) Towards an understanding of individual acts of teaching and learning. Higher Education Research and Development, 16(2).

Trigwell, K. Prosser, M. & Waterhouse, F. (1999) Relations between teachers' approaches to teaching and students' approaches to learning. Higher Education, 37, 57-70.

Yin, R.K. (2003) Case study research: Design and methods 3rd edition Thousand Oaks, California: Sage.

Yinger, R. & Hendricks-Lee, M. (1993) Working knowledge in teaching. In J. Calderhead & P. Denicolo (Eds) Research on teacher thinking: Understanding professional development, 100–123, London: The Falmer Press.

Author contact details:
Karen M. Scott
Discipline of Paediatrics & Child Health
Sydney Medical School
The University of Sydney.
Email: karens12@chw.edu.au

Please cite as: Scott, K.M. (2010). A longitudinal study into the transformation of a university teacher's conceptions of, and approach to, elearning. In C.H. Steel, M.J. Keppell, P. Gerbic & S. Housego (Eds.), *Curriculum, technology & transformation for an unknown future. Proceedings ascilite Sydney 2010* (pp.876-887). http://ascilite.org.au/conferences/sydney10/procs/Scott-full.pdf