

Reflective engagement as professional development in the lives of university teachers

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This paper takes up two important issues in the professional development of university teachers: the controversy surrounding reflective inquiry and its purported benefits for professional development and the lack of research on what teachers learn from reflective inquiry and how that affects and/or changes their professional practice.¹ Specifically, the article asks what is reflective engagement and to what uses do university faculty put reflective engagement over time? Drawing on data from a study of 20 faculty members of the National University of Ireland at University College Cork (UCC) who created a teaching portfolio to compete for an award for excellence in teaching, I first demonstrate empirically how a greater conscious awareness of the act of teaching is facilitated by the creation of a reflective teaching portfolio. Then, through brief case studies, I examine specific uses three UCC teachers made of insights from their portfolio reflections and how they redirected their practice because of what they discovered. Patterns of redirection suggest that professional development through reflective engagement results from a subtle interaction of personal, professional and institutional elements. I offer a refined definition of reflective engagement and its processes to contribute to current discussions about a needed, shared understanding of it to carry out research and I present a small set of vignettes to suggest potential hypotheses for future investigations of its effects and meaning in the professional lives of university teachers.

Keywords: Reflective engagement; University faculty; Reflective portfolio inquiry process; Professional development

Introduction: what is reflective engagement?

Current discussions of reflection and reflective inquiry have focused on the troubling divide between the claims of benefits of reflective engagement for teachers' professional practice and development and the lack of systematic research to verify these claims, given the absence of an agreed-upon definition of reflection (Lyons, 1998,

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2002a; Ghaye, 2000; Zeichner & Wray, 2001; Rodgers, 2002; see also Mezirow, 1978; Mishler, 1990; Copeland *et al.*, 1993). Recently, in a compelling, award winning review, Carol Rodgers (2002) revisited and analyzed John Dewey's (1998) frequently cited but little explicated path-breaking work on reflective inquiry. Her goal was to create a shared view of what reflection entails. Rodgers argued that without a shared definition of reflection, four problems emerge:

It is unclear how systematic reflection is different from other types of thought; it is difficult to assess a skill that is vaguely defined; without a clear picture of what reflection looks like, it has lost its ability to be seen and therefore has begun to lose its value. And finally, it is difficult to research the effects of reflective teacher education and professional development on teachers' practice and students' learning. (Rodgers, 2002, p. 842)

Rodgers' purpose is to facilitate systematic studies of reflective thinking. I applaud this effort and in a parallel project I have been reviewing Dewey's work on reflective thinking and inquiry to incorporate a more explicit understanding of it into my own work (Lyons *et al.*, 2002), i.e. to facilitate university faculty in the construction of a reflective teaching portfolio. One purpose is to advance Boyer's (1990) idea of a needed scholarship of teaching at university level. I would argue that, in addition to a shared definition of reflection, there is needed at the university level a shared understanding of both the processes for teaching/or scaffolding reflective inquiry, such as a reflective portfolio process, and of the uses to which faculty put reflective engagement in their professional lives (Stanley, 2004; see also Wilson & Berne, 1999). In this article I take up these issues to do three things.

- To outline reflective inquiry in Dewey's terms, using reflective thinking and inquiry interchangeably as Dewey does, and to show why it became the rationale for advancing a new scholarship of teaching at University College Cork (UCC). While I acknowledge that most researchers see Dewey and Donald Schön (1983) as the chief theorists of reflective practice, my goal is to revisit Dewey's work.²
- To describe briefly the scaffolding process involved in inquiring into and creating a reflective teaching portfolio. I use the term reflective engagement to characterize this inquiry process. Here results from a study of portfolio inquiry by 20 UCC faculty members (Lyons, 2002c) are presented.
- To use these findings as a basis for examining the meaning of reflective engagement for three UCC faculty portfolio makers and the explicit uses to which they put reflection in their professional work. While each person acts to redirect his/her practice, the specific contours of the three endeavours reveal subtle differences in pathways, purposes and timing that shape these redirections, suggesting that the uses of reflective engagement involve a more complex interaction of the personal, professional and institutional contexts of practice. A new research agenda is called for and several potential hypotheses are offered for careful examination of the trajectories and uses of reflective engagement by university faculty over time.

I turn first to Dewey's description of reflective inquiry and its processes and consider the outcomes of it suggested by Dewey. Later I will compare these with

actual outcomes UCC faculty identified for themselves and what they said they learned in this process that influenced their professional practice.

John Dewey's reflective inquiry: what potential outcomes?

When John Dewey published his book *How We Think* he emphasized it was 'a restatement of the relation of reflective thinking to the educative process'. In laying out his definitions Dewey first identified what reflective thinking is not. For Dewey reflective thinking was not 'what is just mulling things over'. Nor is it 'a stream of consciousness' or 'mental pictures of something not present' or synonymous with statements such as 'I believe'. For Dewey, reflective thinking 'has a purpose beyond the entertainment of a train of agreeable mental inventions or pictures. The train must lead somewhere. It must tend to a conclusion that can be sustained outside the course of images'. And:

There is nothing in the mere fact of thought as identified with belief that reveals whether the belief is well-founded or not—such are prejudgments, not conclusions reached as a result of mental activity such as observing, collecting, and examining evidence. (Dewey, 1998, pp. 5–7)

For Dewey, then, reflective thinking impels serious, systematic inquiry, implies belief in evidence and demands an 'active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends'. Although any one of the first three kinds of thought may elicit this type, 'once begun, it includes a conscious and voluntary effort to establish belief upon a firm basis as evidence of rationality'. Dewey saw reflective thinking as involving two critical phases: '(1) a state of doubt, hesitation, perplexity, mental difficulty, in which thinking originates, and (2) an act of searching, hunting, inquiring, to find material that will resolve the doubt, settle, and dispose of the perplexity'. Dewey emphasized that 'One can think reflectively only when one is willing to endure suspense' and he maintained that certain attitudes are necessary: open-mindedness, wholeheartedness and responsibility, i.e. being willing to consider the implications of one's learning (of what one knows) for one's actions. When Dewey argued for reflective thinking he identified its values: 'It makes possible action with a conscious aim; makes possible systemic preparations and inventions; and enriches things with meanings'. Such thinking:

enables us to direct our activities with foresight and to plan according to ends or purposes of which we are aware. It enables us to act in deliberate and intentional fashion to attain future objects ... to command what is now distant and lacking. By putting the consequences of different ways and lines of action before the mind, it enables us to know what we are about when we act. (Dewey, 1998, pp. 17–19)

Dewey thus suggests what is necessary to engage in reflective inquiry as well as what its potential outcomes might look like. His emphases on active inquiry, searching and evidence imply a need for a scaffold to sustain engagement in reflective inquiry over time. Dewey further identified at least five potential outcomes of sustained inquiry:

(1) action with conscious aims; (2) systematic preparations and inventions; (3) acting in deliberate and intentional fashion; (4) knowing what we are about when we act; (5) the construction of meanings.

But what do university teachers report and actually say they find in the reflective process today? What outcomes do they identify? The experience of reflective engagement by UCC faculty reveals the meanings they find in it, what it is they become conscious of and what they say they discover and come to know through the process. To better demonstrate these findings I first describe the larger context in which the project occurred.

The portfolio process as a scaffold for reflective inquiry? The University College Cork (UCC) Project

In the spring of 2001 UCC launched a challenge to its faculty that unexpectedly created a new conversation about teaching and student learning within the university. The project began with an invitation to the faculty from the President of UCC, Gerald Wrixon, to apply for an award for 'Excellence in Teaching at UCC'. Faculty were to document and present evidence of their teaching through a portfolio process. Because of my research and experience in the portfolio process (Lyons, 1998) Vice-president Aine Hyland, the chief anchor of the new programme, invited me to introduce the portfolio process as a Visiting Research Scholar at UCC. I agreed and in May 2001 I sketched out three seminars, each with a broad purpose: to introduce the portfolio process as a mode of inquiry into teaching and learning and as a means to document it; to identify portfolio entries as consisting of evidence, artifacts and reflections on teaching; to review how portfolio evidence could be assessed. The conceptual framework for the project, the idea of advancing a scholarship of teaching at the university level, was drawn from an idea then gaining currency, i.e. a new way to capture and convey the knowledge of teaching was needed in the academy. Although the rationale for this work has a surprisingly long history, the year 1990 is an important starting point, if not a transformational moment, one that came to provide a context for the UCC project.

For in 1990 Ernest Boyer, of the Carnegie Foundation, published his challenging book *Scholarship reconsidered: priorities of the professoriate* (Boyer, 1990). Calling for a radical reconsideration of scholarship within the academy, Boyer argued that colleges and universities needed new forms of scholarship beyond the traditional research model, what he termed the scholarship of discovery. He called for three additional forms: a scholarship of integration that would make investigations across disciplines to capture and interpret work at their intersections; a scholarship of application that would address real, consequential problems of people and institutions; a scholarship of teaching that would not only contribute to knowledge but transform and extend it.

Boyer's work launched a series of investigations into college teaching (Hutchings, 1998a; Stanley, 2004) and raised such questions as what is the scholarship of teaching and how can it be documented, represented? But it was Donald Schön who saw that if Boyer's idea about teaching was to be taken seriously it must 'produce knowledge

that is testably valid, and [such] claims ... must lend themselves to intellectual debate within academic communities of inquiry' (Schön, 1995, p. 27). Schön saw too that the new scholarship of teaching implied a kind of action research, planned and conducted by faculty members themselves, not by the outside observer of standard scientific inquiry. But would practitioner research really count as does traditional research?

Some 60 years earlier the philosopher John Dewey made a strikingly similar argument. In his *Sources of a science of education* (Dewey, 1929) he called for a conception of educational scholarship that differed from the scientific hypothesis testing model then emerging in American institutions of higher learning. Dewey was concerned that education research was developing at too great a remove from practice. He insisted:

that the problems which require scientific treatment [in teaching] arise in actual relationships with students ... [thus], it is impossible to see how there can be an adequate subject matter [to investigate], unless there is active participation on the part of those directly engaged in teaching. (Dewey, 1929, p. 25)

Seventy years later Boyer and Schön echoed these concerns of Dewey. As bookends for a century of education research, however, their words serve as a cautionary tale, underscoring the long-standing antipathy to teachers engaged in interrogating their own teaching practices (Grant & Murray, 1999; Lagemann, 2000; Cochran-Smith, 2005).

While Boyer's new scholarship of teaching implied Dewey's imperative of action research planned and conducted by faculty themselves, Lee Shulman, president of the Carnegie Foundation for the Advancement of Teaching, extended these arguments. He saw that it would be necessary to remove teaching from its classic isolation in a classroom, to make it public, and that would call for a new kind of documentation:

My argument is that until we find ways of publicly displaying, examining, archiving, and referencing teaching as a form of scholarship and investigation, our pedagogical knowledge and know-how will never serve us as scholars in the ways our research does. The archival functions of research scaffold our frailties of memory, and we need something comparable for the scholarship of teaching. (Shulman, 1998a, p. 7)

It was from Shulman's work, joined with that of colleagues at the American Association for Higher Education (AAHE), that the portfolio emerged as a candidate for representing teaching for a new scholarship. But over time the portfolio became something more.

The portfolio in historical perspective

Portfolios have a long and valued tradition with many professionals, such as writers, artists, photographers and architects. However, portfolio use in teaching and teacher education are only a recent phenomenon. In the 1980s portfolios emerged as a more appropriate medium to capture teaching's complex dynamics or dimensions. Life in classrooms, teachers at work could be caught through a portfolio,

with its entries and evidence of student and teacher work and assessments over time. But portfolio making is far from a casual act. As Shulman argued, ‘Your theory of teaching will determine a reasonable portfolio entry. What is worth documenting, worth reflecting on, what is deemed portfolio worthy is a theoretical act’ (Shulman, 1998b, pp. 24–25).

Recent history highlights the subtle shift from the portfolio as a mode of representation and documentation for the assessment of teaching to the portfolio as a deliberate method for reflective inquiry into teaching. Ernest Boyer helped to precipitate this development. When he challenged the academy to advance a scholarship of teaching he mobilized discussion about how teaching could be considered a form of scholarship.

For an activity to be designated as scholarship, the AAHE suggests three characteristics: it should be public; it should be susceptible to critical review and evaluation; it should be accessible for exchange and use by other members of one’s community (Shulman, 1998a, p. 5). To the AAHE two portfolio models offer the possibility of meeting these goals: the Teaching Portfolio, focused on a sampling of all one’s teaching activities, and the Course Portfolio, focused on a single course. Both portfolio models involve acts of inquiries into one’s practice (Shulman, 1998a; Hutchings, 1998b).

Typically, a completed portfolio begins with an introduction, a statement of one’s teaching philosophy, and is followed by a set of entries and evidence. These incorporate the design (such as a course syllabus), the enactment (such as the activities students are asked to perform and do) and the results of teaching (such as student work, examinations, projects and/or portfolios). Each portfolio entry is labelled with a title, accompanied by a rationale for its inclusion and a reflection. It concludes with a final reflection on the portfolio as a whole and often suggests further actions.

The centrality of reflection

Importantly, in this portfolio process each portfolio entry carries a crucial element, i.e. a reflection. Here reflection is defined as an intentional act of mind, engaging a person alone or in collaboration with others in interrogating one’s teaching, especially a compelling or puzzling situation of teaching or learning to construct some understanding of it (Lyons, 2002a, p. 99). Through reflection a teacher revisits and inquires into his/her own teaching, assessing what succeeded or failed and why. In this process teachers uncover the meanings and interpretations they make of their own practice, their refinements or creation of theories, their understandings of what students know and understand and how they as teachers need to change or try out new ways of teaching (Schön, 1983; LaBoskey, 1994; Bruner, 1996; Dewey, 1998). This reflective interrogation of the portfolio process, i.e. reflective engagement, then looks both ways, to past experience and forward to future ones.

However, portfolio making is not a simple undertaking. It needs to be scaffolded and portfolio makers need to be supported in their development. In the UCC project one scaffold was provided by a weekly Portfolio Seminar originated in 2001–2002.

These were continued into the autumn of the 2002 academic year. Each seminar centred on presentations by faculty, who discussed and shared samples of their own potential portfolio entries and reflections. In that first year some 250 faculty members attended seminars: 45, out of some 700 faculty members, presented portfolio entries for their own teaching or course portfolio and 23 completed a teaching portfolio to compete for the five UCC Awards for Teaching Excellence. The seminars continued into 2004–2005, along with other faculty development course offerings on such topics as teaching for understanding, multiple intelligences and an introduction to Blackboard, an interactive teaching programme. Many UCC portfolio makers of 2002 agreed to publish sample entries in their portfolios to make them available to other faculty members (Lyons *et al.*, 2002; see also Hyland, 2004). In the autumn of 2004 the seminars and programmes were incorporated into a new Post-graduate Certificate Programme in Teaching and Learning. Some 65 UCC faculty members elected to take the new, year-long programme.

Results: refuting or supporting prior claims?

Most portfolio makers claim reflection is the core of the process bringing a new knowledge of practice to consciousness. While this claim is widely reported by teachers and teacher educators, the UCC study of 20 portfolio makers presented an opportunity to confirm or refute it empirically. In 2002 the UCC group of 23 faculty members, who shared both a common definition of reflective inquiry and an introduction to portfolio making, voluntarily created and presented a reflective teaching portfolio for the teaching award. Twenty of these were interviewed in 2002–2003 for the research study presented here.

The findings of the UCC research were surprisingly consistent, both with prior claims of teachers and with Dewey's own predictions of its outcomes (Lyons, 2002c). In an analysis of the study's interview data, especially in response to the questions looking back over the portfolio process, what stands out for you and what would you say you learned from the process, findings revealed that 19 out of 20 UCC staff members cited that reflective engagement through the portfolio process created a new 'consciousness' of their own teaching practice. For most faculty, 17 out of 20, this conscious awareness triggered a set of four related actions: (1) this new consciousness led them to articulate a greater explicitness about their teaching goals and practices, both for themselves and their students; (2) they then began to ask what exactly do students learn and know from my teaching?; (3) they identified changes they would consider in their teaching practice; (4) they then said they actually changed their practice. Dewey had suggested these as potential outcomes of reflective thinking, but a more explicit view of how that happens was articulated by the faculty members themselves.

But new questions now emerged. What does it mean to have a new consciousness about your teaching and/or student learning? How do teachers actually respond to this new awareness of their professional practice? What do they do? What do they say they learn? Although Boyer's work had challenged a new birth of valuing teaching in

higher education and argued that the tired, old teaching versus research controversy needed to desist, in the early 2000s most faculty were still being socialized to give primacy to their research (Wilson & Berne, 1999; Stanley, 2004). Mary Huber, who has been documenting the progress of the Scholarship of Teaching developments in the USA and England, commented:

Unlike the rich discourse most scholars enjoy in their own field, talk about teaching has been impoverished ... most faculty members have no training as teachers ... teaching has not counted for much in the reward system, especially on the research university campuses ... and finally, teaching has been most difficult to evaluate, in part because it is so hard to 'make public'. (Huber, 2002, pp. 27–28)

Thus, we want to ask how three UCC teachers found their responses to the reflective process and what understandings of their teaching emerged from this process. Does the process advance a scholarship of teaching professionalism?

Three teachers: emerging vignettes of the uses of reflective engagement

Three teachers provide a set of brief case studies, a sampler of vignettes of how faculty members in UCC encountered and responded to their experience with reflective engagement. Each of the three teachers created a teaching portfolio and all took part in the seminars introducing the reflective portfolio process in which they, as well as other faculty members, presented a potential portfolio entry. Here I focus on the experiences of each to uncover what these faculty members say they discovered from their participation in reflective engagement and how this knowledge influenced their teaching practice. Differences in the responses are highlighted. Data are from their portfolio entries, their portfolio presentations and/or from interviews I conducted with them (Lyons, 2002b).

Vignette 1. The finance professor: discovering the connectedness of one's teaching

The Professor of Accounting, Finance and Information Systems is a veteran of some 20 years of teaching at UCC of both introductory and advanced courses in accounting. In 2003 he stood out as the author of two teaching portfolios, completed within a year of each other. Both were submitted for the university's award for Excellence in Teaching. After he completed the second portfolio, which received a prized award, he was asked in an interview how he came to do the two. Responding, he revealed the story of an ongoing journey of his own professional development that began in the autumn of the 2001–2002 academic year (Lyons, 2002b). It turned out to be an encounter with his understanding of his own teaching and of what it means to become conscious of your teaching practice.

The accounting professor recalled how it began. As he was readying for the 'imminent fray' of the 2001 academic year, 'an email flashed details of a new UCC course for faculty, Multiple Approaches to Teaching and Learning'. The finance professor revealed:

I asked myself what could I learn that 20 years of teaching experience hadn't taught me already? Still, the course has a certain curiosity value. Why not go along and find out. It might turn out to be a waste of time, but so what?

How wrong I was. Gradually my resistance began to thaw with what was presented: Perkins' Dimensions of Understanding, Gardner's theory of multiple intelligences, student centred learning, active learning in the lecture theatre, teaching for understanding.

During the days that followed, the accounting professor acknowledged he experienced what he called a:

Damascene realization. It is the taught that count. Because teaching must surely be about student-centred learning. Active learning where the students take centre stage ... because in doing, one is learning, testing and reinforcing simultaneously. ... Thus, steeped in my newfound wisdom, I looked again at term one Academic Year, 2001–2002. I decided to keep a teaching diary.

His first teaching portfolio incorporated this diary to document how he implemented a new teaching philosophy, reaffirming his commitment to implement active, student-centred learning.

That a veteran teacher who has always loved teaching uncovered a body of knowledge about teaching and student-centred learning only 20 years after he entered teaching at university level may seem remarkable, however, it is not unusual. It is reported informally by many people at UCC. Others at many institutions similarly recall coming to teach at university having no instruction in teaching and not knowing that research on teaching and learning exists. Huber (2002) noted that 'Our colleagues may care deeply about their courses, their students, and their department's curriculum, but they do not usually see their own teaching and learning as a matter for scholarly inquiry and communication' (p. 25). For many their teaching began when they were simply handed a syllabus and told to teach it (Huber, 1998; Stanley, 2004).

However, the accounting professor's discovery of the knowledge of teaching coincided with his discovery of the teaching portfolio process. As he said in an interview, 'When I did the portfolio the first time, I was teaching as I was learning what the portfolio was and I wasn't able to plan my teaching because I only found out later what I wanted to achieve'. But what difference did this make to him? In part that led him to create a new portfolio, the second one. When asked what he learned from doing the second portfolio, he stated:

I've learned how to go about researching teaching. I found that when I began to do the [first] portfolio it was a description of my emotional thoughts about teaching. It was not a series of discoveries. ... So I suppose it changed the way I think about things. I saw teaching as a much deeper thing. And I found that I was able to combine my interest in my own discipline with my teaching on an intellectual and research-based way

I suppose I began to see that there was more in it [teaching] than just performance. I suppose I always regarded teaching as you prepare really well and you communicate really well, but I began to see it as part of a much broader base, where you have theories of teaching. So what I was doing off the cuff, I began to see there was a whole web of knowledge there which I said, OK, maybe I can participate in this web of knowledge.

I also saw that [with my first portfolio] it was somewhat unconnected. I should have had a connected portfolio and not discrete elements. I needed to create that bond. I don't think I looked at each component as connected. Like I looked at the design, enactment and results [the elements of a portfolio] each in a separate way. I didn't see the linkages between the parts. I knew I should have a model rather than discrete elements. So the purpose [of the second portfolio] was really to create a model.

So what I did then, I said OK, if you are going to have a model you have to start with the roots of your teaching, which is: what are your core objectives that you are hoping to achieve? Because what you are hoping to achieve is closely linked to what is your teaching philosophy. One's philosophy must be consistent with one's objectives. One's teaching design is applying your philosophy. Just as enactment should be applying one's design of teaching, it all should derive from one's objectives and be linked to one's philosophy. So it is that model that I tried to apply. So I looked at all this in a more integrated way than when I did the first portfolio.

Interestingly, when asked how he started to think about needing a model the accounting professor made a new connection.

I needed a model because I was not happy with the discrete pieces, the way I had approached my first portfolio. It was my way of seeing that I had created something that needed to be improved upon. I needed a framework and the framework for me was the model. ... There, a certain element of your discipline enters in. When you are teaching and working with graduate students you are trying to get them to think of a framework, a structure. I suppose a lot of it would come from the idea of the structure of the discipline—and that is a design issue. One other thing. Accounting is a new discipline. We have struggled in accounting to develop a conceptual framework. And I suppose I imported that struggle into my teaching model. I suppose I am looking at my teaching model as akin to developing a conceptual model in my discipline.

Observations. What is interesting here is how the development of two portfolios over the period of two years served the accounting professor as a prolonged reflection. The first portfolio was created when he made a crucial discovery: how a body of knowledge about theories of teaching and learning could give him new insights into and change his practice. Then, the second portfolio made possible a new integration of this knowledge and precipitated a more rigorous inquiry, a scrutiny of his practice, identifying and naming how it all fitted together, allowing the implementation of changes that his new understandings made imperative. But the critical element, the beginning for this teacher, was his discovery of a knowledge of teaching and learning. For, as Shulman suggested, any portfolio entry is the concrete embodiment of your teaching philosophy, the demonstration of it. If that is lacking, as the professor discovered, it will be revealed in the entries of the portfolio as well.

Vignette 2. The biochemistry professor: using reflection to make visible the needs of students to shape and reshape a course of study

The Professor of Biochemistry is a soft-spoken but exuberant teacher, who has over 15 years' experience working in biochemistry, teaching advanced and middle level

courses. He stood out in the autumn of 2004 when he too acknowledged in an interview that he was going to prepare a second teaching portfolio (Lyons, 2002b). However, he quickly interjected, 'Not a new one, a re-vamping of the first'. When asked why he decided to do this the biochemistry professor immediately went back to his origins with the senior level course, Advanced Protein Structure, and the year 1993, when he was first asked to teach it. Unhappy at the prospect because the subject matter was slightly outside his immediate area of research, the professor began recounting the iterative process involved in developing a course that now has gone on over 10 years. He also documented a remarkable discovery, his evolving understanding of the needs of his students through the reflective process. He began his story with the first critical additions he made to the course in 1994. Updating his own knowledge with a sabbatical year of study of protein crystals and the protein folding research mentored by the student of a Noble Prize winner, he returned to the university and began to update the course methods that, when he began, were state of the art for the 1950s and 1960s. He introduced crystallization and, later, computer-assisted programmes.

I introduced a lot of online resources and I focus a lot on the protein folding problem, which is a big research problem. So I use that as a kind of paradigm. So what we are trying to do in this course really is: how do we find out about protein structures, and what insights does that give us into the protein-fold-up problem? Because what has become clear in recent years is that this is a kind of cross-over point in a lot of different disciplines, and diseases. If you think of BSE (mad cow disease), of Alzheimer's disease, Parkinson's and a whole lot of other diseases, in which protein misfolding is indicated, it is not known for sure if this is a cause of the disease or a by-product of it. So that is a unifying theme ... that gives a kind of intellectual framework (to the course). Then in terms of the practicality, by the time I did my last portfolio, I had got my course on Power Point and established a Blackboard site ... that is pretty much as far as I had gotten.

But another thing I had done, initially a voluntary but later a mandatory project, gets [students] into a Computer Aided Learning exercise. I give the student a small bit of an amino acid sequence and ask the student to go to the amino acid database and to find out what the protein is. So I make it into a kind of detective story. 'Imagine you get this bit of the sequence and you don't know what the sequence is from. How would you find out what it is from?' This gets them into protein databases and because they all have a different sequence, they all have a different task. I get them to identify the protein and then go into a three-dimensional database and they download the atomic coordinates and they can view it with a graphic system. I introduce them to all of these in a tutorial session. And basically all of these databases are freely available. You can download them to a floppy disk. So I even give them the floppy disk so that they can download this and take it home with them.

The biochemistry professor then emphasized how 'one of the main reasons why I am updating my portfolio is to show and update the course'. He acknowledged that he is interested in a couple of new things. 'One is the animation. So last year was one of the first years that I asked them to do an animation of their protein. Here I can show you' (goes to a computer and shows a student-created animation).

So what I am trying to do is to engage their visual senses and their interest in learning about computer resources to come at the problem from a different perspective. Rather than me giving them info in a lecture.

And I have discovered that in the last few years people have discovered from looking at protein sequences and DNA sequences that there is quite a bit of periodicity in them. Remember when we saw the helix in the protein. Well they have discovered that that periodicity obeys very similar rules to music. What you literally can do now is you can put in a protein sequence and put it to music. And what I am doing now is exploring with a lecturer here at UCC in music, actually exploring possibly putting something together. So I could say, I want you to do an animation and put it to music! You can imagine! and it is actually lovely music And [researchers] are actually beginning to wonder can you almost predict from music aspects of the structure? So I am hoping to put into place and have students actually create some piece of music.

And where we are with it right now is that I am beginning to realize that we are very close to best practice in the field ... And I realize that with the music, we would be out there in terms of best practice. And I would like to create a web-based portfolio. What I had the last time was a teaching portfolio and what I will have this time is a course portfolio. And that would be exciting.

When asked what he would say he learned from putting the portfolio together he replied:

Well you learn a lot about yourself. And that is where the reflection comes in. Because we do not have a lot of time for reflection. You are developing that, the art of teaching not only from the people you are teaching but it forms you as well. And I am not sure people are aware of that. I think you become very aware of it when you are doing a portfolio whereas if you are just going along I do not think you are as aware. I know before I was focused on my teaching, not on students and what they needed. I became clearer about what students' needs were and I developed the course to do that. And now I just think [over time] it kind of revealed to me that I was inching towards a Decca course, basically. That each iteration that I went through added value, it added academic value. The course became better integrated into other aspects of their courses. It became more academically rigorous. So they, the students, were getting a lot of benefits.

But what I wasn't so aware of was the benefits for me, that doing all of this had actually changed me, how I look at this course and other courses. That actually how doing this course had changed me; how I did things, as well. I teach another course on enzymes and it is a different area. Now I would tend to use a lot of computer programs to determine the kinetic properties of enzymes, whereas in the past I would not.

When asked 'You said that if you had not been doing this reflection, you would not know how much you would have benefited, understood these ideas, can you say why?' he went on:

No. For some reason, and I don't know why, it is one of those things I was musing about. It reminds me of Shakespeare in *Love*. You don't know how it works, it's one of those things, it is like magic. I think it is kind of the same thing. Even if one tries for one's best in teaching, one turns up and tries to do one's best. There is a difference between doing that in a non-reflective situation and in the reflection situation. I feel that the way I think about it, the act of putting together the portfolio sort of crystallizes that reflection, becomes the catalyst for that reflection, enables that reflection. In an ideal world we would reflect every day but in the world of science we do not, especially in science, and our kind of output is that we are constantly writing these short research papers, there is so little time.

Now I am very excited about the music bit, to add that to the course, and it will be interesting to see how far you can go in this interdisciplinary bit. ... I feel there is a lot of beauty

there in the natural world. Like even in ordinary things. They can touch people. It is worthwhile.

Observations. The biochemistry professor revealed the power of the reflective process to bring to consciousness the teacher's own understanding and vision of what a course can be for students, as well as for himself. A reflective process became his way of deepening that understanding over time, engaging in a process of assessment. In this case, however, revisiting the development of a course, again over long stretches of time, seems essential to the teacher's own professional understanding.

Vignette 3. The finance professor: fostering the reflective learning of students

The redesigned course, a Placement Module in the three-year Bachelor of Science in Finance Programme, gives students a June to December or January to June placement in a financial firm. The finance professor, a fairly new teacher, who redesigned the programme said she had one important goal for the programme: that it should centre on reflective engagement by students. Discussing her purpose in a portfolio seminar she stated why she put 'a reflective lens' at the centre and revealed how her own reflections on the course served as her spur to change.

My initial reflection on the B.Sc. Finance programme of study was that it was good but not as good as it could be. The learning opportunities were plentiful but not exhaustive. ... I was not convinced that we were equipping our students for careers rather than arming them simply to fight exam battles. The problem I set myself was to design and implement a system of protocols for expanding learning opportunities and optimizing students' scope for deep learning in the context of experiential learning. My question was whether I could engage actively in the process and help 'make teaching relevant' by supplementing prior 'received knowledge' with 'constructed knowledge' such as Belenky *et al.* (1986) suggest, that construction to come via the process of reflective thinking. Critical to my philosophy and approach was the hope that reflective learning coupled with problem-based and critical-thinking-based learning could result in fuller, more enduring performances of understanding and deeper learning.

While the finance professor knew the course was novel in the context of undergraduate degree programmes generally, she believed that critical reflection could become a feature of student learning, appropriately scaffolded and supported within a system of academic mentoring.

[I believe] that we frequently underestimate the capacity of our learners to take ownership of and engage actively in their own learning, and that with sufficient guidance the full benefits of the approach could be realized in time. In consequence, my overarching learning objective for the course module was that students would practice active reflection on both prior theoretical knowledge and on the experiential learning they would achieve in the work environment. ... Reflective learning fosters in students a capacity for critical thinking and facilitates continuation of learning. The corollary of this is that there can be no real development, no deep learning, if experience is not accompanied by a process of inquiry into that experience. In light of that ... I encourage and facilitate learners in the process of conducting a dialogue with themselves, through the medium of compiling the

weekly learning log. ... By asking 'how do the things I'm doing connect? learners themselves become active participants in learning.

In addition, the finance professor had other goals. 'Essentially [the module] allows all learners to confront the dichotomy of theory and application in a work environment that is nevertheless embedded in an academic programme.' It also allowed the professor a source of student and employer perceptions and feedback. The module required all students to compile and submit weekly learning logs which not only provided descriptions of work undertaken but encouraged inquiries into all aspects of that work.

Observations. While the results surpassed the professor's expectations, 'not all students fully engaged in the process of self-inquiry and some required more support than others'. She determined that more ways were needed to actually monitor and be in connection with students. In addition, the professor began to see a bigger picture, that there is a need 'to facilitate a continuation of reflective learning within the larger finance programme offered'. Thus the programme itself comes under scrutiny.

This was the conclusion of the first phase of the professor's inquiry into 'cohesions and connections' in her teaching. She knew there had been only one cycle of the new module, yet in time there would be a greater body of evidence. 'In time there will be a greater scope for a development of my thinking and teaching practice. My early beliefs were that facilitating the problem-based learning of the workplace, scaffolded by academic mentoring, could immeasurably enhance deep learning for students. I was equally convinced that if I could guide learners in a process of interrogating these new understandings, they could come to even deeper, more enduring learning.' Now she has her first body of evidence.

The cases in retrospect: the uses of reflective inquiry—what is learned?

The experiences of the three teachers presented in the case studies reveal the paths each traversed as a result of their reflective inquiries. The paths, while directed to changing their teaching practices, diverge and point to different emphases in purposes, design and what actually changed in their practice. For example, each journey may be characterized.

- **Reconceptualizing one's teaching.** The accounting professor may be said to be engaged in completely reconceptualizing his teaching. Having discovered through the experience of creating his first teaching portfolio that there was no connection between his teaching philosophy, goals and actual practices, he sought to realign them. Influenced by his introduction to a body of knowledge of teaching and learning he had not encountered before, he tried out new teaching strategies that led to reconsidering how the whole fitted together. The radical idea that students must actively construct their own knowledge introduces a new epistemology and view of teaching.

- Assessing the value of a course to its students. The biochemistry professor used the portfolio process to assess the development of a crucial course for fourth year students, asking: what is the value to students of the additions he has made to date and what ones should be added in the future? He found the reflective process of portfolio making provided him with one way he could interrupt his teaching and attend to this assessment. For him, reflection played a necessary if at times mysterious role.
- Testing a hypothesis: that students can be coached to be reflective thinkers themselves. The finance professor redesigned a course for fourth year students as she tested the idea that students themselves could become reflective practitioners in their own right, more aware of their own role in being constructors of knowledge as they explore possible careers. Issues of these epistemological goals demand that she monitor the experiment, using her own mentoring as a scaffold for students to engage in reflective inquiry. She identified how new ways to mentor her students would need attention the next time the course was taught.

There are several points that can be made from these brief vignettes of reflective engagement. It is clear that several factors interact in the activities of the three teachers. First, their own personal histories of teaching and learning influence their starting place, what they believe teaching to be. Then, the university itself provides a significant, new institutional context for validating discussions of teaching and learning: providing seminars and courses on teaching and learning and offering new models of how students know and learn and instantiating an alternative epistemology, i.e. that there is not just one right answer but several. In addition, ongoing seminars provide a scaffold for inquiry into one's teaching, a critical support for bringing to consciousness new insights into ones teaching and student learning. These seminars construct a new community forum for making public knowledge about teaching and learning. These elements may be said to interact and shape the professional lives and inquiries of the three teachers.

However, this research leads also to larger issues, i.e. to suggestions for new hypotheses that may foster ongoing research and guide the development of a body of new knowledge about university teachers and their professional development.

Generating some testable hypotheses

Five hypotheses to be further tested are offered here to enhance the body of knowledge about the role of reflective engagement in professional lives and development of university faculty members.

- Reflective engagement, facilitated by the portfolio process, makes possible a new consciousness of one's teaching practices and precipitates redirections and elaborations of one's teaching practices.
- Redirections of practice can differ in emphases. They take shape as a result of several elements: one's own history of learning about teaching and learning; the level of awareness of one's practice, including the needs of students, largely

brought to consciousness through engaging in reflection; the institutional and epistemological context in which one works that can facilitate or thwart the reflective process.

- Reflection on one's practice can take place over long periods of time and can be ongoing into the future.
- Reflective engagement, whether for faculty members or students, needs a scaffold, a serious active programme. It cannot come about by mere suggestion. It demands systematic, sustained inquiry.³
- Institutions can facilitate the process by awards, promotions, courses offered, validating views of knowing and learning and providing forums in which staff can share their teaching practices on a regular basis.

Reflective engagement may now be defined. Reflective engagement involves a deliberate and intentional act of interrupting, or suspending, one's teaching practices to interrogate or inquire into them systematically and to heighten one's conscious awareness of one's practices and of one's students and then using that consciousness to redirect one's practice and actually acting to change. This intentional act of inquiry may engage a person alone or in collaboration with others, colleagues, students, other practitioners or researchers. Attention is paid to gathering and examining evidence of teaching and of student learning, of what students know and understand, as a ground for reflective inquiry. The process is likely to be sustained over long periods of time and benefit from collaborative review. It likely involves narrative, for it is a story of meaning, and it can raise ethical issues for the people involved. Reflective engagement leads to the construction of new knowledge; new meanings, understandings, new knowledge of practice, of processes, of the content and theories, of the people involved.

When UCC began the Award for Excellence in Teaching it opened up a new way for members of the community, the faculty members and, in some instances, students, to engage with one another. But fundamentally the college encouraged teachers to be reflective on their own learning. Important achievements were made by the faculty members, as they attest. However, critical questions still remain. Can this work be sustained? For how long? Would a new administration do away with the teaching awards? With what consequences? Can the work be expanded? Made available to all? What might stand in the way or facilitate new progress and important discoveries? Further probing of these questions may help to sustain the ongoing search, the process of discovery of possibilities that enrich the professional lives and development of university teachers.

Notes

1. Professional development for university faculty can be dated from the 1960s and 1970s. Prior to that time most considered their academic degree the pre-eminent professional training. Remaining current in the field and carrying out research were the royal roads to upward advancement. Institutions of higher education provided research grants, travel funds to attend conferences, etc. It was in the 1960s and 1970s that new approaches to professional

development came about, especially as higher education institutions were faced with new baby boomers and increasing numbers of non-traditional students (see Stanley, 2004, for a historical review). The most dramatic challenge to professional development came with Boyer's (1990) *Scholarship reconsidered*.

2. Reflective engagement using Donald Schön's template is relied on by many researchers and practitioners. Indeed, it was Schön's (1983) *Reflective practitioner* that triggered renewed interest in the process in the 1980s and spurred the renewal of interest in Dewey's work. Schön's ideas of reflection in action and on action and his concept of reframing the puzzles of practice have been especially important for practitioners in many disciplines.
3. Scaffolding for reflective engagement may take a variety of forms, as the cases presented here suggest and the biochemistry and finance professors indicate. See Schön (1987, 1991), as well as Huber (2002), Hutchings (1998a), Shulman (1993) and Becker and Andrews (2004), for other examples.

Acknowledgement

I want to thank all those members of the UCC faculty who so generously shared their teaching experiences and their responses to the portfolio process in seminars and interviews.

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