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Teacher reflection and theories of learning online

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Abstract

Many universities have pursued the development of online offering of their subjects with enthusiasm, with a perception that ultimately such offerings will increase the availability of the subject and be a cost-effective enterprise. As yet, little attention has been paid to the potential for online subjects to encourage deep learning in students who undertake them. This paper considers some current understandings of students' approaches to learning and examines the potential for online subjects to provide a positive teaching/learning environment. It concludes that, as in the lecture theatre or tutorial room, the virtual classroom can succeed through reflective teaching underpinned by the solid application of theories of learning.

The proliferation of online subjects offered by universities seems to have come with a rush. The promise of offering services to students far removed geographically from the physical university is attractive and in line with government policy that encourages flexible learning strategies for improved access to education (Anderson et al 2000). Added to this is the intuitive impression that such offerings will cost less than face-to-face teaching, thus meeting the institutional need for competitiveness and economy (Edwards & Nicoll 2000; Press & Washburn 2001). Unfortunately, the indications so far are that this optimism is mistaken, with estimates of time taken to produce one hour of online teaching rising to as much as 200 hours (Roach 2001a).Nevertheless, university departments and schools have embraced the new technology with something like evangelical fervour, although its cost effectiveness and pedagogic integrity are still uncertain (Ng 2000).

Many issues have arisen for those involved, regarding management of the technology, provision of sufficient staff and resources, the day-to-day running of the subjects and the prevention of cheating (Arnold 1999; Roach 2001b). One area that has received little attention from researchers is the effect of this type of subject presentation on student learning.

This paper is a consideration of the relationship of online teaching with student learning. Firstly I discuss the current understanding of student learning by examining some learning theories. I then examine a selection from the rapidly burgeoning field of literature about online education to consider how it relates to the previously discussed theories of learning. Discussion then proceeds to some thoughts about presentation of online subjects to achieve 'best practice' results in learning. I conclude that, if developed and carried out with well-considered and applied theory, online education has real potential for assisting students to achieve high quality learning.

Learning

Early approaches to understanding learning have leaned heavily to the psychological and have been notably unsuccessful. Biggs (1999, p 10) puts this failure to achieve results down to a preoccupation with developing the 'one grand theory of learning'. For example, behaviourists developed theories about learning by conditioning, rewarding behaviour conducive to learning and using negative reinforcement to discourage behaviours not conducive to learning. Phenomenography is a perspective that sees learning as a relationship between the learner and the learning experience (Prosser & Trigwell 1999). On the other hand, another basic theory of learning – the constructivist approach – commonly uses an information-processing model of learning, which involves encoding information to the unit (student), storage and retrieval. From this perspective, the emphasis is on the construction of knowledge by the student (Chalmers & Fuller 1996). According to Biggs (1999), phenomenography and constructivism share the basic proposition that knowledge will not be constructed in a meaningful way unless it is created by fruitful approaches to learning on the part of the students.

Several different types of learning have been identified and categorised:

- cognitive – acquisition of knowledge;
- affective – analysis of feeling, values and emotions;
- content – learning of the syllabus; and
- process – approach and action of a student's thinking processes.

Thus, education should aim to give students knowledge (cognition) and appropriate social values (affect), with the ability to retain these (content) and to think about and analyse them (process) (Biggs & Telfer 1987).

Teachers generally perceive learning as being a function of one of three variables (Biggs 1999). Firstly, they may believe that learning is a function of what the student is; the more intelligent, able and motivated the student, the more they will learn. A recent model in American education gives this kind of learning the name of 'student as product'.

> Under this model, the instructor may be likened to a factory worker on an assembly line. As the student passes by, each instructor uses expository and demonstration methods to inject a certain body of knowledge into the student. (Williams 2001, p 5)

Secondly, learning may be perceived as a function of what the teacher does. A good teacher will provide variety and interest and is likely to rate well with the students and feel satisfied with a class that is well organised and well controlled (Ramsden 1992).

The student-as-consumer model is also teacher-centred and, along with similar approaches, does not make allowance for individuality in learning or uses of learning.

> … the student visits the university supermarket, selects a box of history and a quart of philosophy from the shelf, proceeds to the checkout stand, pays the bill and leaves with education in hand. The faculty member's job becomes that of packaging knowledge so attractively that the student will be drawn to select that package, open the package, and consume some of its contents. (Williams 2001, p 6)

Thirdly, the focus shifts to the student's learning. This links closely with the 'student-as-worker' model (Williams 2001), in which the teacher uses many cooperative and interesting strategies to encourage the student to learn, treating the classroom with similar control to that found in the workplace. Teaching is done to make learning possible (Ramsden 1992).

Attempts to characterise students through various theories as types of learners have produced several ideas with related jargon that polarises students at one or another end of a spectrum. Thus, a learner may be 'syllabus-bound' or syllabus-free'; be a 'cue seeker' or 'cue deaf'; have a 'need for achievement' or a 'need for affiliation'; be a 'neurotic introvert' or a 'neurotic extravert'; or be a 'surface atomistic' or 'deep holistic' (Ramsden 1992; Wilson 1981). Such labels have their uses, but must be treated with caution. There is a well-recognised danger in categorising students, which can result in teaching becoming 'a source of diminished self-efficacy, convincing learners that they are not cut out to succeed, or not inclined to learn' (T'Kenye 1988, p 151). Effective teaching, on the other hand, can 'facilitate a meaningful engagement between a learner and content' (T'Kenye 1988, p 151).

Effective learning, then, is related to the level of engagement of the student. Students with a high level of engagement are active participants in the process of education; students with a low level of engagement depend on activities such as notetaking and memorising, rather than on reflection or application of theory (Biggs 1999). It is easy to blame the students' motivation or, in the current climate, the marks achieved in their final pre-university year, but educators in higher education continually tell us that it is possible to encourage students into learning through reflective teaching.

What, then, is reflective teaching? Arseneau and Rodenburg (2000, p 139) give a pithy description of what it is not, when they say: 'ten years of experience without reflection is just one year's experience repeated nine times'. Ramsden

(1992, p 15) uses a fictionalised case study about Kevin, a teacher who has 'developed an ability to step back from the immediate events of the lecture room and practical class and see what is happening to the quality of students' engagement with the content'. Reflective teaching requires this skill. This kind of teaching goes further than that engaged in by the teacher who – as in another of Ramsden's case studies – structures the class to make it interesting and fun, and evaluates successful learning in terms of student participation and the positive response on the *Quality Assurance Student Evaluation of Subject* forms distributed at the end of semester. Reflective teachers ask questions like:

> What worked? Why?
>
> What didn't work? Why?
>
> Was the sequencing of material appropriate and helpful?
>
> Was the pace appropriate?
>
> What would you do the same next time?
>
> What would you do differently next time?
>
> (Arseneau & Rodenburg 2000, p 139)

Kurt Lewin is quoted as saying, 'There is nothing so practical as a good theory'. Educational theory as previously discussed is only practical if it can underpin action taken by reflective teachers, who can use it along with their observations to reflect on and improve the classroom experience. From the theory, it is clear that transmission of knowledge is only one part of the learning process. This knowledge requires encoding by the student and the ability to draw relationships and understanding and meanings from it.

To do this requires the teaching/learning process to be a cooperative process between teacher and student. The speculative and reflective teacher will continually consider the students' learning in order to identify lack of understanding or other barriers to learning, and use strategies and methods to rectify them. Thus, the role of the teacher shifts from transmitter of knowledge to facilitator of the students' encoding processes; a shift which requires close attention to the voices of the students and other teachers to achieve the best teaching practice (Ramsden 1992).

Biggs and Telfer (1987) put forward a model of learning involving presage (factors brought to the learning situation by the student and actual situation factors); process (which is determined by students' approaches to learning); and product (or outcomes). An adaptation of this model was used by Prosser and Trigwell (1999) to more fully explain variations in student learning. Often little can be done about the factors tertiary-level students bring to the classroom: many years of previous knowledge, varying abilities and levels of motivation, and so on. The situational

factors, on the other hand, can be manipulated to encourage learning – but to do that effectively, it is essential that the teacher understands how students learn.

In recent years, teachers' understandings of learning have crystallised into definitions of approaches to learning as 'deep' or 'surface'. Deep learning will occur when students approach a task with the goal of understanding it as well as possible. Learning will be surface when students approach a task with a goal of completing it as quickly as possible, often for little other reason than to meet assessment requirements (Evans & Abbot 1998). Using this understanding requires the consideration not so much of the way teachers teach, but of the way learners learn.

Biggs (1999, p 22) says, 'Surface and deep approaches to learning are not personality traits, as is sometimes thought, but reactions to the teaching environment'. Thus, manipulation of the teaching environment is often required for successful learning. Many critics feel that this is extremely difficult in the typical climate and culture of the university which, through the lecture/tutorial format and the assessments requiring regurgitated facts, rewards students for surface learning (Ramsden 1992). Part of deep learning is the ability to ask useful questions about the material being presented (Cowan 1998), and the lecture format of university life tends not to allow much opportunity for this.

Teaching online

Perceived roles of online teachers can fall into the same categories as for classroom teachers, in spite of the fact that online teaching moves traditional teaching skills from the physical classroom to the virtual one. Research carried out through email interviews by Smith et al (2001, p 18) found that:

> some instructors feel as if a lifetime of teaching skills goes by the wayside. They cannot use their presence and their classroom skills to get their point across. Nor can they use their oral skills to improvise on the spot to deal with behaviour problems or educational opportunities.

Teaching online might be seen to produce learning through what the teacher does; it can simply be transmission of knowledge where the formal, spoken lecture becomes transformed into a written presentation of online text. It is still the case that some online subjects are simply poorly revamped distance education packages, containing a text full of information and references for further reading and some questions for assessment. Using a computer to teach does not necessarily change the way lecturers understand learning. Use of computer technology can encourage surface learning in the same way that poorly considered lectures, tutorials and assessments (no matter how well presented) can encourage it.

The teacher-focused approach can be well ornamented online; the online teacher can provide the equivalent approach and control, and fun, interesting activities to keep students busy. The online text can be supplemented with

interactive games and quizzes, animations and links to websites. Whilst such activities can encourage deep learning, they will not provide an automatic guarantee of it. They should be an outcome of teacher reflection, not a substitute for it.

Let us, then, go back to the beginning. The transmission of knowledge is a first basic step in learning by the student. It is usually fair to presume that lecturers faced with convening an online subject do have the knowledge, but the facility with which they transmit it is variable. Nonetheless, teaching for learning presupposes knowledge of content and the skills in presenting it with well-structured student activity and additional techniques – ie the cooperation between teacher and learner previously discussed (Ramsden 1992).

University lecturers are not necessarily employed for, or even with, formal teaching education and training. More often, they gain their positions because they have other academic qualifications, research skills, publications or expertise in particular disciplines. It could be argued that these academic pursuits are often associated with the introversion of the scholar rather than the extraversion that may be accompanied by an ability to hold an audience, or the possession of a warm, friendly personality that will effectively engage and motivate students.

In the classroom, the lecturer is required to transmit knowledge to a variety of learners.

> Some students … are happy to sit in obscurity at the back of the lecture hall or seminar room, keeping their heads down, listening to what others are saying, recording what they consider to be useful. Others wish they could find the courage to participate actively, but find themselves unable to do so, and experience low self-esteem as a result of their perceived inadequacy. Others relish the opportunities which small-group teaching sessions offer for voicing their opinions and debating issues with tutors and fellow students. (Evans & Abbot 1998, p 64)

What a challenge this presents for the classroom teacher! The formal lecture in the physical classroom remains the safest mode of teaching here. At least all participants have the same information transmitted to them. There is no demand on the lecturer to differentiate between the back row student who has no wish to participate, and the one who wants to but is too timid. There is no pressure to ‘think on one’s feet’ or to make opportunities for students to ask questions. Crowd control might be the major issue, but if the lecturer’s job is simply to transmit knowledge – without thought for its reception and processing – then this is probably not too onerous.

However, neither students nor lecturers like this form of teaching/learning (Sander et al 2000). Introverted scholars who are required to teach want to do it well, and whilst they can fulfil the content requirements of lectures to large groups, they get no pleasure from student evaluations that might call the classes ‘useful but boring’.

Teaching online can remove some of the pressure here. The lecturer can transmit knowledge through interesting media and has time to consider answers to questions without being committed until she/he has clicked on the ‘send’ button.

The pedagogy that required lecturers to present a lot of words to be processed by students gathered in the same physical space is no longer relevant in online teaching (Tilson et al 2001). This is seen as a very minor problem (or indeed, a major improvement) to many critics who have considered for a long time that such methods have limited value, in spite of being the most commonly used. Tilson et al (2001, p 488) contend that:

> Cognitive learning on the Internet tends to be better than learning in person if the strengths of the Internet are used. Cognitive learning includes facts, data, knowledge and mental skills such as analysis and synthesis. Students learn more quickly online. This is true in part because they don't have to spend as much time reading and commuting to class. Also, once they are in a learning activity, there are fewer distractions such as people talking in class or irrelevant (to a particular learner) discussions that "use up" available time. It appears that cognitive learning on the Internet may take only about half the time of classroom learning.

Students have identified some basic principles about the usefulness of lectures and tutorials (Evans & Abbot 1998). Lectures should have recordability; that is, students should finish the session with useful notes. Well-structured handouts of lecture notes are even better. Lectures should be comprehensible; the information imparted should be useful for assessment of the subject and the vocation with which it is associated; content and delivery should be interesting; and tutorials and practicals should clarify the information given in lectures through discourse in small groups.

There is nothing here that cannot be as well fulfilled online as in the classroom. Better than handwritten notes taken in a lecture – which probably miss important points – is content which can be partially or fully downloaded, reproduced in hard copy or simply brought up on the screen as required. The comprehensibility and relevance of the material is dependent on the knowledge, understanding and skills of the person presenting it, and this is no less achievable online than otherwise. In the virtual classroom, the interest value of the content and delivery also depends on the creativity of the teachers and their ability to inspire and motivate.

The same principles of teaching for learning apply in the virtual classroom as in the physical classroom. The same understandings of the role of the lecturer also apply.

> I have personally seen examples of computer-assisted learning (CAL) programs in higher education which do no more than present the information to be found in a book and test whether the student has memorised it; the computer becomes an electronic page-turner that rewards a surface approach to learning (Ramsden 1992, p 160).

This is not a competition between teacher and computer, but effective online teaching will see the lecturer's role broaden from purely 'information deliverer' to 'mentor and manager' as well (Robson 2000).

As described by White and Weight (2000), the goals for online learning are for students to comprehend the world and go on learning, see relationships and make more meaningful integrations, and be exposed to deeper and widening interests.

These fit well with Ramsden's (1992) description of the deep learner, who has the ability to focus on the significant and relate knowledge gained in the subject with previous knowledge – knowledge from different courses and other life experiences – and can relate theory to practice and so on. The goals for online learning are the same as the goals for learning in general.

Many critics express doubt about whether online subjects are capable of meeting these goals. Watts (1999) discusses the Information model (IT), which is teacher-oriented, relies on textbooks, memory tests and precise definitions, and emphasises questions with right or wrong answers, rather than allowing critique or reflexivity. He compares this with the Action Reflection Theory model (ART), which requires 'skilful interpretation, translation and critique – or reflexivity … essential and central skills that constitute all human activities understood as relational and social' (Watts 1999, p 10).

His description of these two models has factors that link closely with deep and surface learning. Watts argues that there is a danger of naturally leaning towards the IT model for online learning, and that there is a need to incorporate Action Reflection into the curriculum if pedagogical integrity is to be maintained. Ling & Ling (1998, p 33) are more optimistic, embedding themselves in what Watts (1999, p 2) calls the 'Aint Modernity Great' tradition. The Lings propose a scenario in which:

> … the university could be reduced to an under-privileged provider of information with no greater identity than an icon on a Web-page, and the academics reduced to employed authors of directories of information peddled by an electronic kiosk, serviced by technicians and the occasional graphic artist …

They conclude that 'the features of the current era can be seen as presenting a challenge rather than a threat' (Ling & Ling 1998, p 39). They do not deny the potential that online teaching has for mass-produced transmission of knowledge – becoming subject to the supermarket view of education – but claim that it has just as much potential for being empowering, as long as the human element is maintained and universities use the technology 'in a manner which asserts human, intellectual, moral and pedagogical credibility' (Ling & Ling 1998, p 39).

One threat posed by online subjects is the loss of the 'humanness' necessary to teacher-student interaction if deep learning is to be encouraged. In order for a teacher to carry out the 'reflexive and speculative' observation required for teaching for learning, he or she must be in an interactive relationship with the students. An apparent disadvantage of online subjects must be the absence of a 'warm body'. Many online subjects overcome this by using an initial and/or occasional 'real' classroom session to meet the lecturer and to assist in mastering the software, but this is not always possible.

Compensation for the physical absence of a teacher can be best achieved with care in the use of language in presentations and communications – outcomes generated by a reflective teacher. Quinn (2000) also emphasises the importance of a supportive environment through language for maximising learning. In the same way

that the reflective teacher will set the tone and direction of the class through various forms of communication, so the online facilitator can use 'control talk' to do the same thing.

Online messages can be as friendly, personal and responsive to student needs as the facilitator wishes to make them. Students should be encouraged to introduce themselves to the group and the facilitator should endeavour to personalise their responses, eg: 'Hi Fred. I see you are from Flossville. I was there for a conference a couple of years ago. I must say the Secondary College looked an impressive building. Did you attend there?' Students who feel confident and have a sense of belonging to an online group will congratulate each other on postings, share anecdotes, express concern if a member is 'missing', and generally contribute thoughtfully to discussion.

A sense of belonging is not achieved automatically but presents an important challenge for the online teacher, who must devise ways through which the students can get to know each other – the online equivalent of the 'getting to know you' games employed by many teachers in the initial tutorials in face-to-face teaching. These can be simply online adaptations of typical introductory games (eg introduce yourself and tell us who is your greatest hero or heroine and why?), or lecturers can employ strategies such as encourage students to email each other, participate in a threaded discussion or a chat group, or post relevant photos to the discussion.

Having established a supportive environment, the online lecturer must maintain it through constant and regular communication and monitoring – not be seduced into allowing 'the technology to be the teacher, disabling the traditional dialectical relationship between teachers and learners' (Ling & Ling 1998, p 39). Good organisation and reliability is essential. Small groups (about ten students) work the most effectively. Where subjects have large enrolments, it is possible to arrange the students into several small groups, each of which function as a tutorial group, and then feed their discussion into the larger group at regular intervals.

However, be warned! Organising a class in this way requires greatly increased monitoring, organisation and involvement on the part of the teacher – it is more than the equivalent of running a similar number of face-to-face tutorial groups. Not having to be present in a classroom at a particular time does not excuse the teacher from regular and punctual communication. Lecturers should make material clear and available at the specified pre-arranged times, respond to emails within one or two days, and comment on postings. The online teacher should be as visible to the class as the classroom teacher. Dividing the class into small groups multiplies these obligations, but there is a sound pedagogical gain in having only a few students per group, with greater group cohesion, increased student participation, and more opportunities to explore issues in depth (Lublin 1987, p 1).

Reflective teachers also know when to stand back and allow students to work through their own issues and tensions in the group situation, and when they need to intervene. It is sometimes surprising what students will post online – comments and opinions that you would rarely hear in a classroom situation. Such frankness can

lead to 'flaming' – angry exchanges within a group – and may require speedy intervention, perhaps in the form of a private email to the offender and/or the offended, which is sometimes sent by the facilitator, who thus involves him/herself in the discussion (White & Weight 2000, pp 142–143). More often, however, the facilitator logs on to find that students have already dealt with offenders themselves, often more effectively than could have been achieved with censure from the top – and only a final smoothing of the troubled waters is necessary.

The use of humour can deflect tensions or simply make interactions more enjoyable. Even the more serious-minded lecturers can be funny online, because they have time to work on the appropriate response or 'try out' jokes before posting them. One fun way to encourage students to communicate is through emoticons – symbols made up of combined typographical characters, such as smilies :-) or winkies ;-). Students are often amazingly creative in expressing themselves through their own original emoticons (White & Weight 2000, p 31).

Online teaching requires far more than simply setting up a subject, then sitting back and watching from a distance as it rolls along. The human, intellectual, communication and information technology resources required to sustain it are enormous and must be recognised by universities, with appropriate allocation of funding, time and support (Ling & Ling 1998).

I would argue that reflective online teaching is just as likely to stimulate deep learning as face-to-face teaching – maybe more so. Students who log in are initiating a classroom encounter in their own time and at their own convenience. This flexibility would logically improve motivation and enthusiasm for 'turning up' to classes. Students in a study described by Smith et al (2001, p 18) also made the observation that the 'emphasis on the written word encourages a deeper level of thinking'. Online discussions are protracted and students have the opportunity to consider their views for a long time before offering them in interaction with the lecturer and other students. They are likely to engage in discussion more assertively than they would in face-to-face interaction – sometimes even aggressively. A study by Goldsmith (2001) produced similar results to the findings here; students expressed appreciation of the fact that they have time to think about responses to questions, saying that they are more honest in online discussion where there is a feeling of some anonymity, even though names are used.

Many of the concerns about online teaching can, I believe, be addressed through consideration of theories of learning and reflective teaching. In order to be successful, online teachers must do as the reflective face-to-face teachers do; that is, understand how their students learn, and adapt the teaching environment accordingly. The media is different, the mode of transmission is different … but the principles of reflective teaching, students' approaches to learning and their responses to the educational environment remain the same.

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