Engagement by design: Marrying pedagogy and technology for better learning conversations via asynchronous electronic discussions

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Abstract

With increased use of online discussion groups, academic staff have greater opportunities to see how students are responding to and addressing learning issues. Careful attention to pedagogical issues at the course design and writing stages helps to optimize student engagement with the learning content, particularly by integrating such discussions into the course design. Further, by making explicit links to course objectives, teaching and learning goals, and the broader expectations of other key stakeholders in the Faculties and professional bodies, it is more likely that participants will view the discussions as an integral part of an authentic learning environment.

This paper will use the ADDIE (Analysis, Design, Development, Implementation and Evaluation) instructional design approach as a framework for planning the incorporation of electronic discussions as a learning tool, at the same time allowing for flexibility to accommodate changing learner/teacher needs. Ideally, the pedagogical issues need to be addressed at the initial stages of development. However, in reality this ideal may not always be possible, so this paper will suggest other strategies for incorporating discussion groups into the learning and teaching environment after the key resources have been developed. This discussion of pedagogical issues draws on contemporary literature, and is supported by examples from various disciplines.

Introduction

It is almost superfluous to state that education in Australia is undergoing major change, in part because of recent government reviews, and also because of the rapid changes in other areas of society. There is greater emphasis on establishing a "knowledge society", founded on a knowledge-based economy (DEST, June 2002; Ministerial Council on Education, Employment, Training and Youth Affairs - MCEETYA, 2001). Also, contemporary education design is more likely to refer to 'learner-centred' design, highlighting a move away from "teacher-centred" approaches where knowledge was transferred from expert to novice (Berge, 2000; DEST, June 2002). This means an increased emphasis on designing learning and teaching environments which allow for flexibility and accommodate a range of learning styles. They must also include opportunities for ongoing communication with students, to keep pace with learning issues, to gather feedback on student responses to their learning environments, and to negotiate meaning as the course progresses.

While such change might mean greater choice and involvement by learners in decisions about their education, it also means developing new skills and knowledge about this changed environment, often with expectations of greater "visibility" through participation in online discussion groups or other forms of electronic communication. Similarly, it inevitably means changes for staff as well. Collins (2000) highlights the socio-emotional transitions teaching staff undergo as they try to adjust their teaching styles to unfamiliar delivery technologies. This adjustment may be heightened if the teacher has not had an active role in deciding on the technologies to be used, or has 'inherited' the course and is teaching it for the first time. Just as

students need support to adjust to changed learning environments, so too do staff: technology skills; time-management; workload; resources; and knowledge-management are some of the challenges shared by staff and students.

Emerging research on the role of online discussions in facilitating learning suggests a range of benefits, as long as the purpose of such discussions is clearly explained and they are well integrated into the course design. Berge (2000) lists authentic learning, inquiry learning, problem solving, reflective learning, and possibilities for collaborative learning as just some of the more commonly used approaches to facilitate learning in online interactions. They are also frequently used to help develop social presence, to provide encouragement and feedback to students, to practise specific forms of communication relevant to the subject being studied, and to expose students to diverse perspectives or approaches to an issue. In addition, such discussions may be a venue for students to raise issues for clarification, to share resources, and to develop interaction skills relevant to their chosen career. As experience in using online discussions grows, researchers are gathering examples of best and worst practice to assist other teachers and designers.(See Klemm, 1998; Chism, 2003; Rohfeld & Hiemstra, 1995.) Also, a clearer picture is emerging as to critical variables to be considered in planning and integrating a discussion component into course design. Fundamental issues such as access to relevant technologies, reliable, low-cost service provision, basic information technology skills, and time to process the often-hundreds of messages may dissuade both students and staff from persisting with online discussions

For instructional designers and other academic staff, there are significant challenges in accommodating sometimes competing priorities to establish and maintain pedagogically sound education environments. Limited time and other resource constraints must be taken into account, and for some staff, engaging with and mastering new technologies may be seen as a burden rather than an opportunity. However, staff and students may be more inclined to persist if there is a perceived benefit from engaging in online discussions. Cox, Clark, Heath and Plumpton (2001) describe as “unique” the role of the online tutor/facilitator, and suggest several strategies to facilitate more positive online learning experiences. Proctor (2001) notes some of the positive aspects on online discussions, including peer feedback, a retrievable record of learning conversations, and collaborative knowledge construction. However, she also raises issues of access and equity, lack of participation, inappropriate behaviour, and the drawbacks of “bad writing and poor thinking”.

Ideally, access issues will be considered as part of the analysis stage of course design, matching expectations against entry requirements, and anticipated learning outcomes. If the general profile of course enrolments change, or if discussion groups are introduced post-course design, the analysis issues raised later in this paper will still need to be considered. The DEST *Striving for quality* issues paper notes that there has been an unexpected benefit from the introduction of information and communication technologies (ICT), in the form of renewed interest in learning and teaching in higher education (June 2002). However educators must bear in mind that reliable and cost-effective access is still not a reality for certain students, especially those in disadvantaged socioeconomic situations or remote locations.

Principles of universal instructional design (UID) are meant to accommodate the diverse needs of students from a variety of education backgrounds, and in a range of diverse contexts. The University of Guelph' Teaching Support Services suggest that "all students should be able to fulfill course requirements without special accommodations", and they list seven key principles to guide UID:

- Accessibility and fairness to all parties
- Flexible use, participation and presentation
- Straightforwardness and consistency
- Explicit presentation, readily perceived
- A supportive learning environment
- No unnecessary physical effort or requirements
- A learning-teaching space, which accommodates both students and instructional methods.

(http://www.tss.uoguelph.ca/uid/uidintro.html)

In this paper, these principles are considered to apply to the development of the whole course environment, but the specific focus will be on the scope for using electronic discussion groups to match design principles with the various expectations of the main participants – students, staff, governing bodies, and accrediting authorities as well as employer groups. Some of those expectations are expressed variously through statements of learning outcomes, teaching objectives, graduate attributes, development of generic skills, or other performance criteria, depending on the course context. Increasingly, universities are providing statements of general expectations in the form of graduate attributes, in many cases focused primarily on undergraduate

students, but in others, following through to expectations of postgraduate students also. Such statements appear in national as well as international education environments, particularly on university websites and their academic documents. (For example, see http://www.usq.edu.au/planstats/PS/graduateattributes.htm also http://www.tlc.murdoch.edu.au/gradatt/gaothers.html)

Education providers are revisiting the needs and expectations of key stakeholders, and reviewing current practices to determine whether or not education programs are able to meet those expectations. These challenges are engaging policy makers not only nationally (NOIE, 2003) but also internationally (Department for Education and Skills, UK, 2003; Fulton, 1997), and often appear in related literature outlining employer expectations (Luca & Oliver, 2002; Swinburne University of Technology, 2002).

In the *Higher education at the crossroads* review document (DEST, April 2002, p. 2), it is stated that '…a learner-centred institution will ensure that students acquire and develop knowledge and skills that are relevant to the individual, employers, professional associations, labour market and society. They will inspire learning for life…'. This is explored further in the issues paper *Striving for quality* (DEST, June 2002, p. 13), which notes the need for "emerging"skills and knowledge including:

- Initiative and enterprise skills
- Information literacy and management skills
- Capacity for lifelong learning
- Ability to adapt learning to the work context
- Flexibility to operate effectively in multidisciplinary contexts.

Implicit in these is the shift from a teacher-centred approach to a learner-centred approach, where learners assume a greater role in identifying and managing their immediate and future learning needs. Also implicit is the need for flexible learning and teaching environments, where there is scope to respond to change in a sustainable and resource-effective way. Pedersen (2000) highlights the challenges in identifying desirable graduate attributes, and outlines a strategy adopted by the Business faculty at his university. His research highlights the need for clear pedagogical goals in designing and teaching higher education courses, as well as clearly thought out assessment and evaluation strategies.

Ideally, in the generator model of instructional design, inclusion of discussion groups would be part of a comprehensive planning process which takes account of all of the above issues. However, where courses are being updated or adapted, a transformer approach may be used, and the discussion group added to complement the existing learning environment. In this case, where the purpose of the online discussion has not been closely linked with the overall course design, it may be inappropriate to make online discussions assessable – rather, to use them for less formal discussions and feedback, and to foster a social learning environment. Still, the facilitator would need to explain any expectations and choices for students at the earliest opportunity.

Context

Contemporary education contexts are a mix of opportunities and constraints, shaped by policies, funding and other resources (or lack of them), institutional priorities and initiatives. At the authors' university, although distance education courses are still

largely print-based, there is increasing development along the lines of Taylor's fifth generation model of distance education (2001), as well as growing numbers of trial projects in the hybrid delivery initiative.

In his final graduation address as USQ Vice-Chancellor, Professor Peter Swannell talked of the "massive paradigm shifts" of the past five to10 years, noting:

> The emergence of user-friendly, powerful information and communications systems and the allied reassessment of what are legitimate social and educational expectations for our nation, have guided us in the way we have sought to move the university forward.
>
> (Swannell, 2003)

. At the authors' university, online courses are delivered mainly on either the Blackboard or WebCT Vista platforms. Each has differences which entail specific design and teaching considerations. To date there is little conclusive research to determine which environment offers the most student and teacher-friendly environment, although both staff and students have provided informal feedback on both. Use of dual online environments inevitably raises issues of resourcing, skills development, support, maintenance, and cost-effectiveness. Part of the overall consideration in an evaluation process (discussed later in this paper), is to try to be clear whether or not feedback relates to the technologies being used, or to their employment as tools to facilitate learning. Increasing student awareness of those issues would help inform their thinking as to the potential value of specific skills, knowledge, and academic literacies relevant to their chosen discipline or professional area. This applied, or authentic learning approach may be facilitated by staff using

reflective learning, problem-based learning, or portfolio development as a way to engage students meaningfully in learning activities that last.

Methodology: Design and Development Models

In today's world, with an emphasis on lifelong learning, learning and teaching is more that a series of procedural steps or learning stages. It can be the process of translating general principles of learning and instruction into a design for your course, with due consideration to the context of the learning environment. Two possible models are presented in this paper. The Instructional Systems Design (ISD) model and the Eighteen Step Model that expands the ISD model and is particularly focused on web based learning.

The Instructional Systems Design (ISD) provides one framework for the systematic design, development and management of educational materials and programs. This systematic model of instructional design is often referred to as the ADDIE model because it consists of five phases - analysis, design, development, implementation and evaluation. The activities the educator undertakes in the ADDIE framework include:

- Analysis of the program in order to completely understand it, and then articulation of the learning goals to be achieved in order to correct any shortcomings or faults within the program.
- Designing a method or model to achieve the learning goals.
- Development of the model into educational courseware.
- Implementation of the courseware.

- Evaluation of the courseware throughout the process to ensure it is achieving the desired learning outcomes.

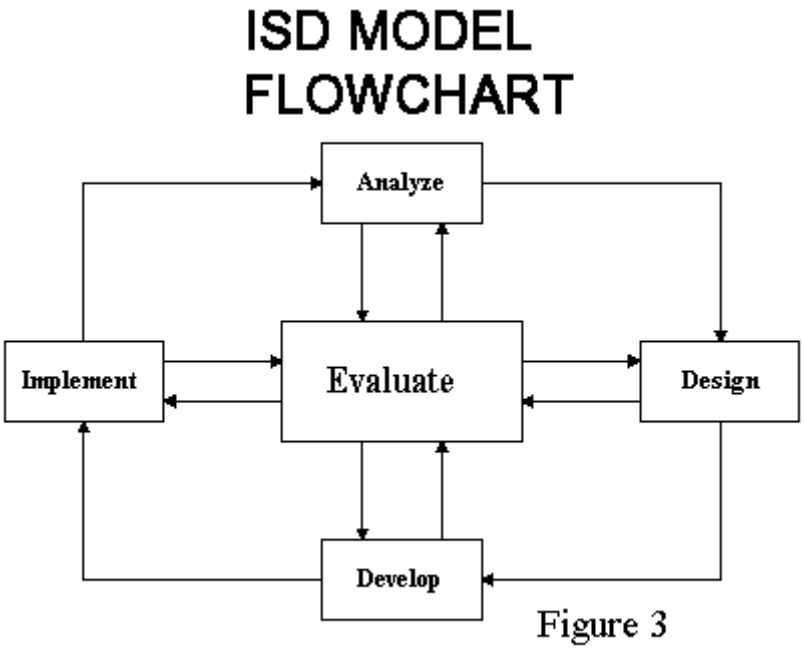


Figure 3

Clark's (1997) Figure 3 (above) highlights the importance of evaluation and feedback throughout the entire training program. It also stresses the importance of gathering and distributing information in each of the five phases and shows the educational process is not a static, linear model, but an iterative flow of activities.

Analysis

The analysis stage of designing a flexible program generally involves analysing the learner and the learning context, assessing learner needs, and determining instructional goals and learning outcomes, and analysing the content. Here are five basic steps that can help you analyse your current environment and make an informed and sound needs assessment decision.

1. **Analyse the Learning Context** It is best to perform a learning needs analysis early in the process. Often this happens during the course accreditation process and course leaders may have little input or even knowledge of the background of the learners

2. **Evaluate Existing Materials** You may be given leadership of a course that already exists, or plan to update a course you have run over several semesters. These materials can become an integral part of any new or revised materials.

3. **Identify Gaps:** Any learning outcomes to be addressed that are not covered in existing material

4. **Consider Your Options:** Once you have identified your learning goals and outcomes consider your possible learning options

5. **Plan Your Learning/Teaching Strategies:** The findings from the analysis phase will now inform your course design.

Design and Development

Once you have conducted an analysis your context and subject matter or content, you need to consider the sequencing of content, media selection, deciding on what learning strategies to use, how learning outcomes will be assessed and feedback provided – the design and development phases of our framework. Sequencing and synthesising of content has to do with decisions about how we organise what needs to be learned. The choice of your approach to sequencing and synthesising content is a complex process: it must take into account not only the nature of the content, but also your learners and your own philosophical approach to learning and cognition as well

as the reality that people have different learning styles and preferences (*Designing Instruction for Flexible Learning* – FET5601).

Your design choices should be informed by educational theory. Over the last decade constructivism has been increasingly informing the pedagogical fundamentals of teaching and learning. Constructivism places the emphasis on the knowledge the learners brings to the educational context, with learning being primarily developed through activity. Social constructivism moves a way from the focus on the individual, towards a new emphasis on social contexts for learning. This pedagogy favours a learner-focussed approach to teaching and learning, with a focus on dialogue, learning partnerships, and the joint construction of knowledge (McDonald & Reushle, 2002). In the online learning context the synchronous and asynchronous tools (discussion groups, email, and virtual chats) provide environments for collaborative group learning, where learners can actively exchange ideas and co-construct their knowledge within the context of an online learning community (Wenger, 1998).

The use of online discussion forums is supported by Laurillard (2002, p. 22) who argues for the idea of a "conversational framework" for learning, which she believes captures the essence of university teaching as an "iterative dialogue between teacher and student(s)". She proposes that technology can be used to engage students by exploiting "the communicative, interactive, and adaptive capabilities of the technology" to facilitate this iterative dialogue (McDonald & Reushle, 2002). Palloff & Pratt, (1999, p. 15) also note, "in the online classroom, it is the relationships and interactions among people through which knowledge is primarily generated". Therefore, while there may be some common discussion points each semester, the

conversations about those issues may vary significantly with each cohort, reflecting to different backgrounds, expectations and thinking approaches for each cohort.

Implementation

At this stage various decisions on learner access, technical aspects, media selection, and information presentation are implemented and the course posted to the web server.

Evaluation

Evaluation may be described as a process for determining whether or not learning experiences designed for students have been effective. (For an overview of cross-institutional perspectives on this issue, refer to the CUTSD project, *Learning-centred evaluation of computer-facilitated learning projects in higher education*, online at (http://www.tlc.murdoch.edu.au/project/cutsd01.html) Alternatively, evaluation may be seen as '…a very important element of ensuring effective teaching and learning' (Nicholls, 2002, p. 72). The method of gathering evaluative information depends on the element being evaluated, and in the case of electronic discussion groups, evaluation should take account of the wider learning context also.

Evaluation may be formal or informal, short-term, periodic, or based on longitudinal studies. One of the key issues to be clear about is what you are actually evaluating: the technology; the learning; other academic outcomes; skills; procedural knowledge: communication skills; attitudes? For examples of issues to consider, see http://www.umuc.edu/virtualteaching/module1/strategies.html where the University of Maryland University College provides examples from a range of disciplines.

Asynchronous discussion groups offer a wealth of retrievable material in the form of student/teacher conversations, but care should be taken in interpreting them in isolation, and without other data for comparison. In particular, if discussions form part of student assessment, comments may be constrained by that aspect, and not truly representative of student opinion. There is value in first operating discussions on a trial basis without assessment weighting for participation, to gain a better understanding of the issues important to participants. Interviews and questionnaires may help to clarify comments provided by students via the discussions groups while they are immersed in the course. It may also prove useful to precede such an information-gathering exercise with a self-evaluation for intending online students, to gain a better understanding of their attitudes, skills and readiness for learning in an online environment. This provides the opportunity to address access, skills, and resource issues prior to formal engagement in the course – useful for both staff and students. (See Illinois Online Network http://www.ion.illinois.edu/IONresources/onlineLearning/selfeval.html).

Hew and Cheung (2003) provide suggestions for evaluating learner-learner interaction, learner-teacher interaction as well as student thinking skills and information processing, plus roles played by online moderators. They provide a useful comparison of the strengths and weaknesses of seven evaluation models in their online article at http://www.ascilite.org.au/ajet/ajet19/res/hew.html .

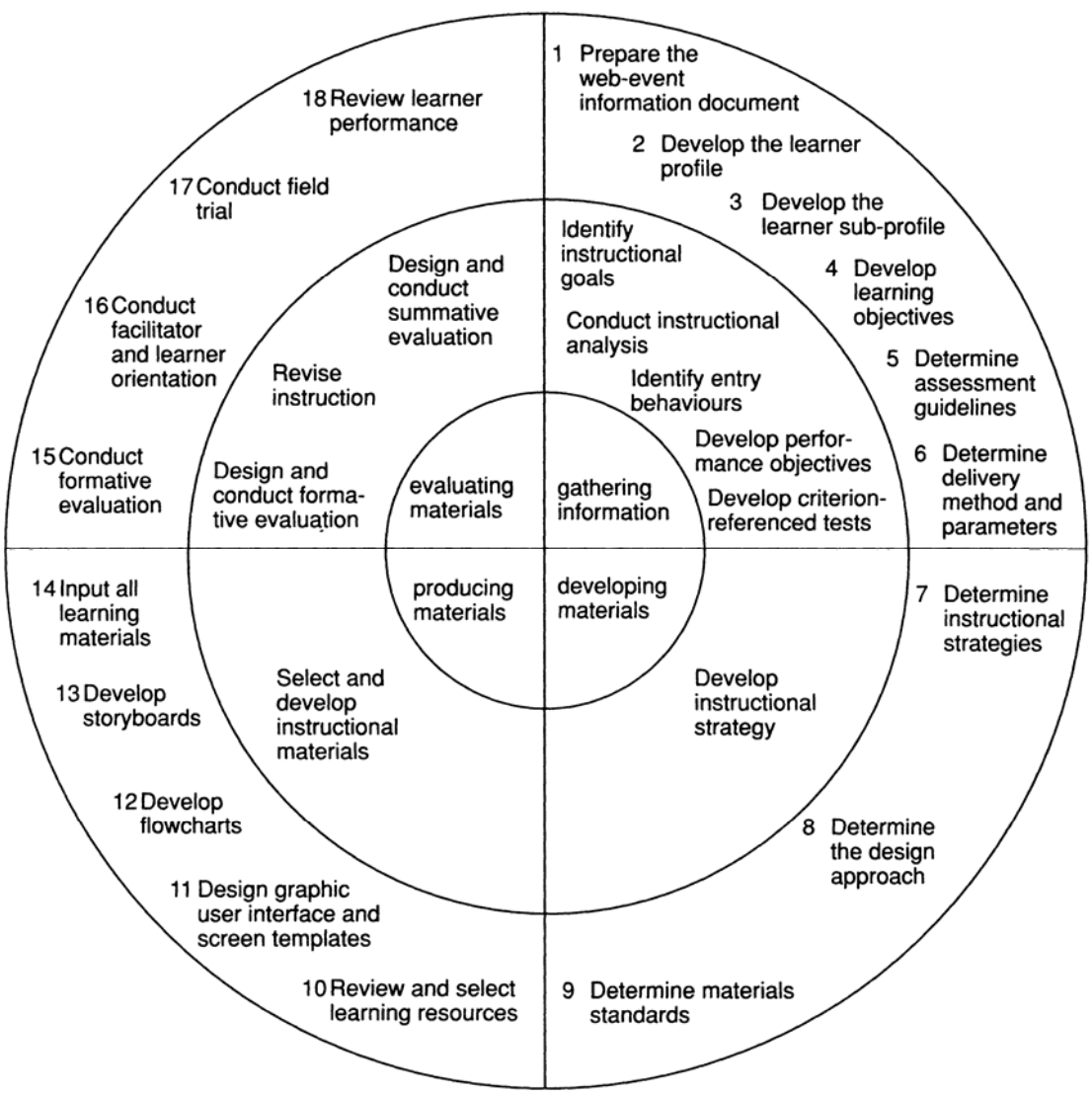
The type, timing and duration of evaluation should be considered in relation to what is being evaluated. This may be difficult to assess for first-time teachers/moderators, especially in constructivist learning environments, where potential for individual

learning outcomes may be greater than in more prescriptive contexts. The document, 'Staff development in evaluation of technology-based teaching development projects: An action inquiry approach', at http://cleo.murdoch.edu.au/projects/cutsd99 explores the dominant paradigms used in evaluation studies: Positivist-quantitative paradigm; constructivist-interpretive-qualitative paradigm; critical theory-postmodern paradigm; and the eclectic-mixed methods-pragmatic paradigm (Reeves, 1997).

Finally, Brookfield and Preskill (1999) in their book, *Discussion as a way of teaching*, provide valuable insights into evaluating elements of discussion, including issues relating to teachers who talk too little or too much, and students who talk too little or too much. They offer a range of suggestions for interpreting different patterns of communication, for establishing a productive balance within discussions, and for students to capture their learning responses e.g. via logs or portfolios. As student participation is assessable in some courses, the terms of that participation (or perhaps more appropriately, contribution to the course) should be carefully considered by academics planning and defining the assessment criteria. The authors offer a range of suggestions which focus on learning as the primary concept, and teaching as the secondary one, and give examples of different forms of participation which may contribute to learning. They caution that discussions are always contextual, and should thus be evaluated only from inside the group, working from students' own testimony. Brookfield and Preskill also state that appreciation is a major element in evaluation, allowing individuals the opportunity to acknowledge the contributions to their learning of others in the discussion group.

The Eighteen-Step Model for Building a Web-based Learning Event

The eighteen-step model was developed by Jolliffe, Ritter and Stevens (2001) and draws on the traditional ISD approach. They argue that the design and development of effective instruction revolves around four basic steps, gathering information, developing materials, producing materials and evaluating materials. They have expanded these four basic steps into an eighteen-step methodology for the design and development of web based materials. Some steps are specially related to web materials and the various steps can be adapted to suit the learning context. The model illustrates the expanded processes based on the four basic steps.



Source: Jolliffe, Ritter & Stevens, (2001), Eighteen steps for developing Web-based learning materials, Fig 5.3 p. 64

Discussion (issues/implications)

When choosing online discussion forums as a learning strategy, it is important that course leaders and tutors are skilled moderators of online interaction in order to achieve the planned outcomes. There are web sites and many publications available to provide resources. Alexander & Boud (2001, p. 9) argue that the learning that results from a computer conference depends much more on the skills of the moderator rather than, as is often implied, on the number of features present in the particular conferencing software tool in use (McDonald & Reushle, 2002). Salmon (2000, 2002) has also emphasised the critical role of the *e-moderator* in organising the conferences and in affording online socialisation and networking amongst conference participants, at the same time as they maintain their critical intellectual role. Salmon's E-tivities web site provides a framework for online active and interactive learning http://www.e-tivities.com/home.asp. Salmon uses a Five Stage Model to illustrate the different stages of development in online discussion forums:

- Stage 1 - access and motivation
- Stage 2 - socialisation
- Stage 3 - information exchange
- Stage 4 - knowledge construction
- Stage 5 - development

Berge and Collins host a web site "The moderators homepage", which links from their home page at www.emoderators.com. The site provides a wealth of information on

computer mediated communication (CMC), the role of the online facilitator, and netiquette, as well as providing a discussion forum for online moderators. Those new to teaching or moderating online discussions often benefit from first becoming student participants in other online groups, allowing them to better understand the issues from a student perspective.

Managing Online Groups

It is clear that with larger groups of students working with one teacher, different strategies are required to take advantage of the communication opportunities provided by the Internet. Student expectations need to be carefully managed and parameters defined at the beginning of each teaching period. Experience has shown that many students will not participate in online discussion unless there are grades awarded. Using grades to reward participation requires careful thought, as meaningless postings do not equate to quality learning outcomes. Clearly defined expectations in terms of levels of participation and assessment requirements are essential (McDonald & Reushle, 2002).

When managing online groups, the discipline area of the course, the student level (undergraduate/postgraduate) and teaching philosophy are important considerations. Beaudin's (1999) online paper, "Keeping online asynchronous discussions on topic" provides useful guidelines. The results of Beaudin's study showed that online instructors rated the following as the top four techniques for keeping asynchronous online discussion on topic:

- carefully design questions that specifically elicit on-topic discussion,
- provide guidelines to help online learners prepare on-topic responses,

- reword the original question when responses are going in the wrong direction, and
- provide discussion summaries on a regular basis.

Staff Support and Resources

. As the authors' university increases its offer of online courses it has recognised the need to assist university staff in the transition to the world of electronic teaching and learning. Several programs and resources have been developed to meet the needs of staff moving into the world of online teaching and learning (McDonald & Reushle, 2002).

They include:

- Workshops offered through Human Resources, the Distance and e-Learning Centre and Information Technology Services
- The Staff Development Gateway (http://www.usq.edu.au/StaffDevGateway/) which offers details of professional development opportunities for staff at USQ, and links to other online programs and resources, including those developed by other universities.
- An online education and training program for teachers. The program aims to provide learners (in this case, the academic staff) with first-hand experience of their roles and responsibilities as online teachers and administrators by immersing them in the teaching/learning environment. Each module of the course has sections on how to use the system, related theoretical underpinnings, and recommended resources, and is supported by introductory face-to-face sessions. The course addresses

administering, communicating and assessing in an online environment. It also provides pedagogical exemplars across all discipline areas. This site undergoes cyclical evaluation and revision.

- Staff development papers, available both electronically and in print copy. The papers elaborate on concepts introduced in face-to-face sessions and within the electronic sites (such as, “Using Discussion Forums Effectively”).

Conclusion

In any education context, learning and teaching are inevitably shaped at the micro level by the contributions of students and teachers. At other levels, they are shaped by the overarching issues such as policies, resources and management decisions, as well as changes in politics and expectations by changing societies.

The challenge therefore is for educators to make best use of opportunities to apply to course design and teaching, pedagogical approaches informed by contemporary research which takes account not only of definable learning outcomes from online discussions, but also allows for those unanticipated outcomes which help sustain interest and motivation for all participants.

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