

BUILDING LEARNING COMMUNITIES THROUGH TECHNOLOGY

Rozz Albon and Sue Trinidad
Curtin University of Technology

ABSTRACT

This paper describes an alternative approach to teaching and learning in the Faculty of Education, Curtin University of Technology. Universities are currently grappling with a shift in paradigms, from a traditional approach which considers learning and proof of learning residing with a single person, to, as yet, an undefined model which embraces the continuing interaction of minds from within a wide social fabric i.e., learning communities. Through a three year project the authors were able to reconceptualise and operationalise teaching and learning through two key components, one being technology which has been the force behind the building of the learning community and the other being assessment which is learner-focused. The authors have developed a Learner Mediated Approach (LMA) based on the nature of learning communities in which multiple approaches to learning reflect the learning process. This approach encapsulates a learning community in which the technology drives the model, and the assessment drives the learning.

INTRODUCTION

Today's work environment requires people who can think critically and strategically to solve problems in diverse situations. Universities are now responsible for producing graduates with these attributes (Curtin University of Technology, 2000). The formulation of attributes acknowledges universities' roles in better preparing graduates for productive employment in a technologically advanced and rapidly changing world.

In an advanced information age it is not surprising to find that technology has revolutionised learning. Interactive technologies have become important instruments in learning as today's students are learning *with* technology, as opposed to learning *about* technology (Trinidad, Macnish, Aldridge, Fraser & Wood, 2001). Technologies provide a powerful vehicle for extending student capabilities and offer an active, social context for supporting learning not before possible (James & Beattie, 1997). In addition, students can access and build knowledge from numerous sources and multiple perspectives.

Learning within universities is being reconceptualised to embrace the potential of interactive technologies. World-wide networks allow students and educators to use electronic communications more easily – with the Internet and e-mail supporting a 'social interaction model' of teaching and learning. Students are able to connect online to other learners, educators, community members, and experts around the world in order to develop authentic

collaborative projects. Interactive technologies make it easier to create andragogically-sound environments (Albon & Trinidad, 2001) which in turn address motivation, flexibility and – ultimately – achievement, competence, and personal growth.

Although educators have been teaching with electronic environments (e-learning) since the mid-nineties, current direction appears to be clarifying and defining what constitutes 'real learning' in such environments. As noted by Deryn Watson, editor of the journal *Education and Information Technologies* (2001), we are beginning to "disentangle the hype and begin[ning] to explore the web-based terrain to greater depth" (p.79). This paper reports on a small exploration of that terrain. Constructs for an alternative approach to learning which better meet the demands imposed by changing times are proposed. The terrain articulates an approach to learning mediated by technologies to build learning communities in our university's Faculty of Education.

BACKGROUND AND THEORETICAL FRAMEWORK

University students are adults, therefore andragogical approaches to learning should be implemented within universities (Albon & Trinidad, 2001). Regardless of whether these learning environments are taught through paper-based, face-to-face, online, or a mixture of delivery modes, Burns (1978) and Knowles (1998) advocate that the following characteristics are necessary to learning environments which involve adults as learners:

1. letting learners know why something is important to learn; they must value the learning,
2. mutuality of responsibility in defining goals, planning, and conducting activities that are based on the real needs of the participants, that is, showing learners how to direct themselves through information (self-direction),
3. relating the topic to the learner's experiences and using this experience as a springboard for developing objectivity,
4. motivating people, as they will not learn until they are ready and motivated. often this requires helping them overcome inhibitions, behaviours, and beliefs about learning; it requires a worth for the individual and their self-concept,
5. an open, democratic environment where individual differences in style, time, place, and pace of learning are integrated into the learning experience.

Many theories of learning have been developed to explain how learning is internalised (Woolfolk, 2000). Despite this knowledge, some university teachers do not always understand learning, and the real issue of *how* learning occurs is often overlooked. These teachers may be competent in analysing what the teacher will do and what the student will do but, unfortunately, are not always competent in knowing how a student actually learns. This emphasis on learning, as opposed to teaching, is intentional because once the process of learning is understood from its many perspectives, the critical selection of strategies to ensure that learning takes place should follow. We suggest every educator in any discipline, whether this be computing, engineering or accounting for example, ask themselves a fundamental question: how does learning occur? The answer informs the learning process and strategy selection irrespective of whether the environments are paper-based, face-to-face, online, or a mixture of delivery modes. A unit has been presented in an analytical form later in this paper to illustrate the application of several learning theories.

Teacher-centred, *student-centred*, *learner-centred* and *outcomes-based education*, are terms used to compare broad philosophical approaches to learning. In this paper, *teacher-centred* refers to traditional and authoritarian instruction in which the teacher directs all learning. *Student-centred* acknowledges the learner's participation in the learning

experience, and *learner-centred*, following the philosophy espoused by John Dewey in 1910 (Woolfolk, 2000), refers to strategies which put the learner in control of constructing their own learning. A learner-centred approach acknowledges the roles of pace, repetition, learning styles, motivation, self-regulation, and responsibility to learn. Assessment in a learner-centred approach is considered an aspect of learning. This is in contrast to the teacher-directed, traditional approach in which assessment may not be central to the learning. In an *outcomes* approach to education there is a shift from teaching to learning where the teacher needs to take responsibility for ensuring that all students learn – and make progress. Implicit in an outcomes approach is student-centredness. A student-centred approach requires a shift from the teacher as director of learning to facilitator of the learner's direction and creator of learning opportunities.

A paradigm shift in the Faculty of Education at Curtin University of Technology

Up until 1999, the teaching and learning within the Faculty could generally be described as a teacher-centred approach in which lectures, essays, and presentations were dominant. The impetus for change came with a Curtin University of Technology project to implement a student-centred and outcomes-based approach to teaching and learning within the Faculty. A small group of lecturers within the Faculty, including the authors of this paper, volunteered to be involved in the three year project, two years of which were dedicated to trialling student-centred, outcome-based units. This group saw the project as an opportunity to rejuvenate the educational focus of academic staff within a Faculty that, as a whole, did not embody a culture of learning that new times were demanding (Shortland-Jones, Alderson, & Baker, 2001).

Emerging from this project was the need to clarify what constituted 'real learning' within individual units (e.g., Mathematics Education, Educational Psychology, Technology in Education). To facilitate this, an analysis of the traditional learning approach (Figure 1) and its limitations to learning was made by the authors, and the Learner Mediated Approach (LMA) (Figure 2) evolved as a result of this analysis (Albon, 2001; Albon & Trinidad, 2001).

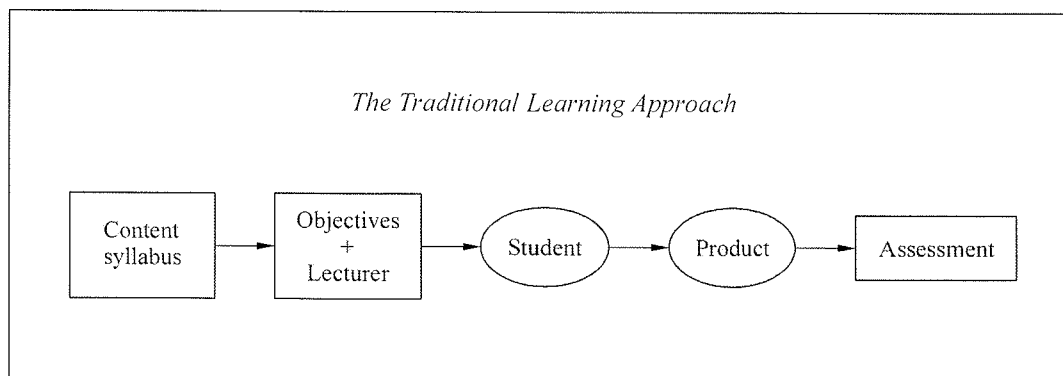


Figure 1: The Traditional Learning Approach.

In a traditional approach (Figure 1) content (or a syllabus) is firstly designed to address the question of what it is that students should learn. The lecturer is seen as the expert with a specific knowledge base, and the student is seen as a passive receptor of that knowledge. Secondly, the lecturer sets the objectives for what is to be learnt. The lecturer, as knower of truth and information, espouses this to students, thus demonstrating the transmissive mode of delivery (Barnes, 1987). Students receive the information, and through the 'product', produce evidence of learning, usually in the form of something static such as a test or essay. Not only does this model promote a 'surface' learning approach which is incompatible with today's need to produce workers who can think critically and strategically to solve problems in diverse situations of a rapidly changing world, it is not based on a clearly articulated theory of learning.

The Faculty's move away from a traditional learning approach is consistent with comments from critics. "There is strong evidence that traditional models of learning...don't work" (NCREL, 2001). This approach appears irrelevant to student learning needs in a rapidly changing environment. In addition, traditional learning, as well as being highly sequential, has been discrete, low-level, and skill orientated in both content and assessment.

New times demand new ways of learning (NCREL, 2001) and technology empowers new solutions. Researchers and educationalists in their attempts to develop learning in the as yet uncharted terrain of e-learning environments are revisiting learning theories (Radloff & de la Harpe, 2001; Topper, 1995). An elevation of the importance of quality teaching and learning in higher education, such as that occurring at Curtin University of Technology, exemplifies the need for engaged, meaningful, collaborative learning involving challenging and real-life

tasks. As the Curriculum Council's (1999) *Post Compulsory Education Review Discussion Paper* states:

"Citizens of the twenty-first century will require knowledge and skills that enable them to be creative and enterprising. Initiative, risk-taking, lateral thinking and resourcefulness will be vital to success. People will need to be flexible and adaptive in a society that is changing economically and socially. They will need to be technologically competent, capable of using the opportunities of the digital world and self-managing of careers that may change many times. As life-long learners, they will need to continue to access education and training" (p.1).

A new solution has been forged where working and learning move together.

A MODEL EMBRACING THE LEARNING COMMUNITY

Technology has indeed empowered the authors with new solutions to the problems often associated with learning. Considered in these solutions are a number of factors, including the nature of teaching, student approaches to learning, the use of technology, and access to information and resources. In addition, past methods cannot be relied on to assess learning as they are incongruent with current learning processes. Future methods should assess the effectiveness of learning environments and learning opportunities, including e-learning, to produce graduates with the necessary attributes for workplace employment.

In the Mediated Learning Approach (MLA, Figure 2), lecturers still bring their expertise, still have a syllabus or content, and still have objectives, but the major change is the recognition of learning through technology and mediation. The learning is learner-focused which recognises that the adult brings prior knowledge, attitudes, skills, and a variety of

approaches to their own learning. Outcomes/attributes provide the vision of what the learner should achieve, that of thinking critically, analysing information, and problem solving. The student is seen as one who is actively and meaningfully engaged in their own learning, which is embedded in a socially interactive environment.

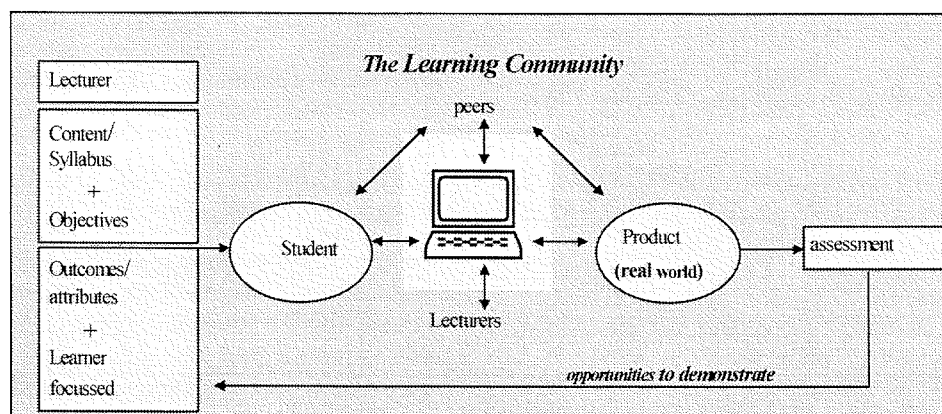
The MLA centres on technology, which *drives* the model. In the model, technology is the vehicle for communication and collaboration, and the framework for mediated learning that takes place between lecturers, peers, and the wider community to produce authentic tasks, projects, or investigations. Interactive technologies provide an opportunity for new and self-sustaining communities of learners, large and small, formal and informal, to exist alongside established, traditional approaches. Bransford, Brown, & Cocking (1999) state: "the new technologies provide opportunities for creating learning environments that extend the possibilities of 'old – but still useful – technologies – books, blackboards, and linear, one-way communications media, such as radio and television shows – as well as offering new possibilities' [online]. Interactive technologies allow the lecturer to build a learning community that transcends the four walls of the classroom but is not restricted by traditional class timeframes. Social constructivist theory is applied to the MLA allowing students to increase the opportunities to learn from each other. Further, in producing teachers who are competent communicators, educators have little recourse but to provide learning experiences in

all forms of communication, both online and face-to-face. In this way technology drives a model of adult learning that reflects the criteria identified by Burns (1995) and Knowles (1998).

However, in the MLA the effectiveness of learning is driven by the nature of the assessment and not by technology alone. As in the traditional learning approach, assessment is an integral component, but the purpose has now changed. Assessment is part of the learning process in which challenge, decisions, and reflections are experienced through the development of a real world product. Learning is more than knowing content. It is about developing competency in applying knowledge. In this way assessment *drives* the learning. This means assessment is no longer a vehicle for students proving what they know, but instead is open-ended, negotiable, educative, explicit, and informative. In this performance-based assessment students are involved in weaving the content of the unit to produce the product using group work over a period of time. Processes include peer-reviewed forms of presentations, reflections, student quiz construction, interviewing, interpreting, and applying research findings. Such performance-based assessment is generative in that it allows students to construct their knowledge, to produce real world products and services, perform in some way, organize conferences, create artistic works and so on. Assessment is seamless and ongoing in a community of learners, as is the feedback to students. These critical elements in the MLA, are linked to the content/syllabus as shown in Figure 2.

The Mediated Learning Approach

Technology drives the model, assessment drives the learning



©Albon & Trinidad, 2001

Figure 2: The Mediated Learning Approach (MLA).

THE MLA AND BUILDING A LEARNING COMMUNITY

The MLA works on building a learning community between educator, student, and peers as all work together for a common cause. The MLA was based on Feuerstein's (2001) original mediated learning experience, and adapted from its application by Albon (2001), in which a special type of interaction between a learner, the educator, and peers (mediators) occurs. Within the MLA, the lecturer and peers interact with the learner in ways to mediate the process of developing a high-quality and well-understood response. An analogy can be drawn with that of coaching an athlete to perform his or her best at the Olympics. Frequent, timely, quality, and meaningful feedback enables the learner to move forward with competence and reduced anxieties. The MLA transforms the role of the lecturer and peers, thus creating a paradigm shift. For the MLA to be an effective teaching approach, it, like learning, must be positioned within a constructivist philosophy, some of which may be accommodated within an educator or facilitator framework (Albon, 2001). Adopting constructivism as a single approach to constructing appropriate learning opportunities is limited but, when combined with mediation, a powerful and appropriate approach to adult learning is possible. In sum, meaningful and deep learning is better accommodated through the MLA, which truly embraces the many views of learning and includes the learning community. Students have embraced the MLA as evident in their feedback:

Assessment driving the learning:

"I could hardly believe I was learning, this has been so much fun. This assessment has really stretched me. I have never had to work at this level before and its doing me good. Its been hard going but I have learned so much from this-like how to deal with dominant group members, time management. Working with others who learn in a different way to me has taught me a lot about the learning approaches we have and how I must consider these. I thought I was a leader but now know I am not as you have to listen to everyone else's input and work toward".

"Designing the quiz was a good way to learn because it forced me to pick out the most important aspects and to try and put these into questions. I learn best through questioning myself, and others, and I found this part of the assignment challenging. I found that with most assignments that I do in other subjects, it is very hard to focus on the task for very long. If we

had a discussion about it this wouldn't be a problem but to have to try to put it into writing bores me stupid. I inevitably end up just writing anything merely to complete the assignment. For this reason I found that I learnt much more through this form of assessment where the topic was discussed and revisited over and over again in many different ways."

Technology driving the model:

"I never found it boring or hard to concentrate. There were times when we spent hours on end in the computer lab without realising how long we had been there. As an added bonus I learnt a lot about computers and the possibilities of technology. Previous to this I could turn a computer on and type an assignment but this was about the limit."

"Never before have I spend so much time on the Internet looking up journals and other interesting facts to link to our focus area. I found myself completely indulging in this at times and other times not looking at it for days. I guess this is one example of motivation."

ILLUSTRATING THE MLA AND ITS PROCESS THROUGH A FIRST YEAR UNIT EXAMPLE

To illustrate the MLA, the first year unit about *Teaching, Learning and Assessing* (the source of the above student feedback) is used to show the tasks and the role of technology and the student's processes in the construction of knowledge (Table 1). Column one lists the assessment component tasks of the website. The second column explains what was required of the students. The third column lists the technology used for each of the assessment component tasks and the final column briefly describes the mediation in each of the tasks.

Students, in groups of four, were required to develop a website comprising several component tasks as well as a reference list and bibliography. Groups were encouraged to function as communities of learners in order to access information and to build each member's personal capacity.

WebCT was used as the online structural environment. Its e-mail and bulletin board facility were used extensively to create and maintain the e-learning environment and the community of learners. Cognitive, social and behaviourist learning theories, with emphasis on motivation, metacognition, self-regulation, and esteem needs played a significant role in the development of the MLA.

Assessment Component Tasks of Website	Requirements	Technology	Mediation: Community of Learners & Related Theories
Journal of Andragogy (an authentic document: articles, processes, meetings, drawings, web storyboards, communications, personal evaluations, comments, transcripts) Submitted at the completion of the web site development.	Students were to meet in groups of 4 during a one hour timetabled computer lab as well as group negotiated times. They were to maintain a record of all meetings including the agendas & weekly goals. The scribe was to be rotated.	Online journals E-mail communications Meeting proforma and minute records	The lecturer was to be invited to group meetings. Requests were made via WebCT, personal invitation, phone, letters/notes. Inclusion in group meetings served the purpose of debate, explanation, application, interpretation of journal articles, clarification and discussion and review of work completed. Students were encouraged to access experts and others in the university and wider community.
Chapter Summary (The selected area of study)	This task was to be presented in an easily read format which did not duplicate the text summary. Its purpose was to provide foundational knowledge.	Website Wordprocessing E-mail	Students were encouraged to review each other's contribution in order to obtain excellence in grammar, clarity & cohesion. Powerpoint, Word & graphics were used to present the summary. E-mail was used to send drafts to each other.
Quiz (Style & length was left open)	Each group constructed a quiz which was to be scholarly & entertaining. Each individual had to complete four quizzes. Marks contributed to the final grade.	Website WebCT – bulletin board, e-mail Wordprocessing	Students constructed multiple choice, close passages, short answers, mix and match, true/false, and crosswords and trialed each section. The lecturer could be asked to appraise these in conjunction with student comments. WebCT was used to advertise the availability of each quiz. Quizzes & their results were e-mailed to the lecturer.
Teacher Interview (Minimum of one teacher)	A teacher was to be interviewed about the focus area. The interview was to provide insight into how theory was applied in real life settings. An analysis & synthesis of the transcript and its relevance for beginning teachers was to be placed on each group's website.	Website Wordprocessing WebCT– bulletin board, e-mail	Many groups selected 2-4 teachers. Transcripts were interpreted and synthesised. WebCT, e-mail and input from the lecturer contributed to the final set of questions and synthesis. Students were given feedback as to the usefulness of the questions and the informativeness of the anticipated responses.
Video	A selected video was to be briefly summarised & important points highlighted to explain the theory underpinning it.	Website Wordprocessing e-mail	If students understood the theory of their selected focus area, they were in an informed position to identify the theoretical underpinnings in a video. Selection could range from a documentary, professional teaching package or a child's story
Journal Articles (Appraise three)	From an examination of journals, three were to be selected to indicate their application to teaching and learning.	Search of data bases in library Full text citations Website Wordprocessing e-mail	Students were encouraged to select 3 articles (on-line or hard copies) from a wide review. The appraisal had to identify a contribution to their learning. Students were to ask for assistance from others in the community for their interpretation.
Internet articles/sites (Minimum of one)	From an examination of sites the selection and brief comment of one was to be made on the website. It had to relate to the selected focus area.	Internet e-mail Website Wordprocessing	Students volunteered to select several sites. Access to the wider world was encouraged.
Links to other unit topics (Two links to other chapters in the text)	The unit outline was to be used to help select two other topics to which the focus area could be related. The relationship was to be made clear.	Wordprocessing e-mail	Understanding teaching and learning is enhanced when connections are made to the discretely studied topics. Explanations of these links were to be made explicit on the website.
Critique of peer websites	Each group critiqued two other websites and allocated marks according to a student developed criteria.	WebCT – bulletin board, e-mail	Lecturer could be asked for feedback on the informational aspect. WebCT was used to collate and access all sites. Students had the choice of marking online or offline. Criteria were sent as an attachment to a bulletin board message. Students developed the criteria during tuteshops.

Table 1: Assessment tasks, role of technology and student processes in constructing knowledge.

Refining the MLA process

Several units have been designed using the MLA. These units have been trialed over two years, with two cycles of approximately 180 students per year. A number of adjustments have been made over the two years, subsequently 'ironing out the bugs'. For example, in the first year unit; Teaching, Learning and Assessing, it was found valuable to introduce WebCT earlier in the student's program and to use a developmental framework. Student feedback was collected in the form of written and verbal anecdotal responses and then analysed. Based on the feedback, changes were made to the assessment tasks, such as adjusting group size (from 5 to 4), re-examining elements of assessment such as the content and structure of the journals of andragogy, and redefining the purpose of teacher interviews (producing transcripts versus synthesis of data).

CONCLUSIONS

This paper introduces the Mediated Learning Approach (MLA) and its application in the Faculty of Education at Curtin University of Technology over the last three years. In this approach, the assessment drives the learning and the technology drives the model, creating a simultaneous and harmonious building of a learning community. Assessment is designed to provide opportunities for students to demonstrate their achievement of the outcomes through a learner-focused approach. Assessment tasks, which emphasise planning, writing, and revising ideas mediated through the learning community, and encourage deep meaningful learning, are pivotal to the approach. The MLA as a model has the potential to move staff from a traditional approach of teaching and learning to one diverse enough for an ever-changing world. Through integrating technologies, and building and using communities of learners, the authors have created a solution that caters for students of the information age.

REFERENCES

- Albon, R. (2001, December). *Mediated learning in a university environment*. Paper presented at Australian Association for Research in Education AARE2001 Conference, Notre Dame University, Fremantle.
- Albon, R., & Trinidad, S. (2001). Tapping out new rhythms in the journey of learning. In A. Herrmann and M. M. Kulski (Eds.), *Expanding Horizons in Teaching and Learning* [Electronic version]. Proceedings of the 10th Annual Teaching Learning Forum, 7 – 9 February, Curtin University of Technology, Perth. Retrieved January 10, 2002 from <http://cleo.murdoch.edu.au/conf/tl/2001/trinidad.html>
- Barnes, D. (1987). *From communication to curriculum*. United Kingdom: Hazel Watson & Viney.
- Burns, R. (1995). *The adult learner at work*. Sydney: Business and Professional Publishing.
- Bransford, J., Brown, A., & Cocking, R. (1999). Technology to support learning. How people learn: Brain, mind, experience and school. National Research Council. Retrieved January 10, 2002 from <http://books.nap.edu/html/howpeople1/ch9.html>
- Curriculum Council. (1999). *Post Compulsory Education Review: Discussion Paper*. Perth: Curriculum Council, WA.
- Curtin University of Technology. (2000). *Curtin University of Technology Strategic Plan 2000 - 2005*. Retrieved from <http://www.curtin.edu.au/curtin/dept/planstats/plan/>
- James, R., & Beattie, K. (1997). Postgraduate coursework beyond the classroom: Issues in implementing flexible delivery. *Distance Education*, 17, (2), 355-368.
- Knowles, M. (1998). *The adult learner. The Definitive Classic in Adult Education and Human Resource Development*. Houston, TX: Gulf Publishing.
- NCREL (North Central Regional Educational Laboratory). (2001). *New times demand new ways of learning*. Retrieved January 10, 2002 from <http://www.ncrel.org/sdrs/edtalk/newtimes.htm>
- Radloff, A., & de la Harpe, B. (2001). Expanding what and how we assess: Going beyond the content. . In M. M. Kulski and A. Herrmann (Eds.), *New Horizons in University Teaching and Learning: Responding to Change*. Proceedings of the 10th Annual Teaching Learning Forum, 7 – 9 February. Perth: Curtin University of Technology.
- Rogers, E. (1995). *Diffusion of Innovations* (4th ed.). The Free Press: USA.
- Shortland-Jones, B., Alderson, A., & Baker, R. (2001). Leadership for Cultural Change: Developing a Community of Learners in Teacher Education. In *International Electronic Journal for Leadership in Learning*, 5 (1). Retrieved January 10, 2002 from the World Wide Web <http://www.acs.ucalgary.ca/~iejll/>
- Trinidad, S., Macnish, J., Aldridge, J., Fraser, B., & Wood, D. (2001). *Integrating ICT into the learning environment at Sevenoaks Senior College: How teachers and students use educational technology in teaching and learning*. Paper presented at Australian Association for Research in Education AARE2001 Conference, December 2–5, Notre Dame University, Fremantle.
- Watson, D. (2001). Editorial. *Education and Information Technologies*, 6 (2), 79.
- Woolfolk, A. (2000). *Educational psychology* (8th ed.). Sydney: Allyn and Bacon.