A TEACHING PROGRAM IN RURAL EDUCATION: LEARNING THROUGH EXPERIENTIAL ACTIVITIES

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ABSTRACT

This paper describes an innovative rural education project undertaken at Edith Cowan University through funding from the Committee for the Advancement of University Teaching (CAUT). The project sought to create and implement an instructional course based on contemporary learning theories and to enhance learning outcomes in a pre-service teacher education course dealing with rural education. It sought to do so through the use of telematics in teaching and learning. The project involved the development of a module of work that enabled students to experience the technology and to construct their own perceptions of the use of telecommunications as a delivery medium for rural education. It was planned that the students would learn about teaching and learning with telematics by themselves being taught with that technology. The outcomes and initial findings from an implementation of these ideas provided very positive results. The project has demonstrated a powerful alternative to the conventional teaching format, one which is both efficient as a delivery medium and effective in the outcomes that are achieved.

INTRODUCTION

One of the most consistent themes evident in the literature dealing with rural education is that of rural disadvantage. Of the matrix of factors leading to that disadvantage, geographical isolation and the extent to which it restricts access, is a major concern. If access is a matter of fairness and equity, it is fair and equitable that all children, regardless of location, have access to the broadest range of quality educational experience. Many rural children, however, are denied that access.

Traditional educational delivery systems will not suffice. Telecommunication technology offers great promise and, in some cases, provides the only viable means of providing access to the educational services required. Furthermore, there is clear evidence that the very best level of service can be brought to all rural schools regardless of size or geographical location or the specificity of the requirement.

Teacher education institutions have a role to play in this process. They are aware that the majority of their graduates will be appointed to rural schools or will be transferred to such schools early in their careers. They are aware also that a significant and increasing number of rural schools utilise telecommunication technology in their instructional program. Accordingly, as noted by Tomlinson (1994), their role is essential in ensuring that the promise and potential of instructional technology is fully realised.

The project described in this paper, was designed to develop a curriculum to instruct teacher-education students more effectively in the use of telecommunications technologies and teaching and learning in rural settings. In past years the rural education course at Edith Cowan University has used conventional teaching methods in its program delivery. Students were exposed to the procedures and practices within rural education settings through such activities as formal lectures, site visits, observation of classroom activities as well as reading and reviewing relevant literature. This form of delivery provided the students with a broad view of the nature of teaching and learning in rural education and with elementary practical classroom skills. The

knowledge and skills, however, ran the risk of being general and peripheral to actual applications, a factor that has been found to limit the development of a full understanding of the technology and its applications (Robinson, 1993; Downes, 1993; Byrum & Cashman, 1993).

Theoretical Framework

The design of the curriculum developed in this project was based on contemporary learning theories that espoused the value of knowledge construction and contextual learning rather than knowledge transmission. The relationship between teaching and learning was based very much on the types and levels of activity engendered in the learners. Cognitive psychologists have promoted the notion that learners receive knowledge from environmental stimuli and that learning depends on how that knowledge is used. Piaget (1954) argued that information is coded and learned according to the meaning ascribed by the learner. Bruner (1960) showed that developing and establishing relationships between items of knowledge is critical to learning. He used the term 'meaningful learning' to describe that which accompanied the construction of links to existing knowledge. Ausubel (1960) went further to describe the need for instruction to build networks and frameworks into which new knowledge could be placed with meaningful links and connections.

The view is also promoted by some educators that learning is enhanced by active environments in which students have cause to be engaged and reflective in the learning process. Similarly, there is support the notion that students learn through a process of constructing knowledge. This constructivist view maintains that knowledge is gained by learners through a process of knowledge building. When a learner is confronted with new knowledge, the learner 's intentions, previous experiences and metacognitive strategies are all essential elements in determining what becomes of the knowledge. In this process, the learner is regarded not as an empty vessel into which knowledge is poured, but more as an individual replete with pre-existing knowledge, aptitudes and motivations (Reeves, 1993).

The project sought to create a curriculum that would support a constructivist learning environment. Students were to become active learners who would process lesson content through generative activities. Wittrock (1974) describes generative processing as deep processing that emerges from activities that cause students to interpret and assimilate new information into existing mental structures and to reorganise existing structures in the light of newly interpreted information.

The project further sought to create an environment that facilitated high levels of learner control. Learner control has been a heavily researched dimension of learning environments in recent years (Steinberg, 1989). In rural settings, both students and teachers are often required to assume control and take responsibility of their own learning programs. New teachers in rural schools need to have the skills and confidence to seek information from their own resources. They need to be able to create and support learning environments that use and build on the students' capacities for self-regulation. These forms of teaching and learning are quite foreign to many student-teachers. Through their own schooling and tertiary studies they are likely to have met only conventional forms of instruction. Traditionally the role of the teacher in such environments is didactic and transmissive. But in settings where the teacher assumes more a facilitative and coaching role, students become more active in the learning process. Rather than attending to a teacher-student dialogue, students can be working in a more autonomous role, either individually or among themselves. When teachers facilitate learning, the level of student control is raised.

Student control and personal autonomy in their learning was also seen to enhance knowledge development and enable them to experience, first-hand, the learning environments to which their own students would be exposed. This, in turn, was seen as a means of developing a realistic set of expectations and impressions of the instructional settings which they would be required to develop and create in their future classrooms.

Perhaps the aspect of the project with the strongest potential for enhanced learning outcomes was its practical context. There is significant support in the literature for the benefits of contextual learning where students are taught and learn in environments that closely match reality. The earliest type of systematic learning activity probably involved some sort of apprenticeship whereby a novice worked side by side with a master. Apprenticeships have high concrete and experiential value. More abstract learning activities, such as classroom lectures, were developed much later in history. A major criticism of much of the current dominant pedagogical schemes is that they are too abstract, removed as they are from 'real world' experience (Brown, Collins, & Duguid, 1989).

An important concern for educators and trainers alike is the degree to which classroom learning transfers to external situations in which the application of knowledge, skills, and attitudes is appropriate. The cognitive theories of Newell and Simon (1972), Brown (1985), and others support the fundamental principle that the way in which knowledge, skills, and attitudes are initially learned plays an important role in the degree to which these abilities can be used in other contexts. To put it simply, if knowledge, skills, and attitudes are learned in a context of use, they will be used in that and similar contexts.

TELEMATICS

To provide students with a learning environment that involved all the elements of constructive learning, it was proposed to integrate the content of the teaching and the delivery medium. A course was proposed that incorporated a medium that had particular application to rural education, telematics, to teach about rural education. Telematics is the technology that enables simultaneous interactive communication between teacher and students using telecommunications (Oliver & Reeves, 1994). It is used widely in some Australian states for the delivery of educational programs to rural schools. The application of this technology is seen to provide a learning environment that is meaningful and effective (Haywood & Norman, 1988; Diem, 1989: Novak & Knowles, 1991). The full range of issues and subject content relating to rural education could be treated in a manner that was likely to increase the likelihood of transfer and generalisibility of the skills and knowledge (Brown, 1985) .

THE TELEMATICS COURSE

A curriculum was developed to expose the students to the advantages, difficulties and disadvantages associated with teaching and learning with telematics this medium. The curriculum was developed around a series of modules with support materials for independent student use. It was planned to be implemented in a virtual classroom among groups of students using telematics in two locations across campuses. The students would receive instruction and direction through attendance in telematics lessons and would then independently complete a series of prescribed tasks and activities.

Through this form of delivery, it was intended that students would learn:

- how to operate and apply the hardware associated with telecommunications, the mechanisms and processes by which the telecommunications technology operated,
- the skills required to independently use computers, telecommunications and the appropriate software,
- the instructional skills and relevant pedagogy associated with teaching and learning with telecommunications in rural schools, and

- through the integrated nature of the instruction, develop transferable and generalisable skills and knowledge applicable in future settings (Hollingsworth, 1989; Prawat, 1992; Rovegno, 1993).

COURSE MATERIALS

A range of learning materials was developed to form the basis of the independent student activity. While it was planned that students would attend the telematics sessions to establish a learning program, the bulk of the learning was to be undertaken independently and collaboratively in the students' own time. The materials developed were as follows:

a course guide, a booklet detailing the course, the modules and instructional episodes and the activities and tasks to be completed,
a set of readings, relevant materials describing the technology, its application and implementations,
video materials showing telematics teaching and learning,
instruction manuals and guides for the telematics equipment and resources,
a CD-ROM with appropriate materials to guide the planning and creation of telematics lessons,
instruction manuals and activities for the Macintosh computer system,
self-paced laboratory activities describing the use of the telematics software, and
an electronic document on the World Wide Web describing distance and rural education technologies and their applications.

The selection of the materials involved the broadest possible range of instructional technologies and media to provide students with exposure and experience in use of the many forms of technology that could support them in their rural education teaching.

COURSE DELIVERY

This course, delivered to students in 1995, was based on a series of short telematics lessons supported by independent learning activities. The telematics lessons were delivered by the lecturer from a separate campus. Another lecturer acted as a support for the students in much the same way as the classroom teacher coordinates school-based telematics programs. Students were expected to complete all the assigned tasks across a five week period leading to the final planning and delivery of an actual telematics lesson.

Throughout the course, communication with the support lecturer was limited to the telematics technology and telephone, a restriction that was used to make students fully aware of the conditions and limitations of learning through such technologies. Records were kept of the students' progress in the different activities and, three months after the course, they were asked to complete a questionnaire to gather more specific details of their attitudes to telematics teaching and learning. The questionnaire sought responses to the following questions:

What did students perceive to be the strengths of the course?
What were the perceived weaknesses?
How did the course compare to conventional teaching formats?
How much was learned and retained?
What parts of the course were the most effective and provided the best learning opportunities?

OUTCOMES

Student responses provided strong support for the claim that the course was both effective and efficient in achieving its objectives. Of the 23 students who participated in the project, most had minimal computing experience. That experience ranged from very limited use of computer-assisted learning packages to having used a word processor for assignment preparation. The technology emphasis in this course required students to significantly extend their practical computing skills and knowledge.

Course Strengths: The aspect of the course that most students regarded as its major strength was its practical and hands-on format. Most students commented on the value they saw being gained from the practical activities. Other strengths included the collaborative nature of the learning environment, the capacity to work in groups and the high levels of participation. The students enjoyed working with the technology and felt that the independent nature of the learning led to confidence building in the use of the various pieces of hardware and software. It was of interest to note that many of the attributes of distance learning that often are seen as impediments to successful teaching and learning, for example, independent learning, were seen by these students to be a strength of the course.

Course Weaknesses: Students noted a number of weaknesses in the way in which the course was delivered. Those weaknesses were all brought about by the remote learning environment and the incapacity of the technology to fully replicate face-to-face teaching. In a more traditional course students would have been told of the weaknesses of teaching with telematics. In this course, however, they experienced those weaknesses. The students indicated that they would have preferred to have met the off-site instructor. They felt that this limited the knowledge they could draw from his experience. It could be argued, however, that the knowledge they drew from being distant probably significantly outweighed the benefits that which would have been gained from direct contact. The students further felt that the course itself was of too short a duration and would have preferred more time to work with the technology and prepare their teaching sequences. This can be quite easily remedied in future implementations by breaking this component of the course into non-contiguous blocks.

Comparison With Conventional Instruction: All students saw strong comparisons between the new format and conventional modes of teaching. Students were asked to comment on what aspects they saw as superior and inferior. There were many more examples of superiority given. The more frequently mentioned superior elements tended to be those associated with active and constructive learning. The students recognised and valued the approach that placed importance on learning through experience. Those aspects listed as inferior tended to relate to restrictions caused by teaching with telematics and as such were strong and contributory components of the teaching program.

Learning: The students were very positive in their descriptions of what they learned and retained. The questionnaire, completed some time after the end of the course, provided some time for the course content to wane. The majority of students considered that they retained a strong level of knowledge of the principles and practices covered in the course. Many considered that they needed more experience with the technology but at the same time knew the areas where their weaknesses lay and had the means to overcome these in the form of self-paced instructional materials.

Most Effective Components: There was little agreement in student responses about those components of the course that each judged to be most effective. Some considered the planning and delivery of their own telematics lesson to be the most useful component while others considered the class telematics sessions to be the most effective. It was expected that the students would rate the practical and technology-based activities as those through which most was learned. Many students rated the reading and video viewing as activities of high educational

value. It was apparent that among the group there was a range of preferred learning styles and the availability of a wide range of activities and learning opportunities provided an environment that appeared to cater well for all students.

SUMMARY

The purpose of this project was to create and implement a learning environment based on contemporary learning theories to enhance learning outcomes in a pre-service teacher education course. The module that was created provided a setting where students were able to construct their own meaning and understanding of issues and outcomes arising from the use of telecommunications technologies as a delivery medium for distance and rural education. The outcomes and initial findings from an implementation of these ideas has provided very positive results. The project has demonstrated a powerful alternative to the conventional teaching format, one which is both efficient as a delivery medium and effective in the outcomes that are achieved. Implementation is planned for 1996 and will involve a more rigorous examination of learning outcomes to more fully ascertain strengths and weaknesses of the alternative teaching approach.

The further practical implications arising from this project are clear. Pre-service teacher education institutions are in a position to provide their students with the necessary understandings and skills in the use of telecommunication technology. This, however, calls for a concerted effort. Unless telecommunication technology is afforded priority status, its full potential will not be realised, opportunities will be lost, the present disparity between educational services available in rural and urban schools will continue to widen and teacher educators will again have failed to provide those experiences that help to ensure that rural children are provided with the extended educational access that is their right.

ABOUT THE AUTHORS

Ron Oliver is a Senior Lecturer specialising in multimedia and information technologies at Edith Cowan University. He has extensive experience in implementing and researching applications of computer technologies in school curricula and has a particular interest in technologies that support open-learning and distance education. He leads a number of school-based research projects involving use of the Internet and telecommunications for instructional purposes.

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