AUDIOGRAPHIC TELETEACHING IN PRE-SERVICE TEACHER EDUCATION

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INTRODUCTION

Preparing teachers for rural school appointments through including courses in their pre-service program that examine issues about rural lifestyles, community participation, and provide opportunities for multigrade and rural practice teaching experiences have been identified as an important teacher recruitment strategies for rural schools (Watson, et al, 1986; Smith-Davis, 1989; Cross and Murphy, 1990; Luft, 1992). One research outcome from these studies suggests that when students are provided with these components in their pre-service courses their preparedness to seek and/or accept a rural appointment is enhanced.

TEACHER EDUCATION AT CHARLES STURT UNIVERSITY

Staff from the Rural Education Research and Teaching Unit within the Faculty of Education have developed a number of pre-service courses for elementary and secondary teachers which incorporate those attributes identified above. In particular students engage in theoretical and practical studies of:

i) rural communities and the school-community relationship;

ii) roles and expectations of teachers in rural settings;

iii) multigrade organisational and teaching strategies;

iv) practice teaching experiences in small rural schools (Smith, 1988).

Charles Sturt University is a multi-campus university serving the tertiary needs of students from inland New South Wales. Teacher education courses are offered on the Wagga Wagga campus and the Bathurst campus which are 300 kilometres apart.

TECHNOLOGICAL CHANGE AND RURAL SCHOOLS

Over the past five years, significant changes in the possible modes of delivery of education into rural New South Wales schools have occurred. Development and improvement of communication technologies have brought rural schools to the forefront of educational provision. Barker (1990) has categorised the range of tele-communication distance education technologies used by schools into three types based on delivery mode:

i) audiographic teleteaching;

ii) satellite TV teaching; and

iii) two-way TV instruction.

Barker (1990) and Boylan and Hemmings (1992) have analysed the relative strengths and weaknesses of each form of delivery and concluded that there is no one best method of delivery. Rather, they argued each approach may be the most appropriate for one group of schools given the range of financial, educational, and community based considerations that occur.

In the New South Wales education system, communication technologies have been trialled in clusters of rural schools since 1990 (Metherell, 1989). The primary form of communications technology used has been audiographic teleteaching or telematics as it is known locally. Telematics involves the use of three components:

i) the voice link — a loud speaker conferencing telephone;

ii) the computer link — a macintosh computer running an electronic whiteboard software known as Electronic Classroom (Crago, 1993); and

iii) the document link — a facsimile machine.

Boylan (1992), Walker and Boylan (1992) and Squires and Sinclair (1992) have documented the impact of telematics on small rural central (K-12) schools in New South Wales. They have identified how teachers have modified teaching strategies, increased curriculum diversity and choice for students, and improved participation and retention of students to the end of secondary education (Year 12). Squires and Sinclair (1992) have recommended the continuation of the program and extension of telematics to other rural schools.

TELEMATICS IN THE PRE-SERVICE COURSE

Given the recent introduction of telematics into rural schools, the rural education staff on both the Wagga Wagga and Bathurst campuses of Charles Sturt University decided to include telematics teaching and learning strategies as an innovative component of their pre-service rural education subjects. This innovation represented the first systematic inclusion of telematics within any pre-service elementary teacher education course in New South Wales. The program covered practical activities and reflective experiences that sought to develop student competence in and understanding of:

i) the operation of the three components used in telematics;

ii) the analysis of methods of planning, preparing and teaching via telematics; and

iii) the delivery of practical teaching sessions between students located on each campus.

During the second semester of 1993, this program was implemented with 120 final year elementary education students from both campuses. This program represented approximately one quarter of the content of the rural education subject being studied by these students.

STUDENT REACTIONS

As part of this innovation, we sought student responses to:

i) the operation of the equipment;

ii) the strengths and weaknesses of the mode of delivery; and

iii) their experiences of teaching via telematics.

A questionnaire was administered to all students and a response rate of 59% was achieved (N = 71).

Overall, students responded to the telematics innovation very positively. For the majority of students (100%, N = 71), this was their first exposure to telematics. Students were asked to respond to a series of 6 point likert scale items on the ease of operation of the equipment where 1 = very easy, 6 = very difficult. Responses to items concerning the operation of each component

revealed that the voice link had a mean value of 1.64 (s.d. = 0.96), the computer link's mean value was 2.36 (s.d. = 0.96) and the document link's mean value was 2.52 (s.d. = 1.39). Overall, these findings indicated that the technology was perceived to be easy to use.

A series of questions sought student perceptions of the degree of importance to their teacher education of:

i) verbal telecommunications between lecturing staff and students, and between students; and

ii) computer based graphical communications.

A six point likert scale was used to record responses (1 = not at all important, 6 = extremely important). In Table 1 student responses are presented.

TABLE 1

STUDENT RESPONSES

Item	Mean Response	Standard Deviation
• Listening to lecturer	4.42	1.41
• Talking with other students	4.87	1.25
• Discussion with other students within my own group	4.57	1.27
• Discussion with other students via telematics	4.70	1.37
• Communication by text on computer	4.89	1.20
• Communication by computer graphics	4.92	0.97

These results indicate that students valued the experience of being engaged in live telecommunication links, especially where this gave them the opportunity to interact with students on the distant campus by voice, by text-on-screen, or by using graphics.

Students were invited to provide written comments on the advantages and disadvantages of telematics. A total of 56 students (79%) provided many comments to these questions.

Advantages of telematics identified by the students included:

- it is a good way of providing education for isolated students (26%);
- it improves communication between teacher and students (20%);
- it provides access to curriculum areas not locally available (14%); and
- it develops computer/technology skills in the students (9%).

Several disadvantages of telematics were identified by the students which included:

- the lack of face to face contact with students being taught (40%);
- technical problems (e.g. telephone line dropping out) (18%);
- the preparation of lessons was time consuming (13%); and
- the difficulty in drawing accurately on the graphics tablet (10%).

From these comments, it is evident that the pre-service teachers were able to see the benefits of using telematics in rural schools to provide greater curriculum diversity, yet they were also aware of the additional demands (preparatory and technical) that using this form of delivery placed upon teachers.

Finally, students were asked to respond to two items that sought their overall reactions to telematics in their course. The first question sought their overall rating of telematics on a six point likert scale (1 = no potential, 6 = a lot of potential). The students' mean rating was 5.52 (s.d. = 1.02). The second question asked students to indicate the views on the appropriateness of the amount of class time spent on telematics (currently 10 hours). 59% of students indicated that this amount of time should be increased. 38% indicated it should remain as it is and 3.1% indicated that less time should be spent on telematics.

These findings suggest that students have found the inclusion of instruction on and practice with telematics a worthwhile innovation in their rural education subject.

FUTURE PLANS

We have been encouraged by the response of the students and plan to make audiographic teleteaching an integral component of our elementary rural education subjects. Further, we plan to introduce audiographic teleteaching into our secondary pre-service program in 1994. A number of rural central schools within the regions served by Charles Sturt University are already part of telematics clusters. There is potential for students of the University to:

- undertake practice teaching sessions in these schools, including the experience of delivering lessons telematically to pupils in other schools in the cluster; and
- using equipment at the University to deliver or participate in lessons which are part of the normal program offered across the telematics cluster. That is, the students will be able to participate without leaving the University campus.

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