Interactive Television Brings University Classes to the Home and Workplace

Joyce Carver
Ruth C. MacKay

Abstract: Live, interactive television over the Anik C III satellite delivered a university credit course in nursing research to 36 registered nurses in the Maritime provinces. Student grade achievement was similar to on-campus courses. Student evaluation of the delivery method on a post-course questionnaire *(n* = 34) indicated that the televised approach achieved the objective of making credit courses more accessible to working nurses. Flexibility of study time and place were the most frequently stated advantages. All reported they would recommend to others that they take a TV course. Eighty-three percent *(n* = 30) of the sample registered for the next course given this way out of a total course registration of 81.

Design of courses with a clinical application component and adequacy of library resources will be studied in the delivery of future courses. More detailed cost analysis will also be sought.

Seven thousand registered nurses across Nova Scotia lack the baccalaureate nursing degree. Dalhousie University School of Nursing is addressing the problem of making undergraduate credit nursing courses accessible to these nurses. Nurses in the immediate university area, as well, have difficulty attending classes on campus because of the varied time demands of shift work and family responsibilities. Written requests to the school from nurses in Nova Scotia for outreach classes have increased since 1981 when the professional association resolved to ask the universities "...to seek ways of making baccalaureate nursing courses available to nurses living outside the university areas" (RNANS, 1981). A mail survey conducted in 1983 through the professional and union associations further confirmed the need for outreach programming.

This paper reports on the first of two full credit courses offered by Dalhousie University School of Nursing via live interactive television during 1984-85. The paper describes the delivery method, course design, and student achievement and attitudes towards the delivery method. The courses were presented in cooperation with the Distance University Education by Television (DUET) system developed by Mount Saint Vincent University

Joyce Carver is Assistant Professor of Nursing and Co-ordinator of the Bachelor of Nursing program at Dalhousie University, Halifax, Nova Scotia. Her research interests include the use of educational technology in nursing education and she teaches community health nursing. **Ruth C. MacKay** is Associate Professor of Nursing at Dalhousie University and teaches in the Bachelor and Masters of Nursing programs. Her research interests include nursing and medical behavorial sciences.

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(Carl, 1983), Issues are highlighted which must be addressed if this teaching method is to have a significant, long-term impact on the problem of educating professionals at a distance.

DELIVERY METHOD

Our decision to test the DUET system was based on its reported success with our courses (Carl, 1984), and on the work of Collins (1982) with televised nursing education in British Columbia. Collins concluded that the use of satellite based instruction is a viable alternative to traditional classroom instruction for nursing education. Collins' findings were based on a field test with a continuing education course in Nursing Assessment followed by a credit course, "The Teaching/Learning Process in Health Care". Although the DUET system has some differences, the recommendations of Collins (1983, pp. 172-179) provided valuable guidelines for our work.

Cost

Cost and accessibility of the delivery method played a role in our decision to offer courses via television. Resources available through the Atlantic Satellite Network (ASN) and DUET have a major impact on cost. Free educational broadcast time provided by ASN enables DUET to access the Anik C 111 satellite. The signal is carried by most cable TV companies in the Atlantic Region, thus allowing students to view classes at home or work, provided they subscribe to cable TV Our broadcast costs are limited to rental of the DUET classroom with its experienced technical team. Sharing arrangements to keep costs of educational technology systems manageable are suggested by Ruggles, Anderson, Blackmore, LaFleur, Rothe & Taerum (1982, p. 80).

Teaching by television often evokes images of high cost and lack of spontaneity mainly because individuals assume that a commercial broadcast approach will be employed. Carl (1984) argues that a production-expertise dominated system is inappropriate for higher education, resulting in unnecessary costs, and restricting the dynamism of university teaching. The prime consideration of DUET is to make it as user-friendly as possible so that faculty can teach the way they normally do in any classroom; faculty are the key and DUET is their teaching tool (Carl, 1984).

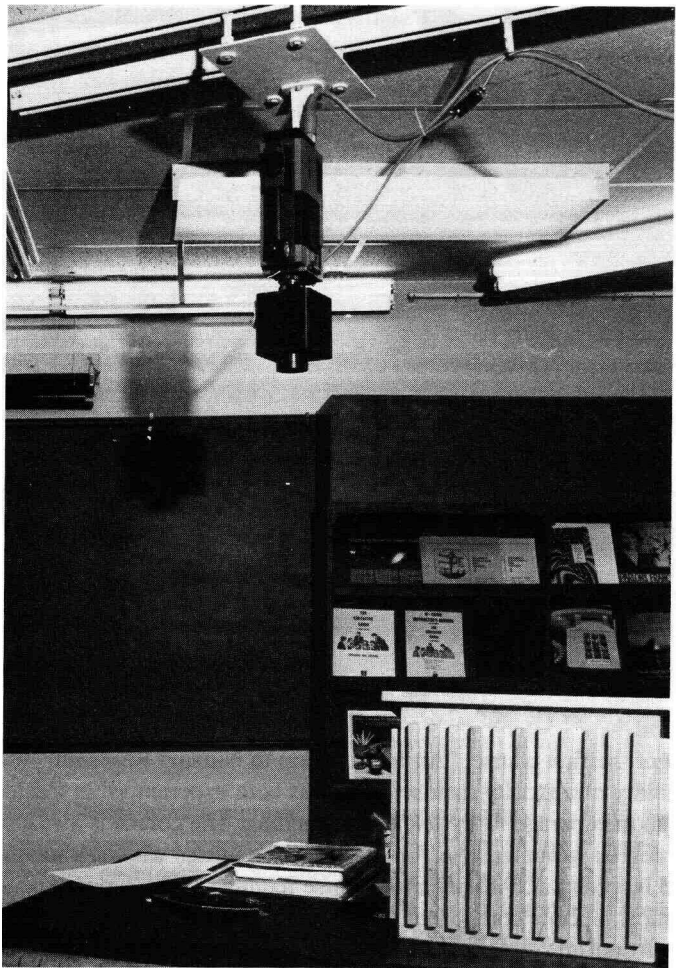
With the DUET system, three video cameras in a regular university classroom replace the structured, highly technical TV studio environment normal for expensive production standards of broadcast television. There is a small control room at the back of the classroom One stationary camera gives wide angle views and a technician operates a second camera on a wheeled tripod from the classroom floor.

The professor controls the third camera and uses it in much the same way as an overhead projector. The camera is suspended from the ceiling directly above the lectern (Figure 1). A professor places materials for projection in a specified area on the desk and focuses or frames the picture with push button controls attached on the right side of the desk (Figure 2). This adds flexibility to the presentation because picture and object, as well as word diagram overheads, are easily projected.

Accessibility

Teaching over open broadcast satellite offers tremendous accessibility and flexibility in study place and time. Common use of home videorecorders makes the system even more accessible. Our previous use of audio-teleconferencing was suitable for graduate nursing seminars (Carver and MacKay, in press). However, the current lack of a widespread audioteleconferencing network in Nova Scotia severely limits the number of small, widely

FIGURE 1.
Overhead camera suspended direcly above lectern.



dispersed groups we can reach. While some smaller communities do not receive cable TV, service is otherwise widespread across the province.

IMPLEMENTATION

We used a project team approach, formed along the lines of that described by Collins (1983, p. 65), consisting of three members: content specialist, co-ordinator, and administrator. The content specialist has primary responsibility for designing and teaching the course and student evaluation. The course coordinator is a resource to the content specialist for specific needs relevant to the course design and evaluates the delivery method. This person also makes arrangements for technical requirements, faculty orientation, office services, student registration, and liason with outside agencies. The administrative member looks after budget and publicity.

FIGURE 2.

Push Button Controls Operated by the Professor when Using the Overhead Camera.

Course Selection

Selection of the first course, "An Introduction to Nursing Research," was based on need and the availability of a faculty member who was both experienced in teaching the course on campus and had the courage to try television teaching. The course is a requisite for the baccalaureate degree in nursing and for baccalaureate nurses who lack the prerequisites of entry to our M.N. program. Although the course requires a laboratory experience, it does not have a clinical practice component. There is a statistics prerequisite. Students lacking a formal course in statistics were permitted to register if they passed a test based on a home study statistics program designed and administered by the faculty member teaching the course.

Publicity began in May for the September course and was conducted only through professional association publications and booth information at conferences. Registration was handled at the School of Nursing rather than the central university office.

Three main factors negatively influenced enrollment: short lead time for publicity, general disbelief that the endeavor would materialize, and the statistics course prerequisite. Thirty-seven students registered; only one student withdrew. Eighty-three percent (n = 30) registered for the second course which had more than twice as many students (n =81) and a similar attrition rate (n = 2).

Faculty Preparation

A number of adjustments are necessary for faculty teaching by live interactive television. These relate primarily to timing during the class, use of visuals readable on TV, how to compensate for lack of student feedback (i.e., both non-verbal and verbal) which is available in regular classroom teaching, and how to facilitate and humanize

interaction with students at a distance. A high degree of organization is essential. We found that planning time is one and one half times greater than for on-campus courses the first time taught by television. On second offering, now underway, the planning time was similar to any other course the professor has taught before.

A six-hour experiential orientation to live interactive television teaching was made available to faculty and required for those teaching the course. All faculty involved voiced positive attitudes to this teaching method afterwards. The main concern they express is that teaching workload may increase because of higher student enrollment.

COURSE DESIGN

The first full credit course was equivalent in content and hours to that offered on campus in a traditional face-to-face classroom setting. It was taught in two weekly live televised classes of one and a half hours each over a single semester of 13 weeks. Telephone interactions between students and faculty both on and off air replaced traditional face-to-face office visits. The instructor prepared printed materials for students: a detailed course outline, notes regarding particular difficulties in assigned readings, weekly guides for the laboratory periods, and detailed instructions for completing assignments.

There was a required laboratory session of two hours weekly. Laboratories used a small group format for informal self-directed discussion of course material, with the focus an assigned laboratory problem. The small groups met at local sites convenient to students. Laboratory sessions had two objectives: (a) the opportunity to apply principles taught in class to problems familiar to professional practitioners, and (b) time to discuss class materials, for clarification of difficult points, or to enhance learning of principles through active involvement with the material.

Teaching Strategies

The televised classes used a number of teaching strategies. Lectures were a major component of many classes. Therefore, the usual visual aids of the overhead (camera) and blackboard were used frequently. Some slides were used as well.

Guest lecturers are particularly valuable as they give a specialized view of a topic. Several times guests were interviewed to offer variety in approach, but also to evoke discussion of controversial material or to demonstrate particular skills. For example, one dialogue with a guest used role playing to show how an investigator might discuss with a nurse manager the means of gaining access to research subjects.

Interaction

Students were encouraged to telephone the classroom (collect if long distance) during live classes to ask questions or give comments. An average of two or three calls were made per class. Many preferred more private consultation during telephone office hours. Students were asked to submit written questions for discussion in class and a number were received. Mailed audiotapes for questions and responses were also used with a few geographically isolated students.

EVALUATION OF STUDENT LEARNING

Laboratory group assignments were mailed to the professor each week for review and comment. Four pre-selected laboratory assignments were evaluated to give a group mark

which constituted 40% of the individual student's grade.

Individual work provided the basis for 60% of the student's achievement in the course. This grade was based on a paper and a test. The paper represented selected components of a proposal for an imaginary small-scale investigation of a problem in nursing practice. The test at the end of the course consisted of multiple-choice questions designed to serve as a critique of a published study report. The test was administered in four geographic locations.

Student Characteristics

All 36 students were actively registered nurses and a self-selected group by virtue of course registration. All but one was female. Forty-two percent *(n* =15) were previously admitted to the post RN-BN program; and an equal number applied for and obtained admission upon registration for this course. One student had a baccalaureate in nursing and needed the course to qualify for the graduate program. Three students used the course as a transfer credit for a nursing degree at another university in the region. Two were registered on a non-degree basis.

Eighty-nine percent *(n* - 32) of the students completing the course were from Nova Scotia, and 46% of these *(n* =18) were from the Halifax-Dartmouth Metro area. Fifty-eight percent *(n* =21) worked full-time and 31% *(n* =11) worked part-time.

Student Achievement

Grade achievement in the televised course was comparable to what has been experienced generally in the teaching of the course on campus. One student withdrew for personal reasons. Thirty-six students completed the course with a range of grades from A- to C, along what we would consider a normal distribution.

It is a basic assumption that student learning in the televised course is not essentially different from the campus course. However, it should be noted that a different professor taught the course on campus. As well, the campus course had important differences in student characteristics. Therefore, we were unable to make exact comparisons.

Student Attitudes

The results of a post-course questionnaire returned by mail from 34 students (94%) at course completion are contained in Table 1 (see next page). Eight-five percent (n = 29) of the students said it was very helpful to see the professor and 71% (n = 24) thought it would be much more difficult to learn from a correspondence course with phone calls and no TV component. Ten students (29%) felt they were not at all disadvantaged by lack of face-to-face professor contact. Only one student found learning through this delivery method uncomfortable. Comments from open-ended questions indicated students need encouragement to use the phone-in question opportunities for interaction. However, the fact that many students viewed classes in rebroadcast or recorded sessions removed the possibility for them to use a live question period regularly. All but one respondent recommended that this course be offered on TV again, and all stated that they would recommend a TV course to others.

On an open comment item about the delivery method, students were overwhelmingly positive and requested more courses be given by live television. The tremendous flexibility of student time and place was repeatedly mentioned by students regardless of their location.

SERENDIPITOUS FINDINGS

Presently unmeasurable is the public relations aspect of teaching on open broadcast television. Phone inquiries and comments made to faculty indicate there are many viewers

TABLE 1
Responses to Post - Course Questionnaire (n = 34)

Question	Response		
1 . Learning through this delivery method was:	Very Comfortable	16	48.5
	Comfortable	16	48.5
	Unconfortable	1	3.0
	Very Uncomfortable	0	0.0
2. You were at a disadvantage not having face-to-face contact.	Yes	5	15.0
	No	10	29.0
	Sometimes	19	56.0
3. It was helpful to see the the professor.	Very	29	85.0
	Somew	4	12.0
	Not very important	0	0.0
	Not at all important	1	3.0
4. Do you think a correspondence course with phone calls and no T.V. component would be:	Easier to learn from?	0	0.0
	Just as easy to learn from?	1	3.0
	Not as easy to learn from?	9	26.0
	Much more difficult to learn from?	24	71.0
5. Would you recommend this course be offered on the T.V. again?	Yes	33	97.0
	No	0	0.0
	With changes	1	3.0
6. Would you recommend taking a T.V. course to others?	Yes	34	100.0
	No	0	0.0

Note: Percentages for each question = 100.

who are not enrolled in the course, some of whom are not nurses. We have received comments from nurses that the TV courses will have a positive impact on the public image of nursing. Our serendipitous findings are confirmed by the following student comment on the post-course questionnaire:

> ...you reach nurses who are not involved in the course and interest them in working on their nursing education. The TV reaches a much wider nonpaying audience and offers them a glimpse of what the courses are like. Good P.R.!

An added benefit is the two minute station break times which we use for announcements about upcoming courses and events.

LIBRARY RESOURCES

Students were asked about their knowledge and use of libarary resources as a result of the course. Since most distance learners practice where they live, learning to use local

library resources maximally and to tap university libraries are important outcomes. Ninety-seven percent *(n* = 33) reported they knew more about available library resources than before the course. About one third *(n* = 8) said they read the Canadian Nurses Association journal more, and over two-thirds *(n* = 23) said they read more journal articles available to them.

COSTING THE PROJECT

A detailed cost analysis was beyond the scope of this feasibility study. Tuition fees for distance students were the same as for students on campus. A developmental grant from the university paid for a teaching assistant, classroom rental, technician, mail, phone, printing and typing costs. The tuition fees of twenty-five students would have covered these costs. It is estimated that an additional twelve tuition fees will cover most faculty costs. However, tuition fees are made payable to the university. Fund redistribution is being considered and it is hoped that this kind of tuition disbursement will enable the School of Nursing budget to accommodate increased enrollment. The developmental grant is extended for three more years and a more detailed cost analysis will be a major focus for study in the next courses offered.

DISCUSSION

Experience in the teaching of this course in research methods to registered nurses through live interactive television shows it to be a welcome and effective teaching medium. The advantages to students who can live and learn in their own home towns are many.

Advantages

Flexibility of study time and place is by far the major advantage. Students use home video recording more than had been anticipated. Even when they can view live classes, home recording allows students to review class segments again, especially for content difficult for them, or to clarify their notes and instructions. Students point out the ease of "catching up" if classes are missed due to illness or work, because they can record TV classes. When they miss on-campus classes the most they can do is borrow notes that may be difficult to interpret.

Home recording raises copyright concerns. Students are granted permission to record classes for their personal study use only, and are asked to comply with copyright laws in tape erasure. The faculty member holds copyright for all programs as stipulated by the union contract.

Because students can attend class at home or sometimes at work, travel time and costs are reduced. Child care and parking problems evaporate. Students find they are able to manage two courses rather than only one as they planned. They often attend classes on the job in TV viewing rooms arranged by staff educators. In this way they can be reached if a patient emergency arises.

Disadvantages

It was difficult to encourage the poor student who did not seek out help. Experience with distance education may enable the professor to spot such students early in the course and to offer structured assistance.

Off-campus and part-time students may need access to writing/study skills workshops available to students on campus. Half of the students purchased the book, *Studying*

Effectively and Efficiently , (MacFarlane and Hodson, 1983) through the school. We recommend students seek non-credit courses in writing and time management that may be available in their local area. We hope that germinating plans to offer such courses on DUET will grow.

A major impediment to distance learning is the lack of convenient access to university library resources. Many students live in rural areas or small towns at some distance from a university, particularly one with a baccalaureate program in nursing and its attendant library resources.

There are hospitals and diploma schools of nursing in some locations which have been generous in sharing their library holdings. Further, the Kellogg Library at Dalhousie offers an inter-library loan service to registered nurses in Nova Scotia, and to other off-campus students. However, when materials are on loan to distant sites they are unavailable to university students on-campus. Although a number of course design strategies alleviate the need for library access for a particular course, this is a pressing long-term problem if we plan to deliver an entire program at a distance (Ellis, 1982). This serious issue is under review.

Future Considerations

Our next challenge is to test out additional courses with this delivery method. Future planning must assure that the quality of distance courses remains equal to that on campus. The role of student interaction and campus workshops as course components needs study, especially for courses with a clinical component.

Achieving an effective balance between independent and interactive activities is crucial. Interactive activities are deemed significant to learning but are costly and decrease flexibility for the student (Daniel and Marquis, 1983). As well, the importance of the faculty role as a human interface between educational technology and the learner needs attention (Forsythe, 1983).

Satellite communication automatically crosses provincial and traditional territorial boundaries. Our courses are broadcast to all areas receiving the ASN signal. Joint planning amongst universities in the region could result in rotating course offerings and the kinds of collaborative arrangements reported by Carey and Peruniak (1982) in Alberta.

CONCLUSION

Based on the students' achievement and reported attitudes from a pilot course offering, live interactive television teaching is a feasible way of making nursing degree credit courses accessible to nurses where they work and live. Additional courses using this delivery method are being offered and evaluated in relation to long term plans within a total program context. Creative course design using a combination of interactive and independent activities is a necessary and particularly critical point to be explored with clinical courses.

The issues of cost and library resources are priority concerns for us. Expansion in times of restraint requires defensible decision-making and a leadership willing to take risks while searching for excellence.

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