ABSTRACT

At the post-secondary level, various studies have been conducted to evaluate the educational effectiveness of different distance learning technologies. No published study was found that compared the perceived effectiveness and satisfaction of university faculty teaching in traditional and distance education courses. This study gathered responses from 46 faculty who taught via the Washington Higher Education Telecommunication System (WHETS), a video interactive television system, over three semesters to evaluate their perceptions and satisfaction. In general, faculty were satisfied with their instruction over WHETS in terms of the effectiveness of their teaching strategies, lack of need to make major curricular adaptations, and ability to perform selected activities in the classroom. Over two-thirds said they were satisfied with teaching over WHETS. The major factor contributing to loss of satisfaction was quality of student--teacher interaction. Results are being used to design effective faculty development programs.

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EVALUATION OF PERCEIVED TEACHING EFFECTIVENESS: COURSE DELIVERY VIA INTERACTIVE VIDEO TECHNOLOGY VERSUS TRADITIONAL CLASSROOM METHODS

By Janet Ross Kendall and Muriel Oaks

Washington State University (WSU) has used the Washington Higher Education Telecommunication System (WHETS) since 1985 to deliver courses among students at WSU’s four campuses -- Pullman, the main campus, located in a rural area near the Idaho and Oregon borders; and Spokane, Tri-Cities, and Vancouver, WSU’s branch campuses, located in urban areas around the state. (A WHETS site is also available at the University of Washington in Seattle, and the University of Idaho is linked with an adjoining microwave system.) WHETS is a two-way video interactive telecommunications system that uses microwave technology to link sites. Students enrolled at the Pullman campus tend to be younger, full-time students. Students at the branch campuses are, for the most part, older (average age approximately 35 years), employed professionals who take courses on a part-time basis, although the demographics are beginning to change as more undergraduate programs are added.
Courses offered via WHETS are at both the graduate and undergraduate levels in such diverse areas as engineering, humanities, business administration, and human nutrition. The majority originate from the Pullman campus where most WSU faculty are located. About 30% of classes originate from one of the branch campuses. Courses taught to students at one campus may be delivered simultaneously to students at the other campuses. As of 1990, about 35 different courses are taught on WHETS each semester.

In recent years there has been a great increase in the use of distance education technologies to deliver courses to students at all educational levels. A recent report by the U.S. Office of Technology Assessment, Linking for Learning: A New Course for Education (1989), examines the use of such technologies to improve the quality of education for students and training for teachers at the elementary and secondary (K-12) levels. The report finds, for example, that prior to 1988, fewer than 10 states were significantly involved in distance learning; today virtually every state is involved in distance education activities.

At the post-secondary level, a number of studies have been conducted to evaluate the educational effectiveness of various technologies. Many have focused on the achievement of students in distance education and traditional classrooms (e.g., Chu & Schramm 1967, 1975; Ritchie & Newby 1989; Seigel & Davis 1990; Smith 1983; Whittington 1986). Almost without exception such studies have shown that students taking courses via distance education technologies achieve as well as students taking courses via traditional methods.

Others have examined students' satisfaction with various distance education technologies (e.g., Topper et al. 1975). For example, Barker and Platten (1988) sent a survey to the 31 students enrolled in a graduate teacher education course presented through the TI-IN Network. Responses indicated that 53.8 percent felt that the satellite instruction was as interesting as that received in a regular classroom; 38.4 said it was less interesting, while 7.6 percent said it was more interesting. Over two-thirds (69.2%) said they would enroll in other credit courses offered via satellite. Grimes, Nielsen and Niss (1988) evaluated the influence of student-teacher contact on on- and off-campus students' attitude toward the subject matter. Contrary to their expectations, there was little difference among groups; they stated, "we can not draw a general conclusion that greater student-teacher contact will lead to more positive attitude formation for students in a telecourse situation" (p. 42). Ritchie and Newby (1989) randomly assigned 26 college undergraduates to three classroom settings: traditional classroom with an instructor, TV studio with an instructor, and a "distant" studio classroom with television monitors and no instructor. In contrast to Grimes et al., their students in the "distant" classroom rated instruction less enjoyable than those students who had an instructor with them in the classroom; they also rated their involvement as significantly lower than the other two groups. However, the situation was somewhat contrived, and results may not generalize to students in real "distant" classrooms.

To our knowledge, no studies have compared the perceived effectiveness and satisfaction of university faculty teaching in traditional and distance education courses. Thus, the study reported here was conducted. Faculty were surveyed about their satisfaction with teaching over WHETS, the effectiveness of using the system to reach their educational goals, and their willingness to use the system again. Such information is critical in developing successful faculty development programs to increase faculty effectiveness in using the existing as well as the emerging distance education technologies.

METHOD
Instruments: Two questionnaires were used to collect the evaluation data reported here. Construction of the first questionnaire involved two steps. First, interviews were conducted with five WSU faculty members with experience teaching via WHETS as well as in traditional classrooms. The faculty were from five different academic departments and taught different types of courses (e.g., lecture vs. case study, graduate vs. undergraduate.) Their perceptions were used to construct a structured, self-administered questionnaire. The questionnaire consisted of demographic, open-ended, and forced-choice questions, several of which used a four-point Likert scale.

Because many of the forced-choice questions did not allow faculty to rate WHETS as "equally" effective in comparison to a traditional classroom, a revised questionnaire was prepared. This second questionnaire was intended to provide data more useful to personnel working on faculty development and support services. Personnel recognized the importance of knowing when WHETS is rated as equally effective so that time is not spent working on situations where WHETS and traditional classrooms do not differ. Three faculty who work with WHETS teachers identified 38 questions where an "equally effective" response would be more meaningful for faculty development planning; four questions judged to be unimportant were eliminated, and for the remaining 34 questions the four-point Likert scale was changed to a five-point scale (see Table 1 for example). Several additional questions were also written to collect information not included on the first questionnaire.

Table 1 EXAMPLE OF 4-POINT AND 5-POINT SCALE

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have had to give up some favorite teaching techniques because they don't work on WHETS.</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

Subjects: All 46 faculty who taught over WHETS during the 1989 calendar year received a copy of the first questionnaire. Each of these faculty members also had several years of experience teaching in traditional classrooms.

The second questionnaire was sent to the 12 faculty who taught over WHETS during summer 1990 and the 33 faculty who taught over WHETS during fall 1990. All faculty had several years of experience teaching in traditional classrooms.

Procedures: To gather faculty perceptions used in constructing the first questionnaire, faculty were interviewed in a location and at a time of their choice. Interviews were tape recorded to ensure accuracy of reporting of responses. Faculty were assured of confidentiality and told that tapes would be erased when the report was completed.

The mail survey procedures suggested by Dillman (1978) were followed for distributing and collecting all sets of questionnaires (i.e., use of a cover letter, pre-addressed return envelope, follow-up letter thanking faculty for participation, follow-up letter to faculty who had not yet returned the survey).

Data Analysis: Frequency distributions and crosstabulation tables were constructed to examine faculty responses.

RESULTS AND DISCUSSION
The first questionnaire was returned by 32 of the 46 faculty who taught during 1989, a 70% response rate. The second questionnaire was returned by 11 of the 12 faculty (92%) who taught during Summer 1990 and by 25 of the 33 faculty (76%) who taught during Fall 1990. Responses were combined from the three sets of questionnaires when questions were identical, providing data from 68 faculty; responses were analyzed separately for the questions that were different on the 1989 and 1990 questionnaires.

Perceived instructional effectiveness: Faculty were asked to compare the effectiveness of their teaching strategies over WHETS versus the traditional classroom. As Table 2 shows, almost all faculty used lecture, group discussion and question/answer strategies; the other four strategies were used by a majority of faculty. Lecture, case study and question/answer strategies were judged to be as effective over WHETS as in the traditional classroom. Ten percent of faculty indicated lecture was more effective over WHETS, and nearly one-third felt similarly about lab/demonstration strategies. In contrast, a significant percentage said group discussion, seminar, socratic, and question/answer strategies were less effective.

Table 2 USE OF TEACHING STRATEGIES OVER WHETS*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Who Uses</th>
<th>Less</th>
<th>Equal</th>
<th>More</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (N)</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Lecture</td>
<td>100 (68)</td>
<td>35</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td>Group discussion</td>
<td>96 (65)</td>
<td>72</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>Case study</td>
<td>49 (33)</td>
<td>33</td>
<td>61</td>
<td>6</td>
</tr>
<tr>
<td>Seminar</td>
<td>54 (37)</td>
<td>62</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>Question/answer</td>
<td>96 (65)</td>
<td>48</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>Socratic</td>
<td>59 (40)</td>
<td>60</td>
<td>32</td>
<td>8</td>
</tr>
<tr>
<td>Lab/demonstration</td>
<td>64 (23)</td>
<td>35</td>
<td>35</td>
<td>30</td>
</tr>
</tbody>
</table>

* Table includes all 1989 and 1990 respondents except "lab/demonstration" (1990 only).

Table 3 describes curricular adaptations faculty said they made when they began teaching on WHETS. Few faculty felt they needed to make changes to their syllabus, their course organization, assignments or exams. The majority indicated they had to make adaptations to their delivery, audiovisual aids, and interaction with students.

Table 3 CURRICULAR ADAPTATIONS*

<table>
<thead>
<tr>
<th>Curricular Components</th>
<th>No or minor changes (%)</th>
<th>Significant or major changes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course syllabus</td>
<td>79</td>
<td>21</td>
</tr>
<tr>
<td>Organization of Course</td>
<td>68</td>
<td>32</td>
</tr>
<tr>
<td>Interaction with students</td>
<td>38</td>
<td>62</td>
</tr>
<tr>
<td>Handouts</td>
<td>54</td>
<td>46</td>
</tr>
</tbody>
</table>
Faculty were asked to indicate whether using WHETS has affected their ability to perform selected activities in the classroom (Table 4). Items to which the majority of the 68 faculty indicated their ability was no different whether using WHETS or not included: respect students' opinion and feelings, stimulate students' critical thinking skills, prepare lesson plans based on needs of the learner, and encourage expression of different points of view. Half the faculty said WHETS sharpened their ability to consciously plan for the instructional event, and over four-fifths said they could use audio-visual aids as well or better over WHETS. Consistent with the results reported above, half the faculty selected "cannot do as well when using WHETS" to describe their ability to give hands-on experience, encourage participation in class discussions, and actively involve students.

Table 4 PERCEPTIONS OF EFFECTIVE TEACHING USING WHETS*

Question 13. The following list contains characteristics of effective teachers as described by a group of WSU professors. Using the key given, indicate the number of the response choice which best describes you for each item on the list.

<table>
<thead>
<tr>
<th>Teaching activities</th>
<th>Can't do as well on WHETS</th>
<th>Equal</th>
<th>Can do better with WHETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actively involve students</td>
<td>49</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>Encourage participation</td>
<td>54</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>Respect student's opinions</td>
<td>15</td>
<td>84</td>
<td>1</td>
</tr>
<tr>
<td>Stimulate critical thinking</td>
<td>26</td>
<td>72</td>
<td>2</td>
</tr>
<tr>
<td>Give hands-on experience</td>
<td>55</td>
<td>45</td>
<td>0</td>
</tr>
<tr>
<td>Consciously plan for the instructional event</td>
<td>5</td>
<td>46</td>
<td>49</td>
</tr>
<tr>
<td>Prepare lesson plans based on needs of learners</td>
<td>18</td>
<td>65</td>
<td>17</td>
</tr>
<tr>
<td>Encourage the expression of differing viewpoints</td>
<td>39</td>
<td>59</td>
<td>2</td>
</tr>
<tr>
<td>Use active, interesting audio-visual aids</td>
<td>18</td>
<td>42</td>
<td>40</td>
</tr>
</tbody>
</table>

* Table includes all 1989 and 1990 respondents.

Faculty were asked to respond to several open-ended questions. To "the one best thing about WHETS is . . .", 53% of the 68 faculty mentioned issues related to the value of increased access to education for place-bound students. One faculty member wrote: "It truly is providing desperately needed education to underserved areas." Time and cost savings for students and faculty were cited by 15% of respondents, and 12% mentioned that the quality and motivation of off-campus students was the one best thing about WHETS. Interestingly, there were a wider variety of comments made by faculty who taught in the fall 1990 semester than by those who taught during fall and spring semesters of 1989. Fewer faculty from a narrower range of academic departments had taught over WHETS as of 1989, and the institution viewed WHETS as a less expensive way to deliver high quality courses to placebound students; faculty seemed to be reflecting
this view. By fall 1990, more faculty had gained experience teaching over
WHETS, and a number of undergraduate general studies classes were being
taught to two branch campuses. The wider variety of comments probably is
due to the greater number of faculty from more departments who could
discuss their experiences in teaching over WHETS with each other and with
their colleagues, and who were able to see more benefits, as well as
drawbacks, inherent in the system.

Level of satisfaction: When asked to rate their level of satisfaction
with their teaching careers as a whole, 97% of the 1989 faculty reported
they were "satisfied" or "very satisfied." 1990 faculty responded similarly,
with 94% rating their teaching careers the same. Sixty-nine percent of
the 1989 faculty gave these same ratings when asked to describe their level
of satisfaction when teaching on WHETS; 31% chose "not satisfied" or "not
at all satisfied." 1990 faculty gave similar satisfaction ratings to
teaching on WHETS: 58% chose "satisfied" or "very satisfied." However, 31%
chose "equally satisfied", and only 11% indicated they were not satisfied.
Although the percentages indicating satisfaction with teaching on WHETS are
lower than those for their teaching careers as a whole, more than two--
thirds of 1989 faculty are satisfied with teaching via WHETS, and 89% of
1990 faculty are equally as satisfied or better.

The major factor contributing to differences in satisfaction levels
was a loss in the quality of the student-teacher interaction. Three--
quarters of the faculty said what they missed most in teaching via WHETS
was the lack of personal interaction with students at the other campuses at
which the course was received. This can also be seen in responses to
related forced-choice questions (see Tables 2, 3 and 4). For example, 88%
of 1989 faculty and 83% of 1990 faculty agreed it was very important to
visit students at other campuses. The five-point scale helped to clarify
responses to another related question, "My teaching over WHETS is more
impersonal than in an on-campus class." In 1989, 66% agreed that their
teaching over WHETS was more impersonal than in a traditional class. 1990
responses showed that only 41% agreed, while 18% felt teaching was similar
in either type of class setting.

Student characteristics: When asked to describe off-campus students in
comparison to on-campus students, 1989 faculty were nearly unanimous that
off-campus students were more motivated and had a higher achievement level
(Table 5). The five-point scale modified faculty members' responses
somewhat: two-thirds agreed that off-campus students were more motivated
and had a higher achievement level, but one-quarter and one-third, respect-
ively, indicated that there was no difference between the two groups of
students. There was less agreement about students as "self-starters"; 62%
of 1989 faculty chose "self-starter" while 38% said off-campus students
need more direction than on-campus students. Thirty-eight percent of 1990
faculty chose "self-starter", 35% chose the neutral response, and 26% said
off-campus students need more direction. This latter finding may be related
to the larger number of undergraduate classes being taught in 1990,
enrolling students less confident about their academic skills. In contrast,
most courses taught in 1989 were graduate courses which, for the most part,
enrolled working professionals.

Table 5 STUDENT CHARACTERISTICS (1)

<p>| Question 4. How do off-campus WHETS students compare to on-campus students taking the same course? |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|</p>
<table>
<thead>
<tr>
<th>% selecting response</th>
<th>% selecting response</th>
<th>% selecting response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>1,2</td>
<td>3,4</td>
</tr>
<tr>
<td>1990</td>
<td>1,2</td>
<td>3</td>
</tr>
</tbody>
</table>
More motivated           87                      13  Less motivated
64          24          12

More life experience       100                       0  Less life experience
70          21          9

Older                     87                      13  Younger
56          24          20

High achievement level     83                      17  Just get by level
62          32           6

Self starters              62                      38  Need direction
38          38          26

Academically confident      18          56          26  Academically insecure

(1) Data reported separately for 1989 and 1990, as %.
(2) Question not asked in 1989.

CONCLUSIONS

In considering their teaching strategies, the majority of faculty perceive lecture, question/answer, and case studies as more or equally effective over WHETS in comparison to a traditional classroom setting; group discussion and seminars were rated as less effective by a majority of faculty. The professors surveyed felt their general instructional effectiveness was not significantly diminished; they identified several instructional activities they could perform equally well in a WHETS or traditional classroom. The major concern faculty had was with the loss of the active involvement with students that they experience in a traditional classroom. Data collected in 1989 suggested this concern affected their personal satisfaction with teaching over WHETS; responses to the five-point scale used in the 1990 questionnaire suggest most faculty (89%) are equally as satisfied or better with teaching via WHETS. In fact, if asked, 96% would teach over WHETS again. Personnel working with WHETS faculty will continue to recommend that faculty consciously implement strategies that enhance interaction. Improvement of communications between faculty and "receive-site" students could be enhanced by bringing the two closer together through large screen television monitors, frequent written feedback from students, making electronic mail and computer conferencing systems easier to access, and encouraging personal visits to the "remote" campuses receiving the course.

This questionnaire will be completed by faculty teaching via WHETS each semester. Future analyses will examine effectiveness ratings by various groupings of faculty (e.g., undergraduate general studies vs. graduate business administration). Student evaluations of faculty teaching effectiveness and students' course grades are also being collected and will be correlated with faculty responses. The ultimate purpose of the data collection and analyses is to design meaningful and effective faculty development programs.

REFERENCES


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