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ABSTRACT

Teachers participating in an educational interactive video program were surveyed each year for four semesters. The survey instrument contained 31 five-point Likert-type questions, with questions concerning specific comparisons between interactive video and traditional teaching methods, and open-ended questions. A total of 74 teachers responded over the four-year time span. Although teachers report that interactive video teaching methods require more preparation and new methods, they also report more comfort with the technology use required for interactive video. More troubling is the decreasing view of interactive video as a good addition to the curriculum. Teachers report that time-on-task and learning are the same in traditional and interactive video classes. They overwhelmingly agreed that they received support from the educational interactive video project director, the remote principal, and other sources. Results are discussed in terms of teaching factors, student factors, student learning, teaching changes and preparation time, and teacher comments. An appendix includes factor and question means and several charts illustrating teacher respondents, teaching factors, student factors, and teacher comments. (Contains 13 references.) (Author/AEF)

Running Head: Teachers 95-98

# Educational Interactive Video for High School Students:

# How do Teachers Perceive the Program?

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Paper presented at the annual conference of the American Evaluation Association, Honolulu, Hawaii, November 1-5, 2000. For further information contact Lea Witta lwitta@mail.ucf.edu.

Abstract

Teachers participating in an educational interactive video program were surveyed each year for four semesters. The survey instrument contained 31 five-point Likert-type questions, 3 questions concerning specific comparisons between interactive video and traditional teaching methods, and open-ended questions. A total of 74 teachers responded over the four year time span. Although teachers report that interactive video teaching methods require more preparation and new methods, they also are reporting more comfort with the use of the technology required for interactive video. More troubling is the decreasing view of interactive video as a good addition to the curriculum. Teachers report that time-on-task and learning are the same in traditional and interactive video classes. They overwhelmingly agreed that they received support from the educational interactive video project director, the remote principal, and other sources. Results and procedures are discussed.

Technology is transforming our home and workplace environment. Interactive media such as interactive video systems are changing the manner in which education programs are provided. Increased use of educational interactive video for distance learning students has made classes previously inaccessible to rural high school students available locally (Monaghan, 1996). Thus, we may perceive interactive video as a means of providing equal educational opportunities to all students. There are, however, questions concerning this program.

Although interactive video technology has advanced rapidly in recent years, there is increasing evidence that no one technology works in every application. In addition, the technology utilized by interactive video requires a different preparation for teaching than traditional methods (Knapczyk, 1993). Other problems, however, beset teachers within interactive video system. Do interactive video teachers receive support from administrators of the program? Does the "distance" increase student behavior problems? Do students learn as much in the "distance" setting as in the "traditional" setting? Are there problems with use of new technology?

The purpose of this study was to examine teachers perceptions of an interactive video system across a four year time span. Specific questions to be answered concerned teachers perceptions of:

(1) administrative support over time,

(2) teaching factors (ie., comfort with technology, teach another interactive video class),

(3) student factors (i.e., student behavior, student study),

(4) student learning, and

(5) necessary changes (i.e., changes in teaching style) and preparation time.

## Review of Literature

The title "distance education" varies from study to study. Some studies refer to "distance education" emphasizing the education and distance role, while others refer to "distance learning" emphasizing the "students are responsible for their own learning" role (Bruder, 1991). In addition, some researchers (Bruder, 1991) have concluded that distance learning exposes students to a greater range of ideas and provides an atmosphere in which learners are more engaged in learning. The basic criterion, however, for distance education/learning is distance between the teacher and the student. The distance covered could be across the continent, across the state, or across the city. Distance education is not new. This technique was begun in the nineteenth century with correspondence education (Klesius, Homan, & Thompson, 1997). It has, however, changed from the correspondence delivery method, through radio methods, to today's computer and interactive video techniques. Today, distance education typically means the use of electronic telecommunications equipment such as television to send instructional programming to learners.

Distance education has been used for high school students as an alternative method to earn credentials in the General Education Development (GED) program, to obtain college credits (Green, 1996), or in attempts to revitalize curricular programs (Fucci & Hueston, 1997). Some universities have developed dual degree partnerships with interested businesses to provide on-site, on-demand graduate programs (Haynes & Pouraghabagher, 1997). And, some universities have developed programs to deliver education to rural areas or cultural groups (Monaghan, 1996).

Prior researchers in distance education have investigated student satisfaction,

communication techniques, teaching behavior, and change fostered (Moore & Thompson, 1990). When a distance education program has active support, some researchers have found no differences in program rating between home and remote sites. Thyer, Polk, and Gaudin (1997), however, reported that live instruction was rated significantly higher at a college campus than distance learning. They add that distance learning has not yet demonstrated comparable outcomes in terms of student learning.

Because distance education places students in the situation in which there may be no direct interaction or association with other students or the teacher, system requirements must be sound. Carter (1997) found that audio was the most important element of interactive education, followed by lighting. Witta (1999) found that audio weaknesses were the most frequently cited problem in a new interactive video network, but that equipment weaknesses decreased over time. She concluded that support or responsiveness of the program administrators led to solutions of equipment problems.

In addition, the importance of the role of the teacher or facilitator has been emphasized by several researchers. Interaction of the instructor with students in use of educational interactive video programs has been stressed by researchers such as Garrison and Baynton (1987, as cited in Dillon, Gunawardena, & Parker, 1992). Tiene (1997), however, found that three of five teachers in an interactive video system agreed that interaction with remote site students was more difficult.

Although the use of distance education provides the obvious advantage to take otherwise unavailable classes, as the role of distance learning expands, it is essential that the problems unique to this format be examined (Wilson, Litle, Coleman, & Gallagher, 1997/98). What do teachers

perceive as advantages and disadvantages of the distance education program? How do programs change over time?

## Procedure

Teachers participating in an educational interactive video program for high school students were surveyed for 4 semesters during a four-year time span. The survey instrument contained 27 five-point Likert-type questions with responses ranging from strongly agree to strongly disagree. A non-applicable response was also permitted. An additional four questions assessed the teacher's perceptions of support from various program administrators using a 5-point scale ranging from poor to excellent. Three additional questions requested specific comparisons between interactive video and traditional teaching methods. Finally, teachers were asked if educational interactive video instruction had changed their style of teaching, were requested to explain how their teaching methods had changed, and were asked for any comments.

### Reverse coded questions

Eight of the 27 five-point Likert-type questions on the questionnaire were negatively stated. These questions were reverse coded. For example, question 15 and question 18 provided similar responses. Question 15 concerned hesitating to teach another educational interactive video class. Question 18 concerned interest in teaching another educational interactive video class. The numeric code for disagree was a 2. The numeric code for agree was a 4. If a respondent disagreed (2) they would hesitate to teach another class and agreed (4) they would teach another class, the two responses provided the same information. Based on the numeric codes, however, the average for the two responses would have been a 3 ((4+2) /2), neutral. Question 15 was, therefore, reverse

coded so that disagree became a 4 and agree became a 2. Similarly, strongly disagree became a 5 and strongly agree became a 1. Each negatively stated question was reverse coded in a similar manner. All reverse coded questions are designated as a recode in Table 1 in the appendix and in the figures.

## Results

Thirty-four teachers responded to the Spring 1998 survey. When combined with the Spring 1995 responses (8), the Spring 1997 responses (16), and the Fall 1997 responses (16), the total number of respondents was 74 (see Figure 1). Because this is a relatively small sample, a logical combination of the variables to answer specific questions was attempted. This procedure resulted in 10 general factors.

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Insert Figure 1 About Here

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The data factors were grouped in general categories to provide for an easier depiction. The grouping chosen included support, teaching factors, student related factors, and some specialized questions. These groups were depicted by semester to describe results. Then, the mean of each question used to form a factor was displayed by semester.

### Teaching Support

The first issue explored was the perception of teachers concerning support by others associated with the educational interactive video program. The support factor provided an evaluation of the assistance of the remote principal and facilitator, the project director, and in

general for all activities. Responses for this factor could range from poor to excellent. For each question, the rating was higher for the Spring 1995 survey semester than for other semesters. In all cases, the rating was no lower than good (see Figure 2).

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Insert Figure 2 About Here

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Teaching Factors

Teaching factors encompassed responses concerning comfort with the technology used in the program, evaluation of benefit of educational interactive video classes, willingness to teach another educational interactive video class, difficulty with discipline and cheating at remote sites, and familiarity with remote site students. The group of teaching factors is depicted in Figure 3.

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Insert Figure 3 About Here

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Responses concerning comfort with educational interactive video technology have improved across survey years. In the Spring 1995 semester, respondents reported agreement or undecided concerning their comfort levels with interactive video educational methods. The greatest improvement was seen in question 22 (see Figure 4) concerning comfort with the technology aspect of educational interactive video. During the Spring 1995 semester respondents were undecided about the comfort level with Educational interactive video technology. By the Spring semester 1998, respondents agreed they were comfortable.

Program Evaluation, on the other hand, was high (strongly agree to agree) in Spring 1995 but decreased (agree to neutral) for the remaining three semesters (see Figure 3). Of the two questions forming this factor, question 14 concerning educational interactive video being a good addition to the curriculum shows the most change across semesters (see Figure 5). In the Spring 1995 semester respondents agree to strongly agree with this statement. The following semesters are all agree to neutral.

The factor concerning willingness to teach another educational interactive video class was similar to program evaluation (see Figure 3). During the Spring 1995 semester, respondents agreed they would teach another educational interactive video class. There was a steady decline across semesters. By the Spring 1998 semester, respondents were undecided whether they would teach another educational interactive video class. Although there was a decline in all four questions forming this factor, question 16 provided the lowest responses. Teacher respondents were undecided in 1995 whether given choice, they would prefer to teach an Educational interactive video class to a traditional class. By 1998, the respondents disagreed they would prefer educational interactive video (see Figure 6). Similarly, respondents had progressed from agree they would teach another educational interactive video or disagree they would hesitate to teach another in 1995 to undecided or neutral in 1998.

The discipline/cheating factor exhibited the most erratic behavior of the five teaching factors. Responses varied from agreed the teachers were comfortable with discipline in 1995 to undecided in Spring 1997 to midway between agreed and undecided in Fall 1997 to undecided in 1998 (see Figure 3). This variability is reflected most obviously in the responses to question 26,

comfortable disciplining remote students, but is also noted in the reverse coded questions 10, more cheating educational interactive video, and 8, class discipline problem in educational interactive video (see Figure 7).

The only teaching factor that appeared to be relatively stable over time was the visit/know remote site students factor. This factor was formed by five questions (see Figure 8). Respondents agreed they know their remote site students, and provided equal support for home and remote site students. They also disagreed that the limitations of educational interactive video affected students grades (reverse coded question). They were, however, neutral or disagreed that they had time to visit remote sites and agreed or were neutral concerning difficulty of transfer of materials.

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Insert Figures 4-8 About Here

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Student Factors

The student study factor provided the most noticeable variability in the student factors (see Figure 9). Respondents were basically undecided for the three questions forming this factor across semesters. There were, however, differences in the degree of undecided. All three of the questions forming this factor were reverse coded. Respondents agreed educational interactive video was more difficult or were undecided (question 19), disagreed or were undecided that educational interactive video required more study (question 12), and disagreed that educational interactive video required more study and preparation (question 20 - see Figure 10 ).

Insert Figure 9 About Here

Respondents consistently agreed or strongly agreed across semesters that students had an appropriate environment for class work. They agreed respondents had an appropriate amount of desk space and a clear sight of the TV (see Figure 11). In 1995 respondents also agreed that both home and remote site respondents enjoyed the educational interactive video class. In Spring 1997, however, teachers still agreed home site students enjoyed the class, but were undecided concerning remote site students. By Fall 1997, teachers were undecided concerning either group of students (see Figure 12).

Although teachers in 1995 agreed there was good student interaction in the Educational interactive video class, all subsequent semesters respondents were relatively undecided. Teachers were also undecided concerning whether students became better listeners due to the interactive video methods (see Figure 13).

Insert Figures 10-13 About Here

Student Learning

Teachers overwhelmingly agreed that student time-on-task (see Figure 14) and the amount of learning (see Figure 15) were the same whether traditional methods or interactive video methods were used.

Insert Figures 14 & 15 About Here

Teaching Changes and Preparation Time

While teachers also agreed they would make changes in their approach the next time they teach by interactive video (see Figure 16), they were not consistent concerning educational interactive video instruction changing their style of teaching (see Figure 17). To illustrate the changes needed some teachers responded that they are less spontaneous and flexible while other replied that they were more creative, more aware, and used more multimedia (see Figure 18). Teachers also indicated that teaching by interactive video required better preparation (Figure 18) and more preparation time than traditional methods (see Figure 19).

Insert Figures 16-19 About Here

Comments

Additional comments by teachers indicated there were some problems in scheduling and with equipment (see Figure 20). Teachers participating in interactive video programs needed more planning time and needed to have a scheduled time for remote site visits with their regular classes covered by another instructor. In addition, one respondent requested that school board members be exposed to the same training as educational interactive video teachers.

Insert Figure 20 About Here

## Conclusion

Teachers overwhelmingly agreed that they received support from the educational interactive video project director, the remote principal, and other sources. And, although teachers reported that interactive video teaching methods required more preparation and new methods, they also reported more comfort with the use of the technology required for interactive video.

Teachers reported that time-on-task and learning are the same in traditional and interactive video classes. They were, however, undecided concerning the amount of study for an interactive video class, the amount of student interaction, and whether students became better listeners.

More troubling is the decreasing view of interactive video as a good addition to the curriculum. One respondent reported that although there were qualified teachers at their school, one class was taught as a remote site using educational interactive video. In addition, some teachers reported that although they are permitted to visit their remote site students, they are not given time to do so. Then they are responsible for finding some one to cover their regularly scheduled classes at the home site. Consequently, the willingness to teach another interactive video class is decreasing.

Several teachers suggested more planning time and better scheduling to provide for increased time demands to visit the remote site and to prepare for classes. These findings imply the need for continuous monitoring of teacher responses and adjustments to the system to support

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# Appendix

Table 1: Means of Factors and Questions by Semester

Table A-1 Factor and Question Means

| | Spring 95 | Spring 97 | Fall 97 | Spring 98 |
|---|---|---|---|---|
| F1TCHANO Teach Another (Mean q16,18 ,q1,q15R) | 4.0312 | 3.3437 | 3.1667 | 2.9056 |
| Q1 Enjoyed | 4.75 | 4 | 3.93 | 3.56 |
| Q15 R-Hesit Tch Ano | 4.25 | 3.31 | 3.37 | 3.25 |
| Q16 Choice - ITV | 2.75 | 2.56 | 2.13 | 2 |
| Q18 Teach Another | 4.37 | 3.56 | 3.31 | 3 |
| F2DISCHE Discpline/Cheat (Mean 8R,10R,26) | 4.2083 | 2.9167 | 3.5833 | 3.1562 |
| Q10 R More Cheating ITV | 4.25 | 2.81 | 3.13 | 3.1 |
| Q26 Comfort Discip Remote | 4.14 | 2.75 | 3.89 | 3.43 |
| Q8 Class Discipline Prob ITV (recode) | 4.12 | 3.19 | 3.67 | 3.03 |
| F3PREPAR Ease with Tech (Mean 21,22,23) | 3.5417 | 3.75 | 3.6875 | 4.0588 |
| Q21 Comfort Ed Aspect ITV | 3.5 | 3.94 | 3.69 | 3.63 |
| Q22 Comfort Tech Aspect ITV | 2.75 | 3.44 | 3.19 | 3.63 |
| Q23 Fax Important | 4.37 | 3.87 | 4.2 | 4.71 |
| F4STUDY Student Study (Mean 12R,19R,20R) | 3.4583 | 3 | 3.0521 | 3.6198 |
| Q12 ITV more Study (recode) | 3.75 | 3.06 | 3.47 | 3.62 |
| Q19 R-ITV More Difficult | 3.25 | 2.5 | 2.5 | 3.38 |
| Q20 R-More Study/Prep ITV | 3.38 | 3.44 | 3.5 | 3.79 |
| F5REMOTE Visit/Know Remote (mean q4R,q5R,q7,q9,q13) | 3.425 | 3.15 | 3.3344 | 3.5091 |
| Q4 Transfer Materials (recode) | 2.62 | 2.44 | 3.12 | 3.41 |
| Q5 R Limit ITV Grade | 4.57 | 3.31 | 3.21 | 3.9 |
| Q7 Support remote=home | 3.62 | 3.56 | 3.87 | 3.36 |
| Q9 Time to Visit Remote | 2.75 | 2.63 | 3.07 | 2.43 |
| Q13 Know Remote Stud | 3.86 | 3.81 | 3.5 | 3.57 |
| F6SUPPOR Support (mean 28,29,30,31) | 4.0938 | 3.526 | 3.5521 | 3.6536 |
| Q28 Support Remote Prin | 4 | 3 | 3.33 | 3.45 |
| Q29 Support Remote Facil | 3.88 | 3.73 | 3.69 | 3.84 |
| Q30 Support Proj Director | 4.71 | 3.71 | 3.6 | 3.76 |
| Q31 Gen Support for Activ | 4.13 | 3.5 | 3.5 | 3.5 |
| F7ENVIRO Environment (mean 2,3) | 4.375 | 4.375 | 4.1562 | 4.2424 |
| Q2 Amt Desk Space | 4.37 | 4.12 | 3.87 | 3.97 |
| Q3 Clear sight TV | 4.37 | 4.62 | 4.44 | 4.52 |
| F8ITV Program Eval (mean 14,17) | 4.375 | 3.8125 | 3.8438 | 3.8382 |
| Q14 ITV Good Addition Curric | 4.25 | 3.5 | 3.5 | 3.55 |
| Q17 ITV Good Way Offer Class | 4.5 | 4.13 | 4.19 | 4.18 |
| F9STUBEH Student Behav (Mean 6,11) | 3.75 | 3.0312 | 3.4375 | 3.3333 |
| Q6 Good Stud Interaction | 4.25 | 3.33 | 3.63 | 3.42 |
| Q11 Better Listener | 3.25 | 2.81 | 3.25 | 3.22 |
| F10STUEN Students enjoy (Mean 24,25) | 4.1875 | 3.7187 | 3.4687 | 3.4375 |
| Q24 Home Site Stud Enjoy | 4.37 | 4 | 3.5 | 3.47 |
| Q25 Remote Site Stud Enjoy | 4 | 3.4 | 3.44 | 3.42 |
| Q27 Make Changes Next YR | 4.25 | 4.06 | 3.62 | 3.72 |
| Q32 Amount Prep Time | 4.75 | 4.87 | 4.38 | 4.63 |
| Q33 Amount Learning | 3.75 | 4.06 | 3.62 | 3.63 |
| Q34 Stud Time-On-Task | 3.75 | 3.94 | 4 | 3.79 |
| Q35 ITV Change Method Teach | 4.43 | 4.25 | 4.27 | 4.58 |

Figure 1

## Teacher Respondents 1995-98
### by Semester

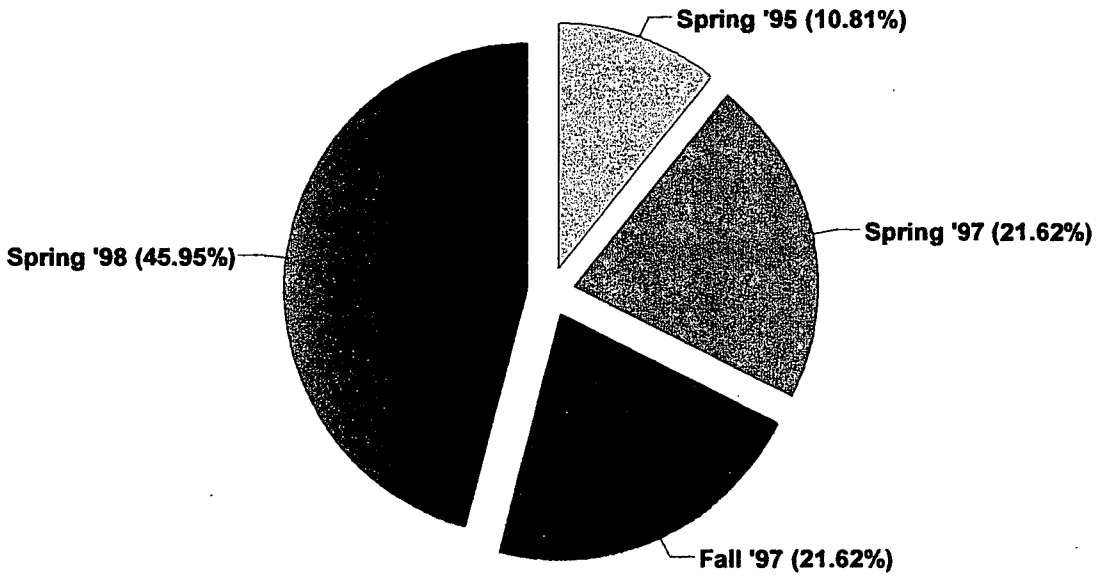



Figure 2

## Support
### Teachers by Semester (95-98)

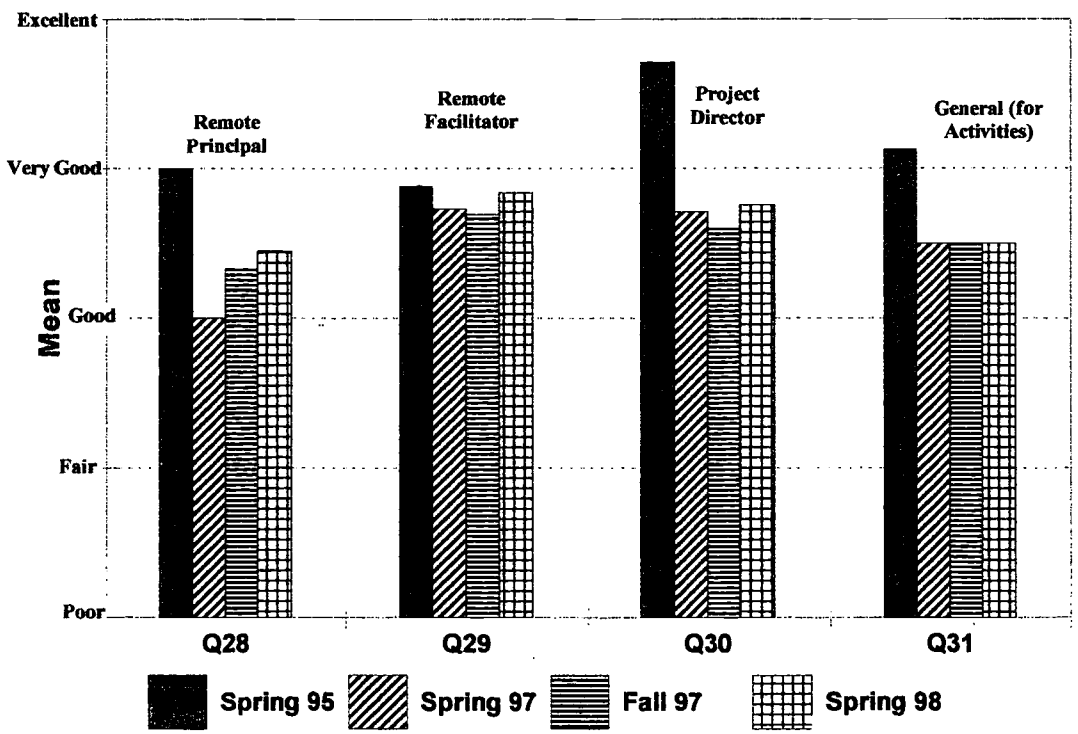


Figure 3

# Teaching Factors

## Teachers by Semester

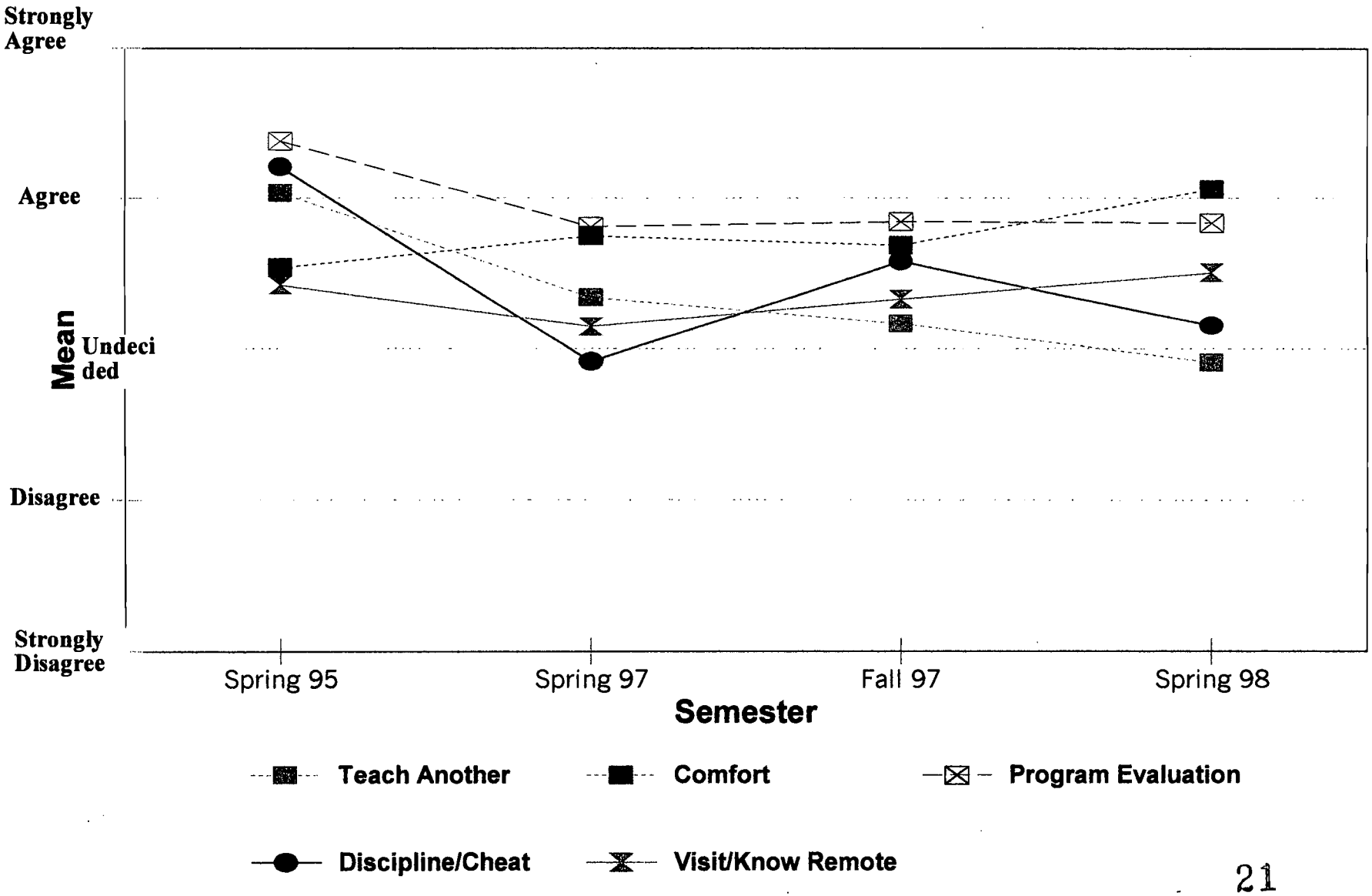


Figure 4

## Comfort with ITV Teaching

Teachers by Semester (95-98)

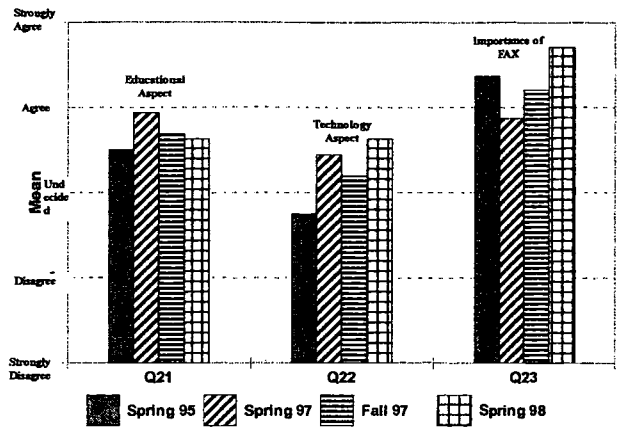



Figure 5

## ITV Program Evaluation

Teachers by Semester (95-98)

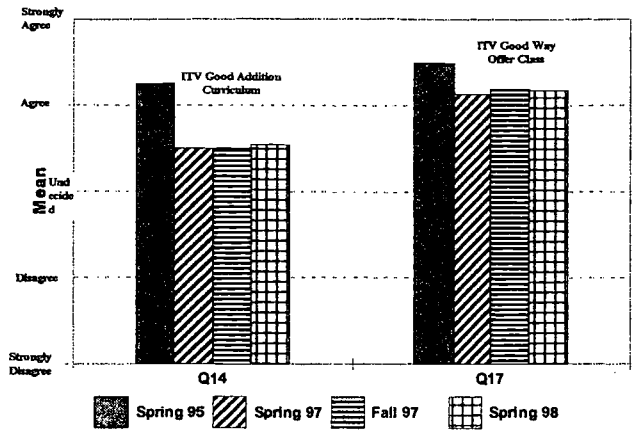



Figure 6

## Teach Another ITV Class

Teachers by Semester (95-98)

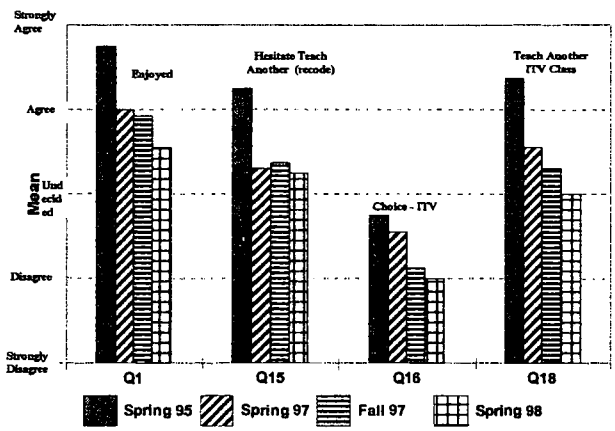



Figure 7

## Discipline - Cheating

Teachers by Semester (95-98)

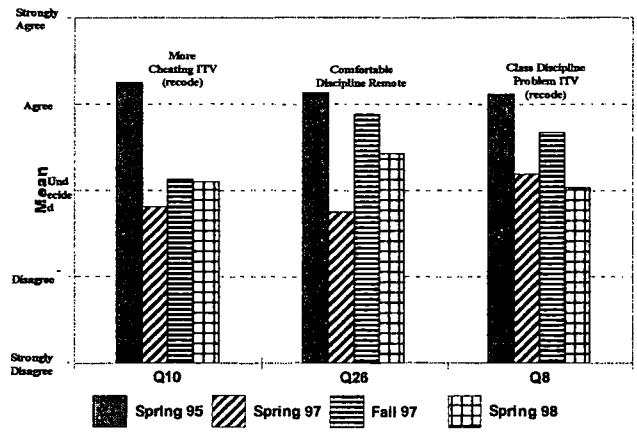



Figure 8

## Visit/Know Remote Students

Teachers by Semester (95-98)

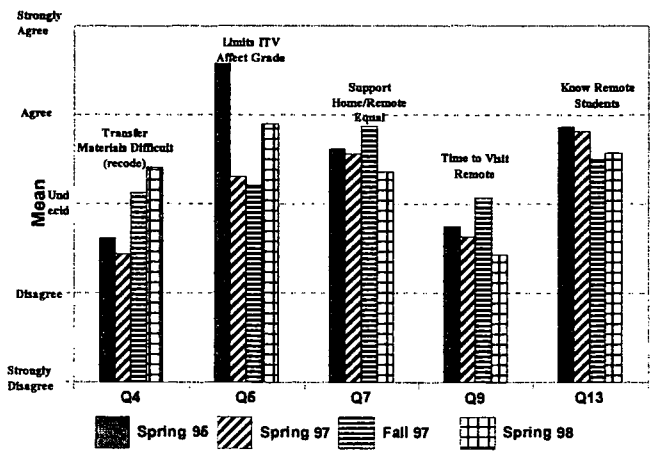
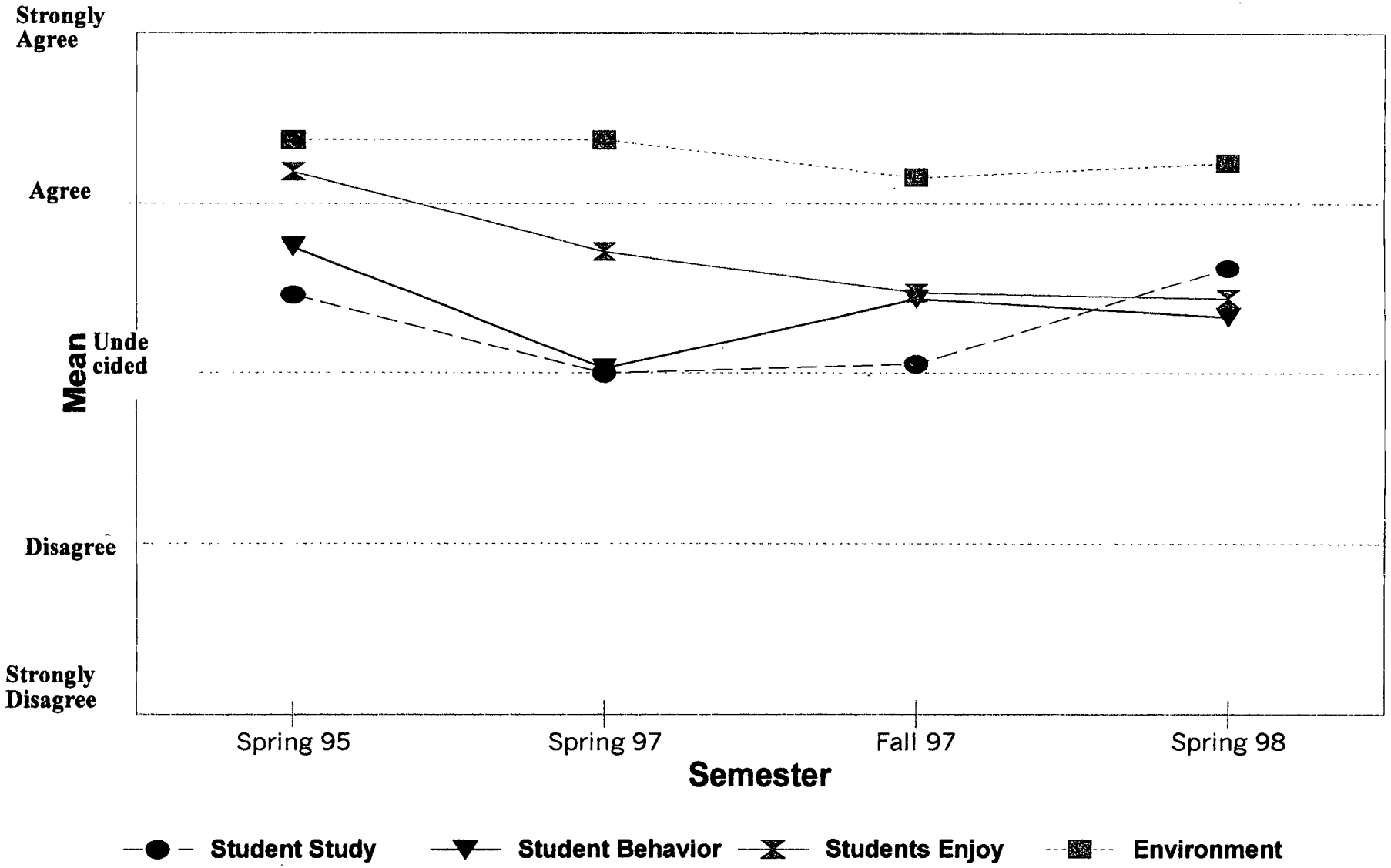


Figure 9

# Student Factors

## Teachers by Semester



gure 10

## Student Study

**Teachers by Semester (95-98)**

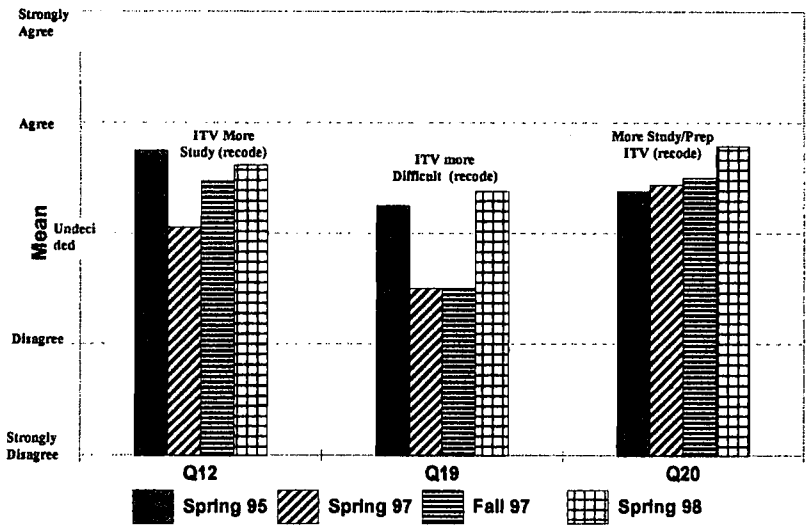



Figure 11

## Environment

**Teachers by Semester (95-98)**

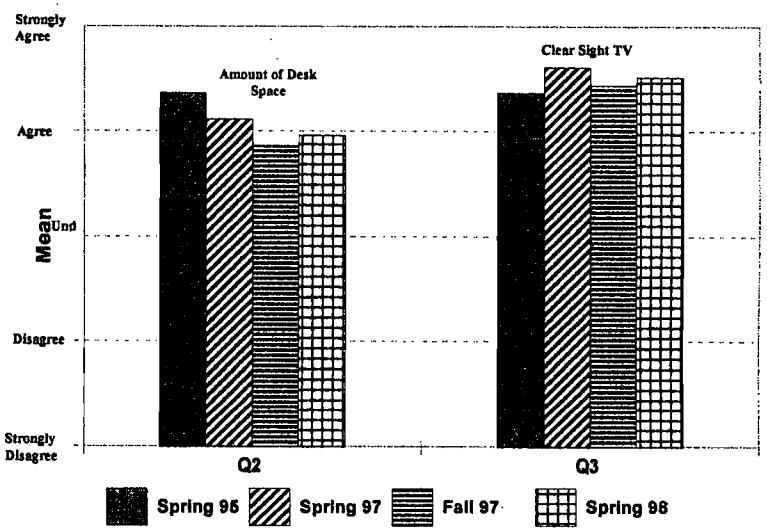



Figure 12

## Students Enjoy

**Teachers by Semester (95-98)**

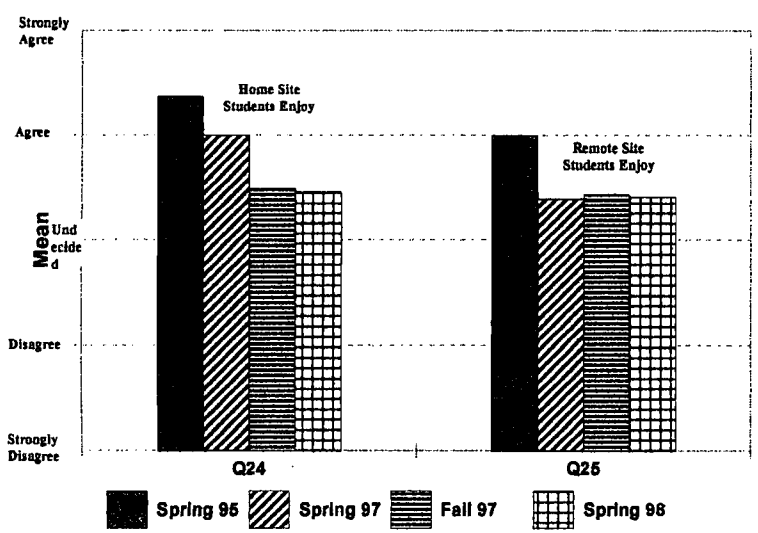



Figure 13

## Student Behavior

**Teachers by Semester (95-98)**

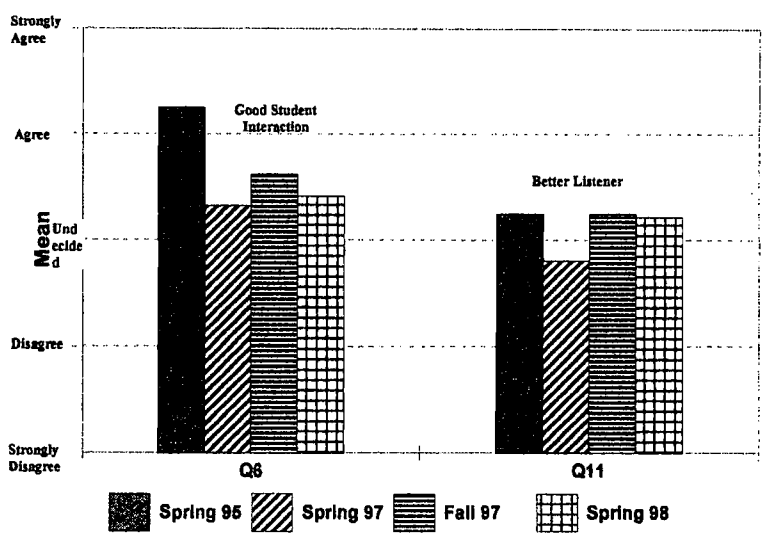
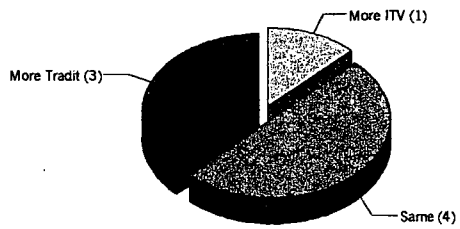


Figure 14

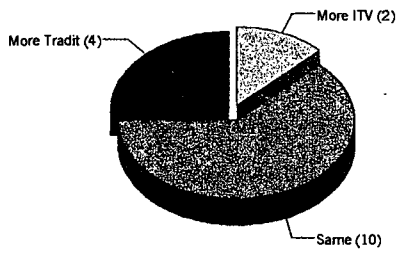
# Student Time-on-Task

## Teachers by Semester (95-98)

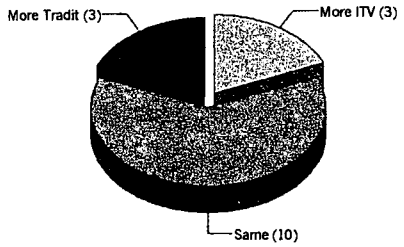
Spring 95
Teachers by Semester (95-98)




Spring 97
Teachers by Semester (95-98)




Fall 97
Teachers by Semester (95-98)




Spring 98
Teachers by Semester (95-98)

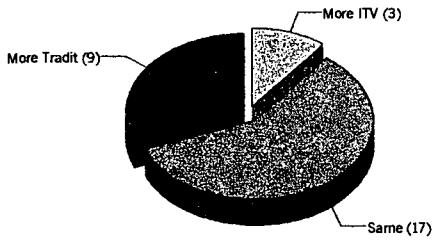
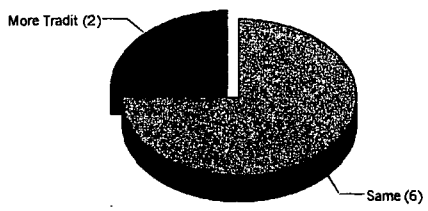



Figure 15

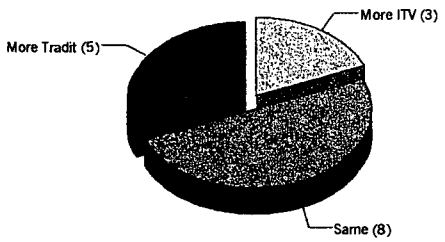
# Amount of Learning

## Teachers by Semester (95-98)

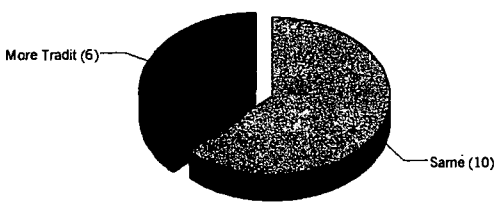
Spring 95
Teachers by Semester (95-98)




Spring 97
Teachers by Semester (95-98)




Fall 97
Teachers by Semester (95-98)




Spring 98
Teachers by Semester (95-98)

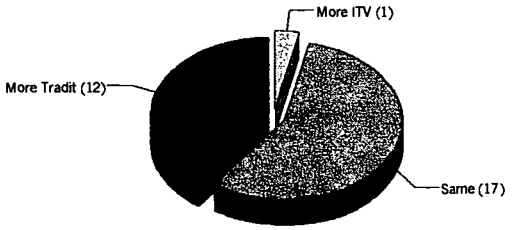


Figure 16

## Make Changes Next Time

**Teachers by Semester (95-98)**

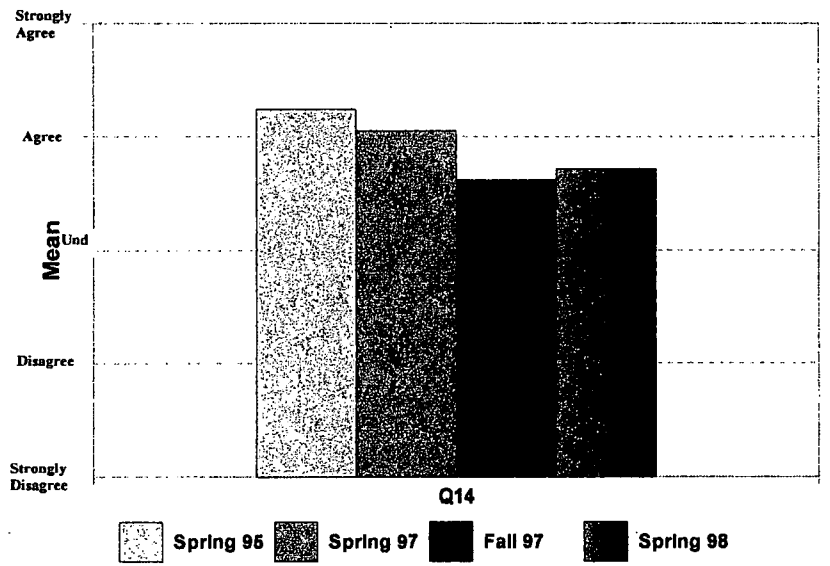



Figure 17

## Change Teaching Style for ITV

**Teachers by Semester (95-98)**

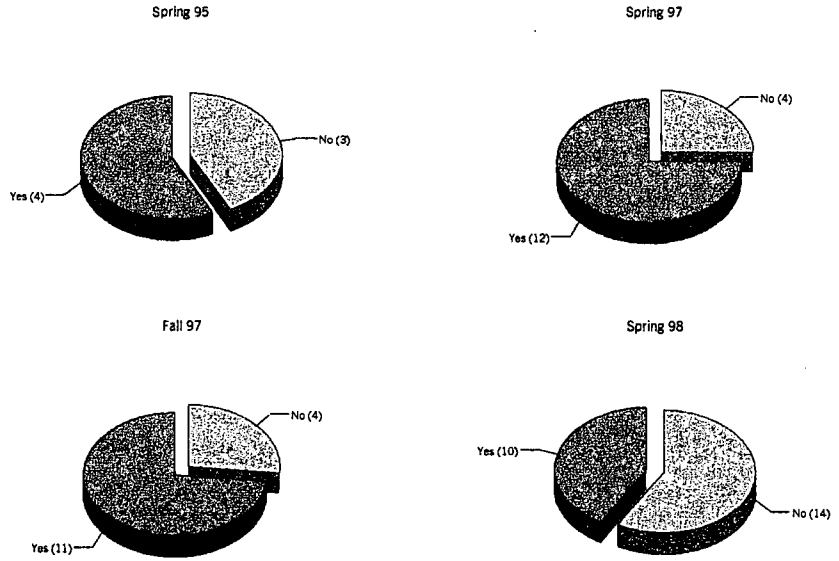



Figure 18

## How Teaching has Changed

**Teachers (95-98)**

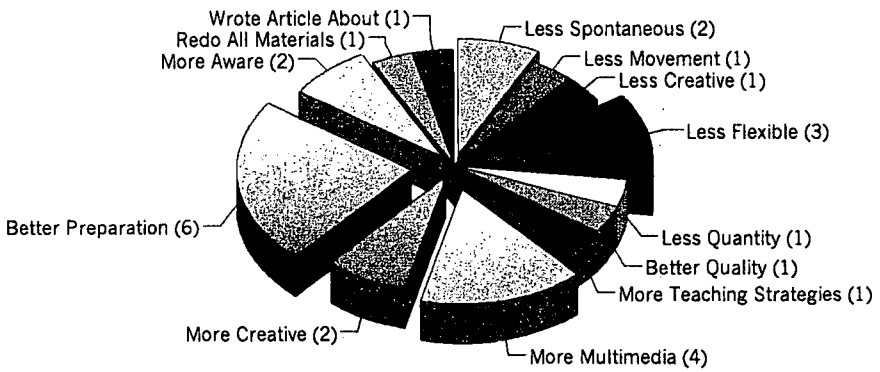





Figure 19

## Amount of Preparation Time

**Teachers by Semester (95-98)**

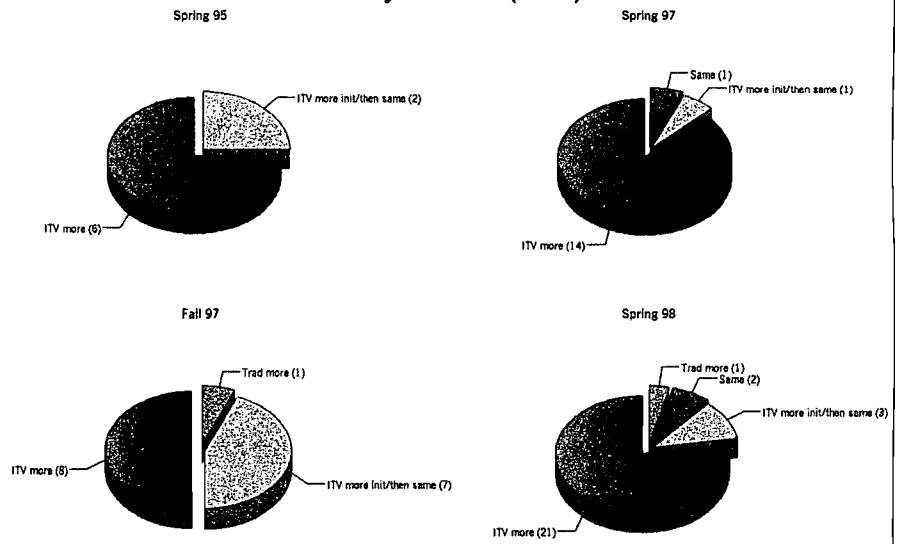
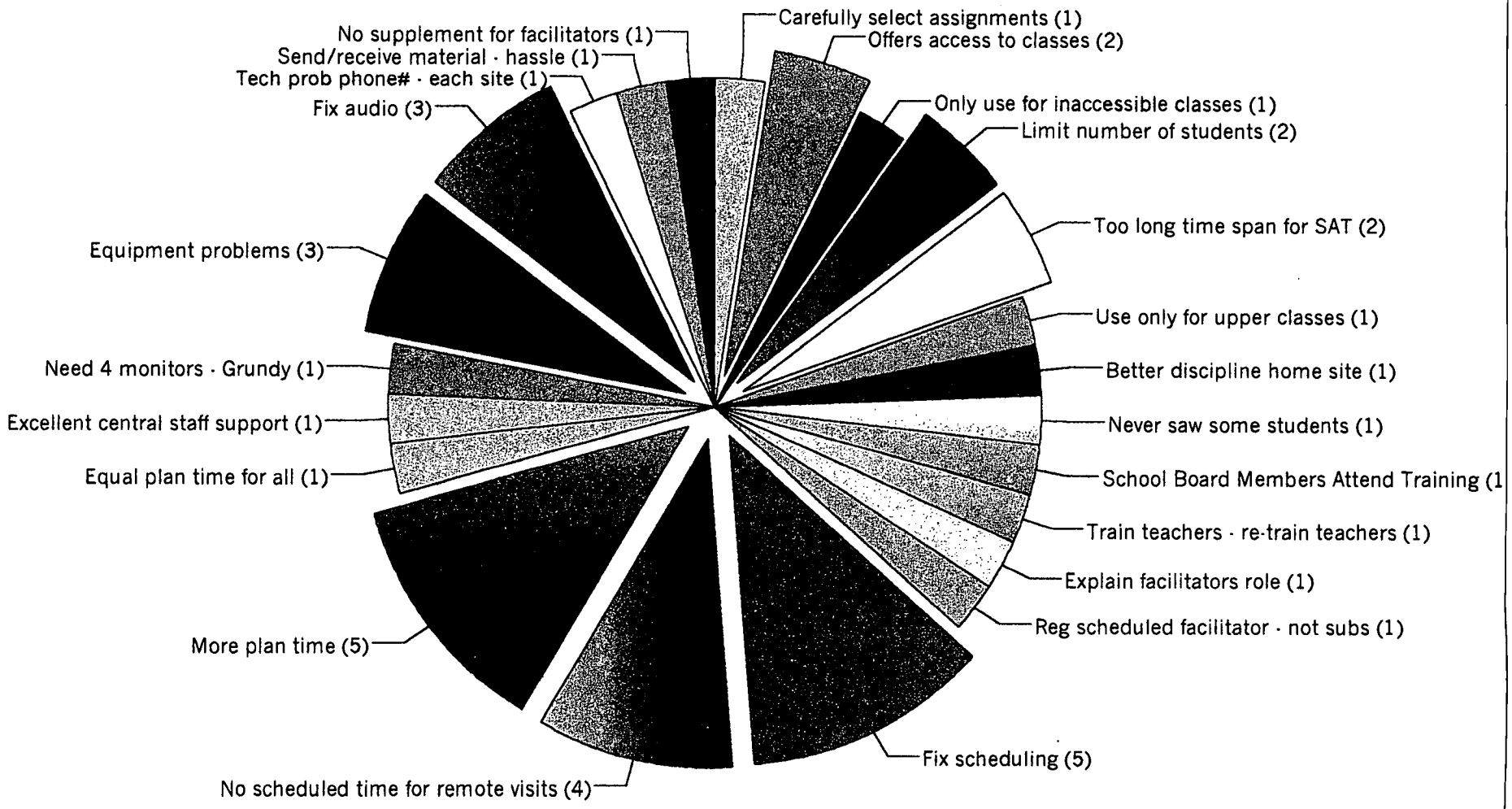


Figure 20

# Comments

## Teachers (95-98)



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