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ON-CAMPUS AND OFF-CAMPUS STUDENTS' RATINGS OF INSTRUCTION AND COURSES

by

Noriko Saeki

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Psychology
(Research and Evaluation Methodology)

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

2003

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ABSTRACT

On-Campus and Off-Campus Students' Ratings of
Instruction and Courses

by

Noriko Saeki, Doctor of Philosophy

Utah State University, 2003

Co-Major Professors: Dr. Byron R. Burnham
Dr. James P. Shaver
Department: Psychology

The associations of student ratings of instruction and courses (SRIC) with noninstructional variables (e.g., class size, expected grade) were examined in three instructional delivery groups—on-campus, off-campus face-to-face, and distance education courses. Factor analysis of SRIC from a 20-item form yielded two highly correlated factors, which differed somewhat across the groups ("Course" and "Instruction"; "Course/Instruction" and "Interaction Opportunities/Instructor Availability"; "Course/Instruction" and "Interaction Opportunities/Helpfulness"). The only educationally significant ($r^2 \geq .05$) zero-order correlations were between SRIC total scores and expected grade, and were positive in all three groups ($r^2 = .07, .08, .06$). In multiple regression analyses, 9%, 11%, and 15% of the variance in SRIC for the three groups was explained by the entire set of noninstructional variables. Unique indices were

consistent with the finding that expected grade was the only noninstructional variable with an educationally significant relationship with SRIC.

In a separate study, SRIC and the instructor's social presence in host- and remote-site groups were investigated. Remote-site students rated course management lower, on average, than host-site students did, and educationally significant, positive relationships were found between social presence scores and the ratings on four SRIC categories. In addition, remote-site students at smaller sites tended to rate instruction and course satisfaction, as well as the instructor's social presence, higher than students at larger sites.

In an additional investigation, students' ratings of teacher immediacy and reports of teacher-student interaction in distance education courses were analyzed. Host-site students tended to rate teacher immediacy higher than remote-site students did, and the negative association of site size with nonverbal teacher immediacy scores was educationally significant for host sites. Host-site students also tended to report more interaction with their instructors than remote-site students did, and mean reported interaction with the instructor was associated positively with site size and ratings of teacher immediacy.

Based on the differing SRIC factorial structures for on-campus and off-campus students, the identification of distance-education-specific noninstructional variables, problems with obtaining SRIC from students in on-line courses, and evidence on the noninstructional-variable-related theory of teacher immediacy, suggestions were made for future research on student satisfaction and perceptions of teaching effectiveness in distance education.

(235 pages)

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Noriko Saeki

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GLOSSARY

Some central terms used frequently in the following chapters are defined in this glossary to ensure a common understanding. The terms are arranged conceptually, not in alphabetical order.

Student ratings of instruction and courses (SRIC)—student evaluations of teaching effectiveness and courses using rating forms. SRIC is a general concept and does not refer to any specific rating form. See page 4 for a detailed discussion of the SRIC definition.

Noninstructional variables—variables that are not part of classroom teaching behavior but might be associated with SRIC. Researchers have used various terms for these noninstructional variables, including bias factors, extraneous factors, and extraneous or intervening variables. Noninstructional variables for this study are class size (SIZE), course level (LEVEL), course content area (college, COL), current (cumulative) grade point average (GPA), expected grade (GRADE), student prior interest (PRIOR), student year (YEAR), and whether the course is for a major (MAJOR), general education (GENERAL), or an elective (ELECTIVE). For distance education courses, three additional noninstructional variables were used: host site or remote site (HOST), EDNET or satellite course (SAT), and site size (SITE). (Also see Table 7, p. 70.)

On-campus courses—courses taught on the main campus. They are called traditional face-to-face courses in some research reports.

Off-campus courses—courses that are taught to students who are usually away from the main campus. At Utah State University (USU), off-campus refers to distance education courses and to off-campus face-to-face courses (see Figure 1).

Distance education courses—courses in which the instructor is not usually at the same site with the student (i.e., remote sites). The host site, where the instructor teaches students, is the exception.

Host site—teaching location for off-campus distance education courses where the instruction originates for transmission to remote sites. Students are also physically present in a classroom. Therefore, the students at host sites do not purely meet the distance education definition.

Remote site—off-campus distance education location where students receive their instruction through electronic instructional technology. The majority of distance education students take courses at remote sites.

Delivery systems—instructional systems that include not only electronic technology-based delivery, such as satellite, EDNET (microwave delivery), and on-line (web-based internet) delivery, but also face-to-face course delivery.

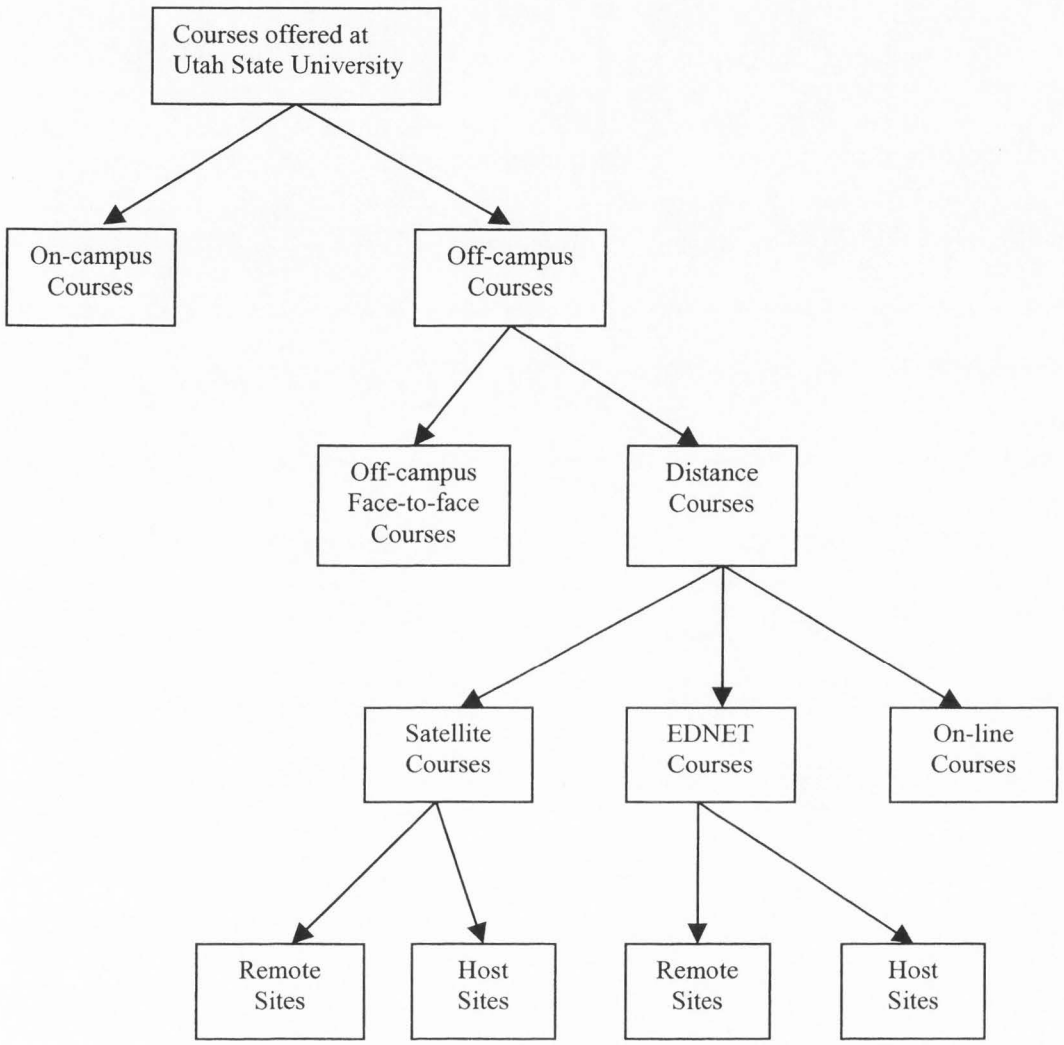

Figure 1. Structure of instructional delivery systems at USU in 2000.

CHAPTER I

INTRODUCTION

With recent technological advances, various systems for distance education delivery in higher education have been developed in the last two decades, including satellite- and microwave-televised instructional systems (Institute for Higher Education Policy, 1999). The uses of on-line systems are also growing rapidly. As with many other universities, Utah State University (USU) has utilized several electronic technology-based delivery systems for distance education. Concurrently, the number of distance education courses has increased, with a 25% increase in student enrollment in the last 2 or 3 years (Utah State University Extension, 1999; Utah State University Distance Education, 2000a).

At the same time, instructors have wondered about their teaching effectiveness and students' satisfaction in distance education courses because student ratings of instruction and courses (SRIC) have sometimes been unexpectedly low. Even when the content and methodology are similar in on-campus and off-campus face-to-face courses, it is not unusual for instructors to receive lower SRIC scores in distance education courses.

There are two main differences between on-campus and distance education courses that might explain these lower SRIC scores. First, distance education instructors are usually physically separated from their students and must communicate through electronic media. Second, most distance education students have fewer classmates at

each class site than do on-campus students, which could be related to student satisfaction with teaching effectiveness.

In order to investigate teaching effectiveness and students' satisfaction, student ratings of instruction and courses (SRIC) have often been utilized and many studies have been conducted for on-campus courses. For example, many researchers have investigated the structure of SRIC (e.g., the multidimensionality of ratings) and the relationships of noninstructional variables to SRIC for on-campus courses. On the structure-of-SRIC research, Marsh (1982) found nine SRIC dimensions: learning/value, enthusiasm, group interaction, organization, breadth of coverage, workload, assignments, exams/grades, and individual rapport. Frey (1978) found a simpler structure, with two factors that he called "pedagogical skill" and "rapport."

A common finding in studies of noninstructional variables is that student expected grade is positively related to SRIC (Greenwald & Gillmore, 1997). Other variables that have been found to be associated with SRIC include class size, course content, and student year (Cashin, 1992; Cashin & Downey, 1992; Feldman, 1978; Kulik & Kulik, 1974; McKeachie, 1979; Murray, Rushton, & Paunonen, 1990). However, these studies were conducted with on-campus courses.

Are the SRIC findings from on-campus courses the same as findings from distance education courses? Spooner, Jordan, Algozzine, and Spooner (1999) have conducted a study of SRIC with on-campus courses and host/remote groups in distance education courses to investigate whether there were any differences on SRIC between (a) on-campus and distance education courses, or (b) host- and remote-sites. Even though

they reported that there were no statistically significant differences in SRIC between on-campus and distance education courses, or between host sites and remote sites in distance education, based on my calculations (see Review of Literature, p. 32), there were educationally significant differences between the host and remote sites. However, the sample sizes were extremely small and instructor and course differences are likely causes of the site differences.

In addition, no study has been located that extended the research of Spooner et al. (1999) in an examination of the association of SRIC with noninstructional variables in distance education courses. Furthermore, no report of the factorial structure of SRIC in distance education courses was located.

Some noninstructional variables present in distance-education courses are not present in on-campus courses (e.g., host and remote sites, site size, and type of electronic technology-based delivery system). However, no report could be located of research on the relations of these distance-education-specific noninstructional variables to SRIC.

Fortunately for research purposes, at USU the SRIC instrument for off-campus courses (including distance education) is the same as that used for on-campus courses. Therefore, it is possible to investigate whether noninstructional variables have similar associations with SRIC in on-campus and off-campus courses.

The purpose of this study was to determine whether (a) off-campus SRIC and (b) the associations of SRIC with noninstructional variables are different from those for on-campus courses. In the following literature review, research on SRIC and distance education courses in higher education are examined.

CHAPTER II

REVIEW OF LITERATURE

Student Ratings of Instruction and Courses

Enormous amounts of research have been done on student ratings of instruction and courses (SRIC). According to Cashin (1995), there have been more than 1,500 articles and books written about the research on student ratings.

There are also many designations for the ratings: McKeachie (1997) simply called them student ratings; d'Apollonia and Abrami (1997), El-Hassan (1995), and Greenwald (1997) termed them student ratings of instruction; Marsh (1983, 1984, 1987), Marsh and Dunkin (1992), and Marsh and Roche (1997) named them students' evaluations of teaching effectiveness (SET). Cashin (1995) discussed this issue as follows:

> The ERIC descriptor for student ratings is "student evaluation of teacher performance." I suggest that the term "student ratings" is preferable to "student evaluations." "Evaluation" has a definitive and terminal connotation; it suggests that we have an answer. "Rating" implies that we have data, which need to be interpreted. Using the term "rating" rather than "evaluation" helps to distinguish between the people who provide the information (source of data) and the people who interpret it in combination with other sources of data (evaluators). (para. 3)

In order to avoid confusion with the many ways of designating student ratings, hereinafter they are referred to as student ratings of instruction and courses (SRIC), unless a different designation is specified by an author.

History

According to McKeachie (1957, 1986), the use of formal SRIC began in the early 1920s. One of the first universities at which student ratings were collected was Harvard

University, where students published a book reporting student opinions on courses and instructors. Within the next 30 years, by the late 1950s, 40% of American colleges and universities had begun to utilize SRIC on at least an annual basis (McKeachie, 1957).

In 1970-80, the number of research reports on SRIC peaked; many studies were conducted on the validity of SRIC (Greenwald, 1997). According to Greenwald, the focus was on three types of validity: convergent validity as, "how well do ratings correlate with other indicators of effective teaching?"; discriminant validity as, "are ratings influenced by factors other than teaching effectiveness?"; and consequential validity as, "are ratings used effectively in personnel development and evaluation?" (p. 1182).

Howard, Conway, and Maxwell (1985) also discussed the validity of SRIC as "Convergent validity, which is demonstrated when different methods of measuring on the same trait are correlated with one another" (p. 191). On discriminant validity, they said, "To justify the use of various measures of teacher effectiveness, as well as to establish construct validity, discriminant validity had to be demonstrated in addition to convergent validity" (p. 193).

Howard et al. (1985) reviewed the literature on SRIC validity and concluded that SRIC have been generally accepted as a valid and useful source of information about teaching effectiveness. They also studied the correlations among teaching-effectiveness ratings by instructors themselves, colleagues, trained observers, former students, and current students in order to find out whether SRIC were as valid as other ratings and which teaching-effectiveness raters produced the most valid ratings. Forty-three

volunteer instructors from eight departments (English, history, mathematics, languages, philosophy, psychology, sociology, and business) were the subjects. They found that "former-students and student ratings evidence substantially greater validity coefficients of teaching effectiveness" (Howard et al., p. 195) than ratings by the instructors themselves, colleagues, and trained observers.

By the 1990s, Murray et al. (1990) stated, "Student ratings have gained widespread acceptance over the past 20 years as a measure of teaching effectiveness in North American colleges and universities" (p. 250). Braskamp and Ory (1994) reported that 100% of large research universities reported the systematic collection of SRIC in the early 1990s and that approximately 86% of 600 liberal arts colleges conducted SRIC and used the results in regular university procedures, such as faculty tenure reviews.

Purposes of SRIC

Generally, SRIC are used by people from three populations: instructors themselves, administrators, and students (Overall & Marsh, 1979). Braskamp and Ory (1994) observed, "Initially, collecting student opinions was a student activity aimed at helping students make better course selections. Currently, student ratings are widely used by faculty to improve their teaching and courses and by administration to make personnel and program decisions" (pp. 173-174). However, Cashin (1995) cautioned that SRIC should be used only as one source of data about teaching effectiveness for faculty evaluation, including promotion and tenure decisions by administration. He explained as follows:

> [S]tudent ratings are only one source of data about teaching and must be used in combination with multiple sources of data if one wishes to make a judgment

> about all of the components of college teaching. Further, student ratings are data that must be interpreted. We should not confuse a source of data with the evaluators who use student rating data—in conjunction with other kinds of data—to make their judgments about an instructor's teaching effectiveness. (Conclusion section, para. 1)

As mentioned, SRIC need to be interpreted and final judgments of teaching effectiveness should involve other sources of data as well.

Multidimensionality of SRIC

Most researchers have agreed that SRIC have multiple dimensions, corresponding to various instructional dimensions. Table 1 contains a summary of research reports on SRIC dimensions. In the table, dimensions are listed that were identified by researchers. Frey (1978) and Centra (1993) reviewed existing SRIC multidimensionality studies and concluded that many investigators found "anywhere from two to seven meaningful factors" (Frey, 1978, p. 75), and "typically, five or six emerge from factor analyses" (Centra, 1993, p. 54) of the scores on SRIC forms.

As one of the major multidimensionality studies on SRIC, Marsh (1982) conducted a study using 329 courses in the social science college at the University of Southern California. He employed 35 evaluation items from his previous work, which had led to the development of an instrument for student evaluations of educational quality (SEEQ). He conducted a factor analysis using an oblimin factor rotation (an oblique factor rotation) after principal-components analysis with Kaiser normalization. Based on his factor analysis, he identified nine dimensions: learning/value, enthusiasm, group interaction, organization, breadth of coverage, workload, assignments, exams/grades, and

Table 1

Dimensions in SRIC Multidimensionality Research

Dimensions	Braskamp & Ory (1994)	Centra (1993)	Educational Testing Service (1971)[a] in SIR[b]	Feldman (1976)	Frey (1978)	Marsh (1984) in SEEQ	McCallum (1992)[a] in ACE[c]
General evaluation							Yes
Teacher student interaction/rapport	Yes	Yes	Yes			Yes	
Openness to other's opinion				Yes			
Clarity/communication skills	Yes	Yes	Yes	Yes	As skill		
Enthusiasm				Yes		Yes	
Group Interaction/class discussion					As rapport	Yes	
Fairness				Yes			
Stimulation of interest/increased knowledge				Yes	As rapport		
Helpfulness (Personal help)				Yes	As rapport		
Friendliness				Yes			
Course organization and (advanced) planning	Yes	Yes	Yes		As skill	Yes	
Breath of coverage				Yes		Yes	
Textbooks and reading			Yes				Yes
Course difficulty/workload	Yes	Yes	Yes			Yes	Yes
Assignments						Yes	
Grading accuracy and examinations	Yes	Yes	Yes		As rapport	Yes	
Student-self-rated learning	Yes	Yes				Yes	
Hard work					As skill		
Critical thinking							Yes
Written work							Yes

[a]Cited in Braskamp & Ory (1994). [b]Multidimensionality in Student Instructional Report. [c]Multidimensionality in Augustana College Evaluation.

individual rapport (Table 1). The eigenvalues for the nine unrotated factors were 19.9, 3.3, 2.3, 1.5, 1.2, .9, .7, .6, and .5, and the factors accounted for 88% of the total variance.

A similar result was found by Centra (1993), who identified six dimensions of SRIC. Based on his previous work and review of other researchers' work, he listed clarity/communication skills, teacher-student interaction/rapport, course organization and planning/structure, student self-rated learning, course difficulty/workload, and grading and examinations. Braskamp and Ory (1994) agreed with Centra's categories and listed the six dimensions in their book. Feldman (1989) categorized 28 specific dimensions of SRIC from many different SRIC forms after a review of studies.

On the other hand, Frey (1978) found only two global factors, pedagogical skill and rapport in the scores for seven items on the Endeavor Instructional Rating Card. The 7-item form was extracted from a 21-item form, which was originally developed by him in 1973, using factor analysis. He dropped 14 items because his research indicated that the 7-item form "retains the validity and reliability characteristics of the longer form" (Frey, 1978, p. 76), students complained that the 21-item form was too long, and the 7-item form could be printed on a single computer card.

Frey's (1978) seven-item form contains:

1. The student had to work hard in this course (Hard Work).
2. Each class period was carefully planned in advance (Advanced Planning).
3. Class discussion was welcome in this course (Class Discussion).
4. The student was able to get personal help in this course (Personal Help).
5. The instructor presented the material clearly and summarized major points (Presentation Clarity).

6. The grading accurately reflected the student's performance (Grading Accuracy).

7. This course has increased my knowledge and competence in this area (Increased Knowledge).

The seven items are listed in Table 1 as SRIC dimensions, and also categorized "as (pedagogical) skill" or "as rapport." In Frey's (1978) research, students in different classes taught in two consecutive quarters (fall and winter quarters) received the 7-item forms in the mail after they had received their final grade. The return rates were 62% for fall quarter, and 55% for the winter quarter. Totally, 26,787 forms were returned from 1,298 courses.

Frey (1978) conducted a principal component factor analysis and Varimax rotation (orthogonal rotation) on his seven-item form, and two global factors were identified: A Skill factor included the items on Advanced Planning, Presentation Clarity, and Increased Knowledge; a Rapport factor included items of Personal Help, Grading Accuracy, and Class Discussion (see Table 1). He found that the two factors accounted for 75% and 77% of the total variance for the Fall quarter data and the Spring quarter data, respectively.

Even though Frey (1978) listed the Grading Accuracy item on the Rapport factor, Grading Accuracy was loaded on both factors almost equally: it was loaded .55 on Skill and .61 on Rapport, while other items were loaded more on one factor and much less on the other. For example, Class Discussion was loaded less than .05 on Skill as opposed to more than .80 on Rapport. Because the Grading Accuracy loading pattern was not as obvious as other items, Grading Accuracy may not have been appropriately included in

the Rapport factor. Furthermore, his study was conducted as a mail survey, which is not the usual SRIC procedure. Because students had received their course grades, the grading accuracy results might be different than they would have been if the students had completed the form before the end of their course.

Researchers have also investigated the usefulness of global student ratings, instead of multiple items, for summative evaluations for administrative uses. Cashin and Downey (1992) argued as follows:

> One of the continuing debates concerning the use of student ratings of teaching is the debate revolving around what kind of measures should be used for [the] summative evaluation of faculty, in making personnel decisions for retention, promotion, tenure, or salary increases, and of course, to assess their effectiveness. Can one validly use a single item or index number for such decisions, or must one use multiple ratings? (p. 563)

The authors found that two global items, one of which dealt with the instructor and the other with the course, accounted for more than 50% of the variance in a weighted-composite criterion measure. Based on this result, they suggested that "because global items accounted for a substantial amount of the variance, a short and economical form could capture much of the information needed for summative evaluation and longer forms could be reserved for teaching improvement" (p. 563).

Common Formats for Collecting SRIC

SRIC scores have been obtained using several formats differing in purpose and in style. Three common formats are omnibus, goal-based, and cafeteria system/menu-type (Braskamp & Ory, 1994).

The omnibus format contains a fixed set of items that is used for all departments, colleges, or campuses. Because the form is standard, it is possible to make comparisons across courses and instructors.

With the goal-based format, "students rate their own performance or progress on stated course goals and objectives–such as gaining factual knowledge, developing special skills and competencies, and developing appreciation for subject matter–rather than rate the performance of their professor" (Braskamp & Ory, 1994, p. 175). The Instructional Development and Effectiveness Assessment (IDEA), one widely used faculty assessment, is a goal-based format developed by the Center for Faculty Evaluation and Development at Kansas State University.

The cafeteria format provides a bank of items (different style, but calling for ratings of the instructor, as with the omnibus SRIC format). Instructors can select items from this bank, but they must include some campus-wide items. Purdue University developed this system in the early 1970s. Now, for example, the University of Hawaii-Manoa campus has an on-line system that allows faculty to submit their choices of SRIC items. The evaluation form is called "CAFÉ (A Course and Faculty Evaluation for UH Manoa)." University of Hawaii–Manoa (University of Hawaii, 1999) staff explained it as follows:

> The system provides for customizing of the evaluation questionnaire by the faculty or department combined with common elements for assessing the campus as a whole. This can be especially useful when a course of instruction does not fall in the traditional instructional mode, or a new, innovative method/technique is in experimental use. (¶ 2)

On the home page for CAFÉ (University of Hawaii, 1999), all of the evaluation items from which faculty can select are listed. The faculty member chooses evaluation

items from the list and submits the selection electronically to a university office. The preparation and submission of the SRIC instrument to the university administration is more convenient for instructors than with a paper form of a cafeteria format.

One commonly utilized SRIC system, developed by the Office of Educational Assessment at the University of Washington, is called the Instructional Assessment System (IAS; University of Washington, 1998). The IAS can be categorized as partly omnibus and partly cafeteria system, because there are 11 forms from which each instructor can choose, and each form contains a fixed set of items. The original form was implemented in the 1920s, and an improved version was published in 1974. In 1995, the IAS was upgraded for use with a major programming system, database engine, and report generators. The IAS is used in more than 11,000 courses annually at the University of Washington, and more than 30 other higher education institutions have utilized the IAS (University of Washington, 1998).

The 11 IAS forms were developed for use in different types of courses. Each form consists of a two-sided page. On the front of the form, there are machine-readable responses and on the back of the form there are open-ended, instructor-generated items. The 11 forms are labeled Form A through J, and Form X: Form A is for small lecture/discussion courses; Form B is for large lecture classes; Form C is for seminar discussion classes; Form D is for those classes for which the purpose of instruction is problem-solving; Form E is for those classes in which instruction is skill oriented and in which students get "hands on" experiences related to future occupational demands; Form F is for quiz sections; Form G is for use in large lecture classes in which instructors rely heavily on homework problems and a textbook; Form H is for lab sections; Form I is for

distance-learning courses; Form J is for clinical experiences, rather than traditional academic coursework; and Form X is for use in all course types. All of the forms have identical backsides, on which individual instructors are able to include items they create.

Open-Ended Student Feedback

Even though a multiple-choice rating scale is the most common format for feedback from students on teaching effectiveness, many universities utilize open-ended questions. According to Braskamp and Ory (1994), student responses to rating scale items, written comments (open-ended questions), and student interviews yield similar results. The authors also discussed the different uses of rating scales and open-ended questions. According to them, instructors rely on open-ended written comments from their students for self-improvement of teaching effectiveness. Kimlicka (1982) also claimed that, for instructors, SRIC responses do not provide adequate feedback to improve instruction. But when the purpose is personnel decisions, administrators regard the written comments as less credible than rating-scale responses from larger numbers of students.

McKeachie (1986) explained this point well. Because administrators need to evaluate teaching effectiveness university-wide, standard scales and rating-scale responses are more appropriate than open-ended responses that are too detailed and with content too specific for comparison of results.

On the other hand, there are two reasons why instructors prefer open-ended responses for improving teaching. First, a rating scale is not informative enough because it is not content specific. McKeachie explained that "one might prefer such an item as:

'The instructor writes key points on the blackboard,' to an item such as 'Lectures are well organized'" (p. 288). In order to cover the needs of instructors, the cafeteria system, which was explained above, provides "flexibility in obtaining student ratings likely to give the instructor useful information" (p. 289).

Second, McKeachie (1986) pointed out that instructors sometimes do not know how to interpret the results of rating scales for use in improving their teaching. Providing interpretations of the results of SRIC to instructors is a necessary procedure to improve their teaching and to understand student feedback. If rating scale responses are well-analyzed, instructors can use them along with written comments from students for their own self-improvement.

Noninstructional Variables

For on-campus courses, there are a number of studies on the associations of noninstructional variables with SRIC (Cashin, 1990; Greenwald & Gillmore, 1997; Kierstead, D'Agostin, & Dill, 1988; Marsh & Cooper, 1981; Teven & McCroskey, 1996). Also, many authors have summarized previous research on noninstructional variables. For example, in their literature review, reported in *Assessing Faculty Work*, Braskamp and Ory (1994) identified 23 noninstructional variables, which they categorized in five main areas: administration-related, instrumentation-related, instructor-related, nature of course-related, and student-related. Some variables they listed in their analysis were not substantially associated with SRIC. Table 2 is based on a summary of the review by Braskamp and Ory along with findings from over 50 other reports. Using Braskamp and Ory's five categories, noninstructional variables are discussed in the following sections.

Table 2

Noninstructional Variables and Previous Research Findings

Variables	Previous Research Findings
Administration	
Student anonymity	More positive if signed rather than anonymous (Argulewiz & O'Keefe, 1978; Feldman, 1979; Stone, Spool, & Rabinowitz, 1977).
Instructor's presence	More positive if the instructor was in the classroom while ratings were completed (Feldman, 1979).
Explanation	More positive if the stated use was for promotion (Centra, 1976; Feldman, 1979; Overall & Marsh, 1979; Sharon & Bartlett, 1979).
Timing	Lower when administered during final exam rather than regular class (Frey, 1976).
Instrumentation	
Placement of items	Placement of specific items before or after global items strongly related to the global ratings (Ory, 1982).
Categorized/ randomized items	Categorized-items format yielded more reliable ratings (Carey, Dedrick, Carey, & Kushner, 1994).
Number of scale points	Six-point scale yielded more varied responses and higher reliability than five-point scale (Braskamp & Ory, 1994).
Negative wording of items	Numbers of negatively worded items not associated with rating results (Ory, 1982).
Scale labeling	Labeling only end-point on scale yielded slightly higher average ratings (Frisbie & Brandenburg, 1979).

(*table continues*)

Variables	Previous Research Findings
Instructor	
Rank	Professors received higher ratings than TAs (Brandenburg, Slinde, & Batista, 1977; Centra & Creech, 1976; Marsh, 1980).
	Associate professors rated higher and instructors with no graduate degree rated lower (McKeachie, 1957).
	No relationship (Feldman, 1983).
Gender	Women instructors rated slightly higher (Bennett, 1982; Feldman, 1992, 1993; Kierstead et al., 1988; McKeachie, 1957; Wilson & Doyle, 1976).
Age	Older instructors rated lower (McKeachie, 1957).
	No relationship (Feldman, 1983; Kierstead et al., 1988).
Personality	Perceived warmth and enthusiasm positively related to SRIC (Erdle, Murray, & Rushton, 1985; Feldman, 1986; Murray et al., 1990; Teven & McCroskey, 1996).
Years teaching	No relationship (Feldman, 1983).
Research productivity	Minimum relationship (Feldman, 1987).
	No relationship (Aleamoni & Yimer, 1973; Hattie & Marsh, 1996).
	Instructors with published research were rated higher (McKeachie, 1957).
Course	
Class size	Small correlations; smaller classes tended to receive higher ratings (Cashin, 1992; Cashin & Downey, 1992; Chau, 1997; Feldman, 1984).
Course level	Higher course levels tended to get higher ratings (Bausell & Bausell, 1979; Feldman, 1978; Marsh, 1987; Marsh & Overall, 1979)
	Varied in studied schools (McKeachie, 1957).
	Curvilinear relationship (Marsh & Dunkin, 1992).

(*table continues*)

Variables	Previous Research Findings
Content area/discipline	From lowest ratings to higher, arts/humanities, biological/social science, business, computer science, math, engineering, physical science (Cashin, 1990, 1992; Feldman, 1978; Kulik & Kulik, 1974; McKeachie, 1979).
Student	
Expected grade	Higher grade expected, higher ratings given (Abrami, Dickens, Perry, & Leventhal, 1980; Feldman, 1976; Greenwald & Gillmore, 1997; Howard & Maxwell, 1980; Peterson & Cooper, 1980; Shin, 1992a).
Prior interest in subject	Higher prior interest, higher ratings (Marsh & Cooper, 1981; Ory, 1980; Perry, Abrami, Leventhal, & Check, 1979; Prave & Baril, 1993).
Undergraduate year	Little difference (McKeachie, 1957).
	Ratings higher in senior than junior year (Feldman, 1978; Murray et al., 1990).
Undergraduate/graduate	Grad student ratings higher than undergrads (McKeachie, 1957)
Major/minor	Majors tended to rate higher (Feldman, 1978)
Required/elective	Elective course ratings were higher than required courses (Brandenburg et al., 1977; Costin, Greenough, & Menges, 1971; Marsh, 1984; McKeachie, 1979; Murray et al., 1990).
	Results varied in studies (McKeachie, 1957).
Gender	No relationship, but slightly higher ratings to the instructors of same gender (Basow & Silberg, 1987; Bennett, 1982; Bernard & Keefauver, 1981; Feldman, 1992).
	No relationship (McKeachie, 1957).
Age	No relationship (McKeachie, 1957).
Personality	No meaningful and consistent relationships (Abrami, Perry, & Leventhal, 1982).

SRIC Administration-Related Variables

Administration-related noninstructional variables include student anonymity, instructor's presence, explanation (e.g., how the results will be used), and timing (e.g., on the final exam day or before). However, these variables were reported in the literature a couple of decades ago, and have been controlled in SRIC administration at many universities, including USU.

For example, researchers have found that when students were required to sign ratings, the results were more positive than anonymous ratings (Argulewiz & O'Keefe, 1978; Feldman, 1979; Stone et al., 1977). Also, according to Feldman (1979), SRIC are more positive when the instructor remains in the classroom while his or her students complete their ratings. However, as mentioned earlier, SRIC are now conducted anonymously at many universities (Murray et al., 1990), and instructors are typically not allowed to stay in their classrooms during the process. At USU, inparticular, these administration variables are controlled, so none can be associated with SRIC.

Instrumentation-Related Variables

A shown in Table 2, researchers have studied instrumentation-related variables, such as the placement of items (Ory, 1982), categorized versus randomized items (Carey et al., 1994), number of scale points (Braskamp & Ory, 1994), negative wording of items (Ory, 1982), and scale labeling (Frisbie & Brandenburg, 1979).

According to Carey et al. (1994), when rating items from the same dimension are arranged together on an instrument, the ratings are more reliable than when items are randomly distributed on the instrument. Even though they did not examine how the

format might affect other aspects of students' responses, such as validity, their research showed that an organized format "may be more straightforward, produce less suspicion from the student, and be more time efficient. . ." (p. 144).

In general, the items on SRIC forms are sorted by category (Braskamp & Ory, 1994). Utah State University's rating items are sorted into the categories of General Evaluation, Information about the Course, Information about Instruction, and Information about Students, so that the placement of items is controlled as a noninstructional variable. As with the placement of items, other instrumentation-related variables have been controlled by university's administration. Therefore, the details are not discussed here as possible noninstructional variables in this study.

Instructor-Related Variables

Many researchers have conducted studies of instructor-related noninstructional variables, such as instructor rank (Brandenburg et al., 1977; Centra & Creech, 1976; Marsh, 1980; McKeachie, 1957), gender and age/years of teaching (Bennett, 1982; Feldman, 1992, 1993; Kierstead et al., 1988; McKeachie, 1957; Wilson & Doyle, 1976), personality (Erdle et al., 1985; Feldman, 1986; Murray et al., 1990; Teven & McCroskey, 1996), and research productivity (Aleamoni & Yimer, 1973; Feldman, 1987; Hattie & Marsh, 1996; McKeachie, 1957).

Among these instructor-related variables, more inconsistent research results were found on the research productivity variable than other variables. Hattie and Marsh (1996) conducted a meta-analysis on the relationship between research productivity and teaching. They reviewed 58 studies and found no statistically or educationally significant

relationship (weighted average $r = .06$) between quality of teaching and research productivity. They also compared their results with Feldman's (1987) meta-analysis results. Feldman found an average correlation of .12 in his meta-analysis of 29 studies; however, according to Hattie and Marsh, the weighted average correlation was only .05, when the outliers were excluded. Therefore, research productivity has not proven to be highly related with SRIC.

In general, the results on the other instructor-related variables (e.g., instructor's gender and age) did not appear to indicate important correlates of SRIC (see Table 2).

Course-Related Variables

Research has been conducted on the noninstructional variables of class size (Cashin, 1992; Cashin & Downey, 1992; Chau, 1997; Feldman, 1984), course level (Bausell & Bausell, 1979; Feldman, 1978; Marsh, 1987; Marsh & Dunkin, 1992; Marsh & Overall, 1979; McKeachie, 1957) and content area (Cashin, 1990, 1992; Feldman, 1978; Kulik & Kulik, 1974; McKeachie, 1979) as course-related variables. In the many studies that have been reported, these variables seem to be substantially associated with SRIC.

Class size. The research findings on class size have varied. In the 1950s, McKeachie (1957) concluded that associations between class size and SRIC depended on the universities where the studies were conducted. Later, however, other researchers (Cashin, 1992; Cashin & Downey, 1992; Chau, 1997; Feldman, 1984) found that smaller classes tended to receive higher ratings, but the correlations were low. For example,

Feldman (1984) found a weak negative correlation of -.09 between class size and SRIC, which is not educationally significant (see p. 74).

On the other hand, Marsh and Dunkin (1992) found a "significant" nonlinear relationship between class size and SRIC, with an overall negative relationship. They specified their results and concluded:

> Class size is moderately correlated with Group Interaction and Individual Rapport (negatively, *r*s as large as -.30), but not with other SEEQ dimensions or with the overall ratings of course or instructor. . . . There is also a significant nonlinear component to this relation in which small and very large classes were evaluated more favorably. However, since the majority of class sizes occur in the range where the relation is negative, the overall correlation is negative. (p. 195)

Chau (1997) categorized his sample classes into four groups of 10, 30, 60, and 150 students and also grouped instructors into three levels based on their students' ratings of them on the 7-point scale item, "Overall, as a teacher, this instructor is." The instructors were grouped as "excellent" if their mean score was 6 or 7 points on the item, "average" for 3, 4, or 5 points, and "poor" for 1 or 2 points. He then correlated SRIC and class size for each group. He found that for instructors rated "poor," there was no correlation between class size and SRIC; however, for instructors rated "medium," there was a nonlinear correlation with higher scores for medium-size classes. For instructors rated as "excellent," the nonlinear correlation was reversed: higher scores for small and large classes. However, the results from Chau's study were not educationally significant (see p. 74). His conclusions were derived from statistical significance testing on the means and medians of the groups: the mean difference was at the third decimal point, and the largest effect size (Cohen's *d*) was only .06.

In sum, in their literature review, Braskamp and Ory (1994) and Centra (1993) concluded that class size does not have an educationally significant association with SRIC. Centra summarized, "although the differences (in ratings by class size) are statistically significant, they are not especially large and probably have little practical significance" (p. 67).

Based on the foregoing research, two important areas of investigation are suggested. First, even though little association has been found between class size and SRIC, these research findings come from on-campus courses. There may be different results in distance education courses, because each distance education course has several different sites; in other words, class size is defined by the sum of several site sizes. Site size (rather than class size) may be a variable that has an educationally significant relationship to SRIC, because the number of students in physical proximity to one another at each site is not the same as the class size. Second, class size tends to be confounded with course level, which is discussed below.

Course level. Course level tends to be confounded with class size, and whether courses are required or elective. For example, higher-level courses tend to have smaller classes and are more often required courses than lower-level courses.

Class size and course level were examined in research by Murray et al. (1990). They categorized psychology courses into six types based on class size, student composition, and method of instruction. The six course types were introductory (class size = 200-250, for freshmen, lecture-laboratory courses), general (class size = 150-450, for sophomores and juniors, lecture courses), required honors (class size = 30-60, for sophomores, juniors, and seniors, lecture-laboratory courses), optional junior honors

(class size = 20-60, for sophomores, lecture-discussion-based courses), optional senior honors (class size = 5-25, for junior and senior honors, seminar courses), graduate (class size = 3-15, for graduate students, seminar courses). Murray et al. (1990) found that SRIC varied across the six types of courses. They concluded as follows:

> [I]nstructor effectiveness can vary substantially across different types of courses. In other words, receiving high or low instructional ratings in one type of course is no guarantee that ratings will be similarly high or low in another type of course. Teacher ratings showed much higher consistency across undergraduate course types (mean r = .66) than for undergraduate versus graduate courses types (mean r = .15). . . . This result is consistent with previous evidence that instructor ratings correlate higher across years for the same course than across different courses taught in the same year (e.g., Marsh, 1981). (p. 254)

Feldman (1978) and others (Bausell & Bausell, 1979; Marsh, 1987) also found that ratings in higher-level courses tended to be higher than in lower-level courses. But as mentioned above in the class size discussion, this course level variable could be highly confounded with class size.

Content area/discipline. Another noninstructional variable that may be associated with SRIC is the content area of courses. According to Braskamp and Ory (1994), researchers have found that courses in arts and humanities received higher ratings than those in other content areas. Biological and social sciences were next, followed by business, computer science, math, engineering, and physical sciences. Feldman (1978) also noted in his research review that "humanities, fine arts, and languages tend to receive somewhat higher ratings. The possible reasons for these relationships are many and complex" (p. 199).

Student-Related Variables

In previous research, student gender, age, and personality were not related to SRIC. However, some student-related variables seem to be associated with SRIC. They are expected grade, prior interest in subject, year (freshman, sophomore, etc.), taking courses as a major or a minor (major/minor), and taking courses as a required course or an elective (required/elective).

Expected grade. Several researchers have concluded that students who were expecting high grades in a course gave higher ratings than did students expecting low grades (Abrami et al., 1980; Feldman, 1976; Peterson & Cooper, 1980; Shin, 1992a). As a result, some believed that good ratings are simply representations of grading leniency (Peterson & Cooper). On the other hand, there are those who assert that the association between SRIC and expected grades is neither a "bias" nor a noninstructional variable; possibly, good teachers have successful students. Or possibly there is a relationship between good teaching and students who expect good grades.

Peterson and Cooper (1980) studied whether there is a difference in SRIC between students who expected to get graded and students who have not planned to get graded. They found that ratings of the same teachers ($N = 64$) by graded students agreed moderately with ratings by ungraded students ($r = .52$). Therefore, they concluded, "teacher evaluations were not simply a response to grades, although they were positively associated with them, both within and across teachers" (p. 682).

However, Peterson and Cooper's (1980) research had a limitation. They asked students to report their grades and their evaluations of teachers early in the semester following their courses, so their procedure was not the usual one for obtaining SRIC. By

the time students filled out their evaluations of a teacher, the course was over and they had their posted grades. Usually, students know only their expected grades at the time they rate instructors, not their posted grades. If students receive unexpectedly lower or higher grades than they expected, the SRIC might be affected. Therefore, Peterson and Cooper's research may have yielded different results from the typical investigation of the noninstructional variable of "expected grade."

In summary, even though correlational analyses cannot lead to a conclusion of a causal relationship, expected grade is a potentially fruitful noninstructional variable in the investigation of associations with SRIC.

Prior interest in subject. Several researchers have found that students with prior interest in the subject give higher ratings to their instructors (Marsh, 1980; Marsh & Cooper, 1981; Ory 1980; Perry et al., 1979). As many researchers have agreed, Prave and Baril (1993) wrote, "[S]everal researchers, including Marsh, have found that prior subject interest, that is, initial student motivation, had consistently emerged as one of the most important background characteristics related to student ratings" (p. 362).

Marsh (1980) listed prior interest in a subject as one of the four noninstructional variables most likely to influence SRIC. The other three variables were expected grade, levels of workload/difficulty, and general interest (i.e., as opposed to requirement as major, elective, general education, or minor). According to his multivariate analysis, 12 to 14% of the variance in SRIC could be explained by 16 noninstructional variables that included the 4 most influential noninstructional variables.

As a closer look, Marsh (1980) examined the four most important variables by partitioning out the variance associated with all other background variables. He found

that prior subject interest explained 10.6% of the variance in the overall course ratings, 4.1% of the variance in overall instructor ratings, and 19.5% of the variance in valuable learning experience scores. His results suggested that the noninstructional variable of prior interest might be substantially associated with SRIC.

Student year. Although McKeachie (1957) found that SRIC were not associated with student undergraduate years, later research revealed that ratings were higher for seniors than for juniors (Murray et al., 1990), but the effect size, *d*, was only .20. Feldman (1978) also concluded that the correlation between student year and SRIC was weak. McKeachie (1957) cited Remmers and Elliott's (1949) finding that graduate students gave more positive SRIC ratings than undergraduate students did. However, this result was published more than a half century ago.

Major/minor and required/elective. According to Feldman (1978), students taking courses in their major tended to rate their instructors more positively than students who were nonmajors. On the other hand, other researchers have reported that ratings in elective courses were higher than in required courses (Brandenburg et al., 1977; Costin et al., 1971; Feldman, 1978; Murray et al., 1990). Costin et al. (1971) reviewed others' research and concluded that "Psychology majors were found to rate courses and instructors about the same as nonpsychology majors, although students required to take a psychology course tended to rate it lower than did students who selected the course" (p. 520).

As previously mentioned, the noninstructional variables of major/minor and required/elective may also be confounded with the variables of class size and course level, because most major or required courses are at higher course levels and tend to be

smaller in class size. Because some noninstructional variables seem to be highly related to one another, the association between noninstructional variables and SRIC should be analyzed with multivariate statistics.

Summary of Noninstructional Variables

As discussed above, tremendous numbers of studies of noninstructional variables and SRIC have been conducted for on-campus courses, and these studies have contributed to SRIC improvement. As a result, some noninstructional variables, such as administration- and instrumentation-related variables are generally well controlled and instructor-related variables were not proven to be highly related with SRIC. However, some noninstructional variables may be substantially associated with SRIC, especially student- and course-related variables. Specifically, these are class size, course level, required/elective, content area, student prior interest, expected grade, student year, and major/minor. Moreover, studies of these noninstructional variables have been reported only for on-campus courses; no report was located of an investigation of the associations of these noninstructional variables with SRIC in distance education courses. In the following section, distance education and the possible associations between noninstructional variables and SRIC in distance education are discussed.

Distance Education in Higher Education

Background

In the 19th century, the growth of the U.S. postal service played an important role in promoting the expansion of distance education in the United States (Institute for

Higher Education Policy [IHEP], 1999). The mailing service system enhanced the opportunities for remote students to correspond with their instructors in writing about assignments, exams, or other aspects of their coursework.

During the 20th century, the further development of distance education continued with the advance of radio, television, and other instructional technologies. More than a decade ago, the Texas Interactive Instructional Network (TI-IN), a pioneer in offering college course credits through interactive distance education technologies, was founded (Barker & Platten, 1988). In their article, Barker and Platten stated the need for research on distance education as follows: "As interest in TI-IN and in other interactive, instrumental satellite systems grows, more in-depth evaluative studies need to be conducted (1) to ascertain instructional effectiveness and (2) to determine how to best use this new approach to delivering instruction" (pp. 49-50). They noted that instructors of satellite courses need to intentionally initiate interaction with their students because they cannot see them.

With the growth of satellite-system utilization in distance learning in higher education, several other electronic technology-based delivery systems, such as two-way interactive microwave and computer-mediated instruction (on-line), had also been developed by the end of the 20th century. As a result, a tremendous amount of research on distance education has been reported. Russell (1999) listed 355 such studies and my ERIC search yielded 4,589 reports of such research (i.e., key words were "distance education" and "higher education"). Two main research foci have been whether teaching effectiveness is the same for on-campus courses and distance education courses, and whether on-campus and distance education students have similar characteristics.

Differences in On-Campus and Distance Instructional Effectiveness

Because SRIC have been used by researchers as a proxy for teaching effectiveness, it is important to know if there are SRIC differences between face-to-face and distance education courses.

Based on his review of research, Russell (1999) concluded that there are no statistically significant differences in teaching effectiveness between traditional on-campus face-to-face and electronic technology-based instruction in distance education. Using statistical si gnificance as his guideline, Russell cited hundreds of reports of no-statistically-significant-difference findings in his book. However, he conducted on statistical analysis of the collected findings, so that he could "leave it to the readers to interpret what those studies mean to them" (p. xiii). Nevertheless, he commented, "The good news is that these no-significant-difference studies provide substantial evidence that technology does not denigrate instruction" (p. xiii). Although Russell obviously stands on the side of "no statistically significant difference" in teaching effectiveness between on-campus and distance education instruction, at this point there is no conclusion on whether there are practical differences in teaching effectiveness, further evidence on whether there are SRIC differences between on-campus and distance education courses is of interest.

Student Characteristics in Distance Education

The characteristics of distance education students are often discussed in the research literature. In an IHEP (1999) report describing the variety of student characteristics, the authors insisted:

> [T]here is wide variance of achievement and attitudes within the groups [of distance learners], which indicate that learners have a variety of different characteristics. The factors influencing these differences could include gender, age, educational experience, motivation, and others. Gathering samples of students and amalgamating them into averages produces an illusory "typical learner," which masks the enormous variability of the student population. Further research needs to focus on how individuals learn, rather than how groups learn. (p. 5)

As concluded in the IHEP report, distance education students' characteristics vary. The best way to discuss teaching effectiveness in distance education may not be to consider all distance-education students as one group, because they have various characteristics. It seems to be important to investigate how individual student characteristics are related to teaching effectiveness without grouping students as "illusory typical learners" in distance education. Correlating SRIC and noninstructional variables for distance education students, using student characteristics variables such as major, student year, expected grade, prior interest, and current GPA, was a part of this study.

Noninstructional Variables in Distance Education Courses

Only a few studies have been conducted to determine whether and to what degree the findings of noninstructional variables-SRIC associations for on-campus courses are applicable to distance education courses. Also, noninstructional variables that occur in distance education, but not in on-campus courses, such as host/remote site, site size, and delivery system, may be associated with SRIC.

Site size is an unique concept for distance education courses, as compared to on-campus courses. Site size is not the same as different sections in an on-campus course. For example, 28 sections were available in the "English 1010" course for spring semester

2000 at USU (see Appendix A), but students in these sections were taught by 28 different instructors, at different times and locations. However, in a distance education course with multiple sites, students take the course at different locations, but at the same time and with the same instructor. Also, students in a distance education course can talk across the sites during their class sessions. These characteristics differentiate sites from course sections.

Host Site Versus Remote Site

An important variable in distance education, as opposed to on-campus traditional education, is whether an instructor is physically present in a student's classroom. There is a variety of host sites and remote sites in satellite- and microwave-delivered courses, which are frequently described as televised courses (Hackman & Walker, 1990).

One of few studies on SRIC for distance education courses was conducted by Spooner et al. (1999). They first compared SRIC between on-campus and distance education courses, and then compared SRIC between host sites and remote sites in distance education. Their participants were graduate students in two special education courses from both on-campus ($n_1 = 4$, $n_2 = 11$) and distance education ($n_1 = 23$, $n_2 = 13$) classes. In addition to a 5-point-scale overall item, 25 specific items were organized into five areas of ratings. The five areas were course (4 items with an overall item), instructor (4 items), organization (4 items), teaching (5 items), and communication (8 items). Even though Spooner et al. did not have random samples, they reported that there were no statistically significant differences in SRIC between on-campus and distance education courses, or between host sites and remote sites in distance education.

However, Spooner and colleagues' (1999) sample sizes were extremely small ($n_{1\ host} = 9$, $n_{1\ remote} = 14$; $n_{2\ host} = 2$, $n_{2\ remote} = 11$), and based on my calculation, there were educationally significant differences between the host and remote sites. The effect sizes (Cohen's *d*) for "host sites" minus "remote sites" for the overall rating were .44 for one course and -.49 for the other course; .20 and -2.31 for course; .73 and -.26 for instructor; 1.40 and -.30 for organization; .29 and -.99 for teaching; and .62 and -1.00 for communication. The magnitude of the effect sizes was not consistent and the direction of the *d* was different between the two courses in every comparison. It is likely that host versus remote sites did not account for the differences. Instructor and course differences are more likely causes of the site differences. This study added little to our knowledge about distance education SRIC.

Also, as a part of study comparing host and remote sites in distance education courses at Utah State University, I investigated (see p. 123 ff) whether there was a difference in mean SRIC. The participants were 318 students from eight distance-education courses.

A 7-point Likert scale was used for 17 instruction/instructor-related items (INST), 7 technology-related items (TECH), and 12 course management-related items (MNGM). These three categories were used as SRIC subcategories and the mean scores between host- and remote-groups were compared.

Mean INST, TECH, MNGM ratings by host-site students were higher; however, only the MNGM difference was educationally significant (see the definition of educational significance on p. 74 ff), with $d = .53$ (see later section).

Site Size in Distance Education

Another important variable in distance education is site size, defined as the number of students in a physical classroom at a host or remote site. Because they are not physically in the same classroom with all their classmates (i.e., the class), students may be less sensitive to their class size as compared to students in on-campus courses. Even though the technology can allow distance education students to do some talking across the sites during their class sessions, the number of fellow students at a site (i.e., site size) may be more related to SRIC than class size in distance education.

The relation of site size to student satisfaction and motivation in distance education courses has been investigated (Biner, Welsh, Barone, Summers, & Dean, 1997; Geen, 1991; Shaver, Furman, & Buhrmester, 1985). However, the research outcomes were varied. Some researchers concluded that students at larger sites have more positive attitudes and motivation, because of more social and emotional support, more sharing of academic information, and more peer-based aid (Shaver et al.). On the other hand, Geen concluded that a smaller site in distance education improved students' motivation and satisfaction, because there is less distraction, social anxiety, and evaluation apprehension. Biner et al. also found that students at smaller sites reported higher satisfaction with their instructor and instruction. The correlation coefficient between site size and satisfaction level with instructor and instruction was -.24, which was educationally significant ($r^2 >$ .05; see the definition of educational significant level on p. 74 ff).

I also investigated (p. 123 ff) whether there was an educationally significant association between SRIC and the number of students at sites, and found an educationally significant association between site size (both host and remote sites) and ratings of

management for the host-site group (r = -.29, r^2 = .08). For the remote-site group, I found educationally significant associations with site size and ratings of instruction and satisfaction (r = -.25, r^2 = .06 for instruction; r = -.30, r^2 = .09 for satisfaction). These results suggested it would be worth investigating the relation of SRIC with other noninstructional variables for distance education courses.

Delivery Systems

Type of delivery system in distance education is a noninstructional variable that may be related to SRIC. For example, at USU, students in off-campus education may take courses through satellite, on-line, microwave-based (EDNET) tele-video, and face-to-face delivery. Off-campus students can select their courses from several delivery systems, depending on availability. Some students mention the variety of delivery systems as an advantage of off-campus education. However, selection of type of delivery is limited to those who reside near relatively large off-campus sites (e.g., major branch sites).

In reviewing the research on electronic instructional technologies as instructional delivery systems, it is important to determine whether each study is a media comparison study or a media study, because media comparison studies do not generally contribute to improving instruction. Ross and Morrison (1996) defined media comparison studies as those in which "different types of media-based instruction [are compared] to one another or to teacher-based instruction to determine which approach was 'best'" (p. 1167). Clark (1982) summarized the results of media comparison studies as follows:

> [We] cannot validly claim any advantage of one medium over another when student achievement is the issue. Media do not contribute to learning any more

> than the vehicles that deliver experts to a problem-solving conference contribute to the experts' understanding of the problem or to the eventual solution of the same. The choice between instructional mediums is based simply and finally on their capacity to carry the intended message and our resources. (p. 60)

Although the purpose of media comparison studies is to compare and investigate which media are better, the purpose of media studies is, according to Ross and Morrison (1996), to reach "further understanding of (a) how media differ in their capabilities for conveying instructional strategies, and (b) how the influences of instructional strategies are maintained or altered via different media presentations" (p. 1169).

In this study, two instructional technologies (satellite, EDNET) were investigated along with face-to-face instruction. The purpose, however, was not to compare the instructional delivery systems to determine which is the best, as in a media comparison study. It was, rather, to find if SRIC were associated with the different electronic technology-based delivery systems.

Current Shortcomings in Distance Education Research

According to the IHEP (1999) report, large amounts of research have been conducted to seek an answer to the question, "What impact is all of this technology having on the educational effectiveness of colleges and universities?" (p. 1). The IHEP report described three broad measures of distance education effectiveness: student outcomes, student attitudes about learning through distance education, and overall student satisfaction (i.e., SRIC).

In the IHEP report, research results were reviewed and summarized, and readers were advised to interpret research in distance education as follows:

> A closer look at the research, however, reveals that it may not be prudent to accept these findings at face value. Several problems with the conclusions reached through this research are apparent. The most significant problem is that the overall quality of the original research is questionable and thereby renders many of the findings inconclusive. (p. 3)

The following four key shortcomings in research on the teaching effectiveness of distance education were noted:

> 1. Much of the research does not control for extraneous variables and, therefore, cannot show cause and effect.
> 2. Most of the studies do not use randomly selected subjects.
> 3. The validity and reliability of the instruments used to measure student outcomes and attitudes are questionable.
> 4. Many studies do not adequately control for the feelings and attitudes of the students and faculty—what the educational research refers to as "reactive effects." (pp. 3-4)

The authors explained the fourth shortcoming as:

> [R]eactive effects are a number of factors associated with the way in which a study is conducted and the feeling and attitudes of the students involved. One reactive effect is known as the *Novelty Effect*, and refers to increased interest, motivation, or participation on the part of students simply because they are doing something different, not better *per se*. Another, called the *John Henry Effect*, refers to control groups or their teachers feeling threatened or challenged by being in competition with a new program or approach and, as a result, outdoing themselves and performing well beyond what would normally be expected. (p. 4)

The IHEP report authors also claimed that distance education research methodologies lack quality and listed seven criticisms:

> 1. The research has tended to emphasize student outcomes for individual courses rather than for a total academic program.
> 2. The research does not take into account differences among [distance education] students.
> 3. The research does not adequately explain why the drop-out rates of distance learners are higher.
> 4. The research does not take into consideration how the different learning styles of students relate to the use of particular technologies.
> 5. The research focuses mostly on the impact of individual technologies rather than on the interaction of multiple technologies.
> 6. The research does not include a theoretical or conceptual framework

7. The research does not adequately address the effectiveness of digital "libraries." (pp. 5–6)

In the section on Procedures and Methods for the study of on- and off- campus SRIC and noninstructional variables, I explain how I accounted for or dealt with the four shortcomings in research on distance education (p. 78 ff) and the seven criticisms of research methodologies (p. 79 ff).

Summary

There has long been a major argument concerning whether teaching effectiveness and student satisfaction in higher education distance education courses are different from those in traditional on-campus courses. With recent technological advances, various instructional delivery systems have been developed and the debate continues.

Enormous amounts of research have been done on SRIC, which is recognized as "the most widely and extensively researched method of assessing teaching effectiveness" (Howard et al., 1985, p. 187). In accord with many other universities, USU uses SRIC as an indicator of student satisfaction and perceived teacher effectiveness. However, no research has been reported on the dimensions of the USU SRIC form; factor analysis would provide valuable information about the form.

Researchers have found various noninstructional variables to be associated with SRIC in on-campus courses. This literature review has demonstrated that class size, course level, required/elective, content area, student prior interest, expected grade, student year, and major/minor are noninstructional variables with potential for association with SRIC.

Only a few reports were located of research on the association of noninstructional variables with SRIC in distance education courses. Site (host/remote), type of electronic technology-based delivery system, and site size are noninstructional variables with potential for research on distance education courses, in addition to the usual on-campus noninstructional variables.

CHAPTER III

STUDY PURPOSE, POPULATION, AND METHODOLOGY

Purpose and Research Questions

The general purposes of the study reported here were to determine if there were differences in SRIC between on-campus and off-campus courses, if selected noninstructional variables had educationally significant associations with USU SRIC, and whether there were differences in the associations for off- and on-campus courses. Because the multidimensionality of the USU SRIC had not been investigated, factor analyses were conducted prior to the other analyses.

The following research questions were examined:

1. Are there educationally significant differences in mean SRIC scores for on-campus and off-campus courses?

2. Are selected noninstructional variables associated with the identified factor(s) of the USU SRIC in on-campus courses?

3. Are selected noninstructional variables associated with the identified factor(s) of the USU SRIC in off-campus face-to-face courses?

4. Are selected noninstructional variables associated with the identified factor(s) of the USU SRIC in distance education courses?

5. Are there differences in the noninstructional variables-SRIC factor associations for on-campus and off-campus courses?

Research Settings

On-Campus Courses at USU

At the time of this study (2000), USU had 45 departments in eight academic colleges, and more than 3,000 on-campus courses were offered at the main campus in Logan, Utah. The eight academic colleges were Agriculture (AGRI), Business (BUS), Education (EDUC), Engineering (EN), Family Life (FL), Humanities, Arts, and Social Science (HASS), Natural Resources (NR), and Science (SCI). The on-campus student enrollment in Fall 1999 was approximately 20,000, including full-time and part-time students.

Off-Campus Courses at USU

In Fall 1999, USU offered off-campus courses at 108 different remote sites, including 23 USU Education Network satellite sites and 85 county extension sites (USU Distance Education, 1999; USU, 2000). The off-campus facilities are located throughout Utah and in Idaho and Wyoming (towns near Utah's borders). The instructional delivery systems are on-line, satellite, EDNET, and off-campus face-to-face instruction (see Figure 1 and Table 3).

On-line courses. On-line courses are based on instruction through the Internet. Some on-line courses are now offered with audio and visual technology supports; however, at this time, these technologies are not fully developed for all on-line courses. In 1999, USU offered several courses on the Internet and the Department of English offered a master's degree with a specialization in technical writing that could be obtained taking only on-line courses.

Table 3

Instructional Delivery System Characteristics in On-Campus and Off-Campus Courses at USU in 2000

				Visual			Audio		
					On screen			Through telephone line	
Population	Systems	Site	Text	In-person	To student	From student	In-person	To student	From student
Off-campus	On-line		Yes	No		No	No	No	No
	Satellite	Remote	Yes	No	Yes	No	No	Yes	Yes
	EDNET	Remote	Yes	No	Yes	Often	No	Yes	Yes
	EDNET	Host	Yes	Minimal[a]	Yes	Often (N/A)	Minimal[a]	Yes	Yes
	Satellite	Host	Yes	Yes	Yes	N/a	Yes	Yes	Yes
	Face-to-face		Yes	Yes	N/a	N/a	Yes	N/a	N/a
On-campus	On-line		Yes	Minimal[a]	No	No	Minimal[a]	No	No
	Face-to-face		Yes	Yes	N/a	N/a	Yes	N/a	N/a

[a]Before or after class or outside of class time, instructor may be available to talk with students.

Satellite courses. The main site at the Logan campus and the 22 other USU Education Network satellite sites have a digital direct broadcast satellite (DBS) system (one-way full motion video to students, two-way audio communication). The DBS system includes an instructor camera, an overhead document camera, a desktop PC, VHS videotape playback, laserdisc player, and an electronic white board (Utah State University Distance Education, 2000a). There is no visual transmission between student sites and the visual transmission is one-way, only from instructor to students.

Most of the satellite courses are sent out from the Logan campus to the remote sites; however, courses can be sent out from other sites and sometimes are. At all the sites, the students are able to interact with the instructor and other students via microphone. Voice transmission is through a dedicated telephone line, so there is no delay.

Site facilitators at each site "distribute and collect class material, proctor exams and quizzes, and report class needs or problems as they occur" (Utah State University Distance Education, 2000b). The satellite broadcasting system at USU is equivalent to those employed at some other universities (Biner et al., 1997).

EDNET courses. EDNET courses are offered through microwave delivery to 23 locations. The same as the satellite system courses, the students are able to interact with the instructor and other students via microphone from all the sites. However, EDNET delivery differs from the satellite system courses in two characteristics. First, in contrast with the satellite system, EDNET courses have two-way visual transmission. Students are frequently shown on a monitor screen, and an instructor may see EDNET students

during instruction. Therefore, more visual communication is involved in EDNET than in satellite courses.

Second, at the EDNET host site, instructors are alone in a studio, while with the satellite system, instructors are in front of host-site students. The host-site EDNET students are in another room watching their instructors on a TV screen, so their situation is similar to that of satellite remote students; however, EDNET host-site students may have a chance to communicate with their instructor in person before or after class (Table 3).

Off-campus face-to-face courses. USU off-campus face-to-face courses are offered without the satellite or EDNET systems; therefore, there are no remote sites (see Table 3). Off-campus face-to-face courses are taught using the same face-to-face delivery system as on-campus traditional courses.

Participants

In this study, the participants were an accessible population and there was no random sampling or assignment. The participants were students who registered in the spring semester 2000 at USU. As explained below, they were in three instructional delivery groups: distance education courses, off-campus face-to-face courses, and on-campus courses.

Distance education courses. USU SRICs were collected from students in 60 satellite courses, 6 EDNET courses, and 4 on-line courses. The following detailed information is listed in Table 4: instructional delivery system (satellite, EDNET, or on-line); course name; college; course level; number of registered students on the 15th day

Table 4

Distance Education Courses (Satellite, EDNET, and On-Line) in Spring 2000

Instructional delivery system[a]	Course	Course number	College	15th day registration	15th day registration		End of sem. registration	Scanned forms[b]	Return rate[c]	On-campus matching
					Host	Remote				
EDNET	INST	6010	EDUC	53	3	50	52	24	46.2	
EDNET	INST	6400	EDUC	59	5	54	59	30	50.8	
EDNET	PSY	6240	EDUC	55	7	48	57	18	31.6	
EDNET	PSY	6260	EDUC	56	8	48	58	15	25.9	
EDNET	SPED	5050	EDUC	37	8	29	35	39	111.4[d]	Yes
EDNET	SPED	5310	EDUC	30	0	30	29	26	89.7	
Satellite	ACCT	2020	BUS	110	8	102	106	73	68.9	Yes
Satellite	ACCT	3120	BUS	56	9	47	56	47	83.9	Yes
Satellite	ACCT	3310	BUS	33	2	31	34	20	58.8	Yes
Satellite	BA	4550	BUS	89	8	81	89	56	62.9	Yes
Satellite	BIS	1410	BUS	54	0	54	51	31	60.8	Yes
Satellite	BIS	2450	BUS	101	4	97	94	40	42.6	Yes
Satellite	BIS	5300	BUS	60	26	34	56	24	42.9	Yes
Satellite	BIS	5450	BUS	33	0	33	32	18	56.3	Yes
Satellite	BIS	6300	BUS	60	8	22	61	43	70.5	Yes
Satellite	BIS	6410	BUS	73	32	41	73	55	75.3	Yes
Satellite	ECON	4010	BUS	83	8	75	79	59	74.7	Yes

(*table continues*)

Instructional delivery system[a]	Course	Course number	College	15th day registration	15th day registration		End of sem. registration	Scanned forms[b]	Return rate[c]	On-campus matching
					Host	Remote				
Satellite	ECON	5680	BUS	28	1	27	31	24	77.4	Yes
Satellite	MHR	6630	BUS	27	1	26	26	24	92.3	Yes
Satellite	EDUC	6080	EDUC	21	6	15	20	19	95.0	
Satellite	EDUC	6550	EDUC	47	1	46	48	46	95.8	
Satellite	EDUC/PSY	6010	EDUC	10	0	10	10	10	100.0	
Satellite	ELED	3100	EDUC	24	9	15	25	21	84.0	Yes
Satellite	ELED/SCED	6100	EDUC	43	2	41	46	47	102.2[d]	
Satellite	ELED/SCED	6320	EDUC	32	0	32	31	26	83.9	
Satellite	HEP	3500	EDUC	12	4	8	13	11	84.6	Yes
Satellite	HEP	5700	EDUC	11	2	9	11	7	63.6	
Satellite	INST	5020	EDUC	32	2	30	32	30	93.8	
Satellite	INST	5030	EDUC	30	6	24	30	10	33.3	
Satellite	PSY	1010	EDUC	82	1	81	72	62	86.1	Yes
Satellite	PSY	1210	EDUC	10	1	9	9	5	55.6	Yes
Satellite	PSY	2800	EDUC	56	8	48	55	38	69.1	Yes
Satellite	PSY	3660	EDUC	52	1	51	52	40	76.9	Yes
Satellite	PSY	4210	EDUC	62	9	53	63	41	65.1	Yes
Satellite	PSY	4230	EDUC	17	1	16	17	14	82.4	
Satellite	SPED	4000	EDUC	27	0	27	27	21	77.8	Yes

(*table continues*)

Instructional delivery system[a]	Course	Course number	College	15th day registration	15th day registration		End of sem. registration	Scanned forms[b]	Return rate[c]	On-campus matching
					Host	Remote				
Satellite	SPED	6060	EDUC	25	2	23	23	19	82.6	
Satellite	SPED	6790	EDUC	29	4	25	28	28	100.0	
Satellite	FHD	3130	FL	27	10	17	28	13	46.4	Yes
Satellite	FHD	3210	FL	46	16	30	47	34	72.3	Yes
Satellite	FHD	3510	FL	44	13	31	46	17	37.0	
Satellite	FHD/PSY	3120	FL	65	22	43	65	64	98.5	Yes
Satellite	HENV	6550	FL	20	9	11	20	20	100.0	
Satellite	HENV	6570	FL	11	3	8	11	8	72.7	
Satellite	ANTH	1030	HASS	39	7	32	35	30	85.7	Yes
Satellite	ANTH	3110	HASS	14	1	13	12	10	83.3	
Satellite	ENGL	2010	HASS	72	4	68	69	36	52.2	Yes
Satellite	ENGL	3530	HASS	29	4	25	27	21	77.8	
Satellite	HIST	1050	HASS	22	2	20	15	12	80.0	
Satellite	HIST	3230	HASS	13	5	8	13	10	76.9	
Satellite	PHIL	2400	HASS	35	1	34	31	19	61.3	Yes
Satellite	SOC	1020	HASS	43	2	41	41	34	82.9	Yes
Satellite	SOC	3120	HASS	13	4	9	13	11	84.6	Yes
Satellite	SW	2500	HASS	9	1	8	10	7	70.0	Yes
Satellite	SW	3350	HASS	8	0	8	7	7	100.0	

(*table continues*)

Instructional delivery system[a]	Course	Course number	College	15th day registration	15th day registration		End of sem. registration	Scanned forms[b]	Return rate[c]	On-campus matching
					Host	Remote				
Satellite	USU	1340	HASS	46	20	26	41	10	24.4	Yes
Satellite	GEOG	1130	NR	39	0	39	34	26	76.5	Yes
Satellite	USU	1310	NR	101	25	76	95	62	65.3	
Satellite	CS	1700	SCI	71	12	59	67	42	62.7	Yes
Satellite	CS	3100	SCI	13	4	9	12	10	83.3	Yes
Satellite	CS	5700	SCI	32	13	19	32	19	59.4	
Satellite	CS	6650	SCI	28	22	6	27	27	100.0	
Satellite	MATH	1010	SCI	95	42	53	92	56	60.9	Yes
Satellite	MATH	1060	SCI	12	3	9	11	8	72.7	Yes
Satellite	MATH	1100	SCI	50	21	29	46	32	69.6	Yes
Satellite	STAT	1040	SCI	47	7	40	45	35	77.8	Yes
TOTAL				2,775	470	2,293	2,694	1,852	68.7	

[a]Included are 6 EDNET, 4 on-line, and 60 satellite courses. [b]Numbers of SRIC forms that were returned and processed. [c]Return rate = (Scanned forms) / (End of semester registration). [d]Total more than 100% could be due to a number of factors: miss-scanning; forms from audit students; students registered for an on-campus course but attending a distance education course.

of the semester, with host or remote setting; number of registered students at the end of the spring semester; number of scanned forms; return rate; and on-campus matching (see the following On-campus Courses section). The return rate was calculated for each course based on the total number of scanned forms for the course divided by the number of registered students at the end of the spring semester.

Out of the available data, two satellite and two EDNET courses (total of 18 students in the four courses) were excluded because they were not lecture courses (e.g., workshops) and were taught by multiple instructors. For the multiple-instructor courses, some students used separate course evaluation sheets and others evaluated multiple instructors together on a single form.

Data analysis was conducted on 1,852 usable forms from distance education courses. Because the SRIC were administered anonymously, there was no information available for how many forms were filled out by the same participants enrolled in more than one course. Even though students in all satellite and EDNET courses received the SRIC form, the form was not administered in all on-line courses. The SRIC return rate for all distance education courses was 68.7%, based on the courses for which one or more completed USU SRIC forms were returned.

No on-line courses are listed in Table 4, because the USU SRIC forms were available from only 4 out of 79 courses. The USU SRIC form was sent to each on-line student in the mail and used by the Office of Planning and Analysis only if received by its deadline. Because the courses were taught on-line, sending out the USU SRIC forms may not have been an efficient way to obtain students' responses. In fact, many course instructors set up their own course evaluation forms and sent them to their students on-

line. Even though some on-line classes were listed as "on-campus," the students were usually away. They could even be abroad. USU has no plans at this time to have on-line course students submit their evaluations electronically to the Office of Planning and Analysis.

Off-campus face-to-face courses. USU SRIC forms were collected from the students in166 off-campus face-to-face courses, a total of 1,737 forms. The rating forms were not administered in some off-campus face-to-face courses. The return rate was 71.2%, calculated based on the number of registered students at the end of the spring semester for courses for which one or more USU SRIC forms were returned (see Table 5). Off-campus face-to-face courses were offered in so many locations that administration of the USU SRIC form could not be arranged in all, sometimes due to lack of administrative assistants at the locations. The off-campus face-to-face education courses were also sometimes not taught on the same term schedule as on-campus courses, so the USU SRIC forms were administered later than usual, sometimes too late to use.

On-campus courses. Because there were many more courses offered for on-campus students than for off-campus students, on-campus courses were selected that matched courses offered off-campus. As a result, there were 315 matching on-campus courses with 11,114 forms, and the return rate was 67.6%. The course names and the number of students are listed in Appendix A.

Table 4 also contains a column labeled "On-campus Matching," which shows whether there was a matching on-campus course for each distance education

Table 5

Off-Campus Face-to-Face Courses in Spring 2000

Course	Course number	College	# of sections	15th day registration	End of sem. registration	Scanned forms	Return rate	On-campus matching
PLSC	2200	AGR	1	20	20	15	75.0	Yes
PLSC	3050	AGR	1	11	10	7	70.0	Yes
PLSC	3200	AGR	1	16	13	12	92.3	
PLSC	3300	AGR	1	14	14	11	78.6	Yes
PLSC	4500	AGR	2	25	24	19	79.2	Yes
PSB	4890	AGR	1	12	11	10	90.9	Yes
ACCT	2010	BUS	1	15	13	13	100.0	Yes
ACCT	6350	BUS	2	33	56	48	85.7	Yes
BIS	1400	BUS	5	118	112	82	73.2	Yes
BIS	1410	BUS	3	43	40	23	57.5	Yes
BIS	1420	BUS	1	9	7	5	71.4	Yes
BIS	1550	BUS	1	10	10	7	70.0	Yes
BIS	2300	BUS	1	13	13	11	84.6	Yes
BIS	2400	BUS	1	8	8	7	87.5	Yes
BIS	2450	BUS	2	42	41	32	78.0	Yes
BIS	2550	BUS	1	23	23	21	91.3	Yes
BIS	2600	BUS	2	14	14	9	64.3	Yes
BIS	3100	BUS	1	30	30	14	46.7	Yes
BIS	3330	BUS	1	4	4	4	100.0	Yes
BIS	5300	BUS	1	16	16	12	75.0	Yes
BIS	5700	BUS	1	16	16	13	81.3	Yes
BIS	5450/ 6450	BUS	1	4	4	4	100.0	Yes
ECON	1500	BUS	1	23	22	11	50.0	Yes
ECON	2010	BUS	1	12	12	10	83.3	Yes
ECON	3400	BUS	2	34	34	27	79.4	Yes
MHR	2990	BUS	1	13	12	10	83.3	Yes
MHR	4890	BUS	1	5	4	4	100.0	Yes

(*table continues*)

Course	Course number	College	# of sections	15th day registration	End of sem. registration	Scanned forms	Return rate	On-campus matching
MHR	6670	BUS	1	21	25	24	96.0	
MHR	6890	BUS	1	25	27	23	85.2	Yes
EDUC	6100	ED	1	10	10	10	100.0	
ELED	4000	ED	2	26	26	12	46.2	Yes
ELED	4030	ED	2	28	28	14	50.0	Yes
ELED	4040	ED	2	28	28	26	92.9	Yes
ELED	4050	ED	2	28	28	14	50.0	Yes
ELED	4060	ED	2	28	28	13	46.4	Yes
ELED	5000	ED	1	6	6	4	66.7	
ELED	6440	ED	1	6	6	6	100.0	
ELED	6420/ 6430	ED	1	28	28	15	53.6	
HEP	2300	ED	1	5	4	2	50.0	
HEP	5700	ED	1	27	23	17	73.9	Yes
PE	1230	ED	2	36	39	23	59.0	Yes
PE	1300	ED	1	7	11	12	109.1	Yes
PE	1330	ED	1	5	4	4	100.0	Yes
PEP	3050	ED	2	44	41	38	92.7	Yes
PEP	6400	ED	1	16	16	13	81.3	
PSY	1010	ED	2	79	74	49	66.2	Yes
PSY	1220	ED	2	33	33	19	57.6	Yes
PSY	1730	ED	1	11	11	6	54.5	Yes
REH	6120	ED	2	55	47	19	40.4	Yes
REH	6160	ED	2	49	48	14	29.2	
SPED	5070	ED	2	22	21	23	109.5	
FHD	1500	FL	2	37	37	24	64.9	Yes
FHD	2610	FL	1	16	16	15	93.8	
FHD	3520	FL	1	7	7	7	100.0	
FHD	3530	FL	1	3	3	3	100.0	Yes
FHD	4240	FL	1	5	5	4	80.0	Yes

(*table continues*)

Course	Course Number	College	# of Sections	15th day Registration	End of Sem. Registration	Scanned Forms	Return Rate	On-Campus Matching
ART	2720	HAS	1	15	13	11	84.6	Yes
ART	2800	HAS	1	14	14	10	71.4	
ART	2810	HAS	2	20	20	14	70.0	Yes
ART	3810	HAS	1	3	3	2	66.7	Yes
ART	3830	HAS	1	3	3	3	100.0	Yes
ART	4830	HAS	1	5	6	2	33.3	
ENGL	1010	HAS	6	110	106	76	71.7	Yes
ENGL	2010	HAS	4	72	71	57	80.3	Yes
ENGL	3420	HAS	1	8	8	7	87.5	
ENGL	4220	HAS	1	6	6	5	83.3	Yes
ENGL	4300	HAS	1	2	2	2	100.0	Yes
ENGL	4510	HAS	1	3	3	2	66.7	Yes
ENGL/ HIST	1710	HAS	1	10	10	5	50.0	
HIST	1040	HAS	1	20	20	16	80.0	Yes
HIST	1700	HAS	2	45	45	12	26.7	Yes
HIST	2710	HAS	1	10	9	6	66.7	Yes
HIST	4290	HAS	1	6	6	6	100.0	Yes
HIST	4710	HAS	1	14	14	8	57.1	
HIST/ ANTH/ ENG	1710	HAS	1	16	14	9	64.3	
LAEP	1030	HAS	1	8	8	7	87.5	Yes
MUSC	1550	HAS	1	8	7	4	57.1	Yes
MUSC	3260	HAS	1	24	24	20	83.3	Yes
POLS	1100	HAS	1	9	9	8	88.9	Yes
SPAN	1020	HAS	2	16	16	11	68.8	Yes
SPAN	3550	HAS	1	9	8	6	75.0	
SPCH	1050	HAS	2	46	47	32	68.1	Yes
SPCH	2600	HAS	1	15	15	9	60.0	
THEA	1020	HAS	1	7	8	7	87.5	
THEA	1030	HAS	2	32	32	27	84.4	

(*table continues*)

Course	Course Number	College	# of Sections	15th day Registration	End of Sem. Registration	Scanned Forms	Return Rate	On-Campus Matching
USU6	1300	HAS	1	13	12	6	50.0	
USU6	1320	HAS	1	25	25	19	76.0	
USU6	1330	HAS	1	29	29	22	75.9	
FW	1200	NR	1	17	16	12	75.0	Yes
FW	2200	NR	1	7	6	4	66.7	Yes
NR	1010	NR	1	9	9	7	77.8	Yes
BIOL	1010	SCI	2	20	18	16	88.9	Yes
BIOL	1110	SCI	2	74	73	55	75.3	
BIOL	1220	SCI	1	8	8	6	75.0	Yes
BIOL	1240	SCI	1	8	8	6	75.0	Yes
BIOL	2010	SCI	1	19	17	13	76.5	Yes
CHEM	1010	SCI	2	25	22	18	81.8	Yes
CHEM	1120	SCI	1	4	4	4	100.0	Yes
CHEM	1130	SCI	1	4	4	4	100.0	
CHEM	1220	SCI	1	9	9	4	44.4	Yes
CHEM	1240	SCI	1	7	7	4	57.1	Yes
MATH	0900	SCI	2	40	40	27	67.5	Yes
MATH	1010	SCI	4	73	71	49	69.0	Yes
MATH	1050	SCI	5	94	89	72	80.9	Yes
MATH	1100	SCI	1	16	16	12	75.0	Yes
MATH	1210	SCI	1	8	8	5	62.5	Yes
MATH	2020	SCI	1	7	7	6	85.7	Yes
PHYX	1000	SCI	1	11	10	6	60.0	
PHYX	1100	SCI	1	15	15	11	73.3	
PHYX	2210	SCI	1	10	10	5	50.0	Yes
STAT	1040	SCI	1	18	17	15	88.2	Yes
STAT	2300	SCI	1	24	24	19	79.2	Yes
USU8	1310	SCI	1	23	21	8	38.1	
USU8	1310	SCI	1	38	36	24	66.7	
TOTAL				2,485	2,441	1,737	71.2	

course.[1] There were few off-campus face-to-face courses from the Colleges of Agriculture and Natural Resources. These courses were excluded from the regression analyses, because there were too few to use within the noninstructional variable, college.

Procedures and Methods

Instrumentation—USU SRIC Form

The "Teacher/Course Evaluation" form at USU is hereinafter referred to as the USU SRIC form.

Format. The USU SRIC form consists of five sections: four sections of closed-end questions with scannable answer sheet, and one section of open-ended questions. On the front page, students fill in the name of their instructor, the course number, and the section. These instructions follow:

> Student evaluations are [an] important part of the assessment of teaching effectiveness. Please respond as honestly and candidly as possible. Disregard questions which do not seem to be applicable. The completed forms and the computer data will not be available to the instructor until after class grades are awarded.

As shown in Table 6, the four close-ended question sections are general evaluation (2 items), information about the course (8 items), information about instruction (10 items), and information about students (5 items). Items of general

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[1] The USU SRIC forms were not administered in several on-campus courses. Those courses were excluded from being used as matching courses.

evaluation are rated on a 6-point Likert scale (excellent, very good, good, fair, poor, and very poor); the items in the sections for information about the course and information about instruction have a choice of "not applicable," in addition to the 6-point Likert scale. Table 6 also lists item names assigned for this study.

On the back of the SRIC form, there are two open-ended questions: "What aspects of the teaching or content of this course do you feel were especially good?" and "What changes could be made to improve the teaching or the content of this course?" This form seems to be a typical SRIC format, based on the information from Braskamp and Ory (1994).

History. Chamberlain (1999) described the history of the USU SRIC form in her master's thesis. In May 1989 at USU, a Faculty Evaluation Committee was formed to "establish a more complete evaluation system" ("Faculty Senate Memorandum" on May 15, 1989, cited in Chamberlain, 1999, p. 16). The need to improve the previous course evaluation form was based on survey results from 285 faculty members. The faculty members who responded were not satisfied with the course evaluation form, because the information was not helpful for improving their teaching.

The Faculty Evaluation Committee examined several processes for obtaining student ratings, including that of the University of Southern California. In March 1993, Larry A. Blaskamp from the University of Illinois came to USU to consult on the development of an SRIC form. At that time, the discussion was focused on "the possibility of one form serving the needs of three diverse groups (administration, faculty, and students) and the question of whether the same form could serve both as an

Table 6

Closed-Ended Questions on USU SRIC Form

Sections	Questions	Item names	Ratings
General evaluation	1. The overall quality of this course was:	TOTAL 1	(E, VG, G, F, P, VP)[a]
	2. The instructor's effectiveness in teaching the subject matter was:	TOTAL 2	(E, VG, G, F, P, VP)
Information about	1. The extent to which course objectives were clear was:	COURSE 1	(E, VG, G, F, P, VP, NA)[b]
the course	2. Relevance of assignments to course content was:	COURSE 2	(E, VG, G, F, P, VP, NA)
	3. Relevance of material presented in class to course goal(s) was:	COURSE 3	(E, VG, G, F, P, VP, NA)
	4. Appropriateness of workload to course goal(s) was:	COURSE 4	(E, VG, G, F, P, VP, NA)
	5. Relevance of exams to course goal(s) was:	COURSE 5	(E, VG, G, F, P, VP, NA)
	6. Fairness of course grading procedures was:	COURSE 6	(E, VG, G, F, P, VP, NA)
	7. The extent to which course responsibilities of students were clarified was:	COURSE 7	(E, VG, G, F, P, VP, NA)
	8. Helpfulness of assigned texts/readings to achieving course goal(s) was:	COURSE 8	(E, VG, G, F, P, VP, NA)
Information about	1. The extent which course organization helped learning was:	INST 1	(E, VG, G, F, P, VP, NA)
instruction	2. The helpfulness of explanations by the instructor, if/when needed was:	INST 2	(E, VG, G, F, P, VP, NA)
	3. Instructor's use of examples, if/when appropriate, was:	INST 3	(E, VG, G, F, P, VP, NA)

(*table continues*)

Sections	Questions	Item names	Ratings
	4. Instructor's use of class time to help students learn the subject matter was:	INST 4	(E, VG, G, F, P, VP, NA)
	5. Instructor's enthusiasm for subject of course was:	INST 5	(E, VG, G, F, P, VP, NA)
	6. Instructor's helpfulness in resolving student's questions was:	INST 6	(E, VG, G, F, P, VP, NA)
	7. The extent to which the instructor was prepared for class was:	INST 7	(E, VG, G, F, P, VP, NA)
	8. Opportunity to ask questions was:	INST 8	(E, VG, G, F, P, VP, NA)
	9. Opportunity for students to make comments and express opinions was:	INST 9	(E, VG, G, F, P, VP, NA)
	10. Availability of extra help, if/when needed, was:	INST 10	(E, VG, G, F, P, VP, NA)
Information about students	1. At the beginning of the quarter, my interest in the subject matter of the course was:		(High, Medium, Low)
	2. My current GPA at USU is in the range of:		(4.0 – 3.5; 3.4 – 3.0; 2.9 – 2.5; 2.4 – 2.0; 1.9 – 1.0)
	3. This course is being used for:		(my major; my minor; a liberal Arts & Sciences major, minor or certificate; general education; an elective; other)
	4. I am a:		(freshman, sophomore, junior, senior, graduate, other)
	5. Grade I expect to receive is:		(A, B, C, D, F, Pass)

[a]E = Excellent, VG = Very Good, G = Good, F = Fair, P = Poor, VP = Very Poor. [b]NA = Not Applicable.

evaluation tool and as a vehicle for improvement" ("Faculty Student Evaluation," cited in Chamberlain, 1999, p. 19). Based on Blaskamp's consultation advice, committee work, and student/faculty input, the committee proposed the adoption of a modified University of Washington Instructional Assessment System (IAS).

A modified IAS form was proposed to the Faculty Senate in May 1994 (Chamberlain, 1999). In Fall Quarter, 1994, the USU SRIC form was tested, and the form was implemented in Spring Quarter, 1995. Since then, the USU SRIC form has been generally administered in all courses, and the results of the closed-ended items reported to each college, department, and instructor. The summarized reports are also placed in the library and the student center to be available to all students.

The important difference between the USU SRIC instrument and the University of Washington IAS is the number of different forms. When USU adopted the system, the IAS had eight forms, which were based on course style (see p. 13). Most of the USU SRIC item wordings came from the IAS forms; however, the USU SRIC form is not exactly the same as any of the IAS forms.

Previous study of USU SRIC. Since the USU SRIC form has been utilized, no study has been conducted to identify its dimensionality, or factors.[2] In 1999, Petersen (see Appendix B) reported multiple regression analyses of noninstructional variables and

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[2] I contacted Blythe Ashstrom, USU assistant provost; Dr. Craig Petersen, USU vice provost; and Dr. Jeane Vinsonhaler, director, USU Office of Planning and Analysis. They knew of no report of a factor analysis or any other study on the USU SRIC form except Petersen's study.

USU SRIC. He found that 15% of the total variance in USU SRIC scores was explained by the variables of college, course size, course GPA, and course level (graduate and upper/lower division). He concluded, "these [findings] suggest that course evaluations increase with GPA and decrease with course [class] size and if the class is taught in HASS [College of Humanities, Art, and Social Science] compared to Science [College of Science]" (see Appendix B).

Chamberlain (1999) compared USU SRIC for on-campus and on-line introductory English courses (English 1010). Chamberlain did not randomly sample or assign her subjects; however, she conducted *t* tests for 12 English 1010 instructors in the two different teaching environments, traditional classrooms and on-line instruction. She used class rather than student as the unit of analysis, and concluded that the 423 on-line students in 12 classes tended to score their instructors lower than did 462 students in 12 traditional classrooms.

The first overall item, "The overall quality of this course," had a mean of 5.0 on the 6-point SRIC scale for 36 on-campus courses, and 4.8 for 24 on-line courses. No effect sizes or *SD*s were reported; however, an educationally significant ($d \geq .46$, see p. 74) effect size, $d = .59$, was obtained for the first overall item by using the following formula;

$$d = t\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$ (Glass, McGaw, & Smith, 1981, p. 126)

For the second overall item, "The instructor's effectiveness in teaching the subject matter," the mean was 5.2 for on-campus courses, 4.9 for on-line courses, and $d = 1.24$, which is also educationally significant.

For other items, there were two important findings in Chamberlain's study. As previously mentioned, there are 8 items in the section of information about the course (COURSE 1 – 8), 10 items in the section of information about instruction (INST 1 – 10, see p. 55). COURSE 8 was scored higher by on-line course students, but not at an educationally significant level (d = .08); however, the other seven course-related items were scored higher by traditional-classroom students than by on-line students. And the differences were educationally significant ($d_{COURSE1}$ = .69, $d_{COURSE2}$ = .51, $d_{COURSE3}$ = .51, $d_{COURSE4}$ = .78, $d_{COURSE5}$ = .53, $d_{COURSE6}$ = .82, $d_{COURSE7}$ = .1.04). Second, all of the 10 instruction-related item ratings were lower for on-line instructors and the differences were educationally significant, except for INST 4 (d_{INST1} = .49, d_{INST2} = 1.50, d_{INST3} = .66, d_{INST4} = .39, d_{INST5} = 1.06, d_{INST6} = .91, d_{INST7} = .54, d_{INST8} = 1.24, d_{INST9} = 1.59, d_{INST10} = 1.41).

Chamberlain (1999) concluded that although the USU SRIC form was designed for on-campus courses, the course-related items seemed to be appropriate for on-line courses. However, she concluded that the appropriateness of the instruction-related items for on-line courses needed to be investigated further. The USU SRIC results may reflect inherent, but possibly solvable, problems with ratings of on-line instruction.

The educationally significant differences on the nine instruction-related items in Chamberlain's study are of interest, especially the five items that had d >1.00. They were "The helpfulness of explanations by the instructor, if/when needed was (INST 2)," "Instructor's enthusiasm for subject of course was (INST 5)," "Opportunity to ask questions was (INST 8)," "Opportunity for students to make comments and express opinions was (INST 9)," "Availability of extra help, if/when needed, was (INST 10)."

These items were all related to student satisfaction with their interactions or interpersonal relationship with their instructors, and whether students had opportunities to interact with their instructors.

Procedures

Within the last 4 weeks of Spring Semester, 2000, the USU SRIC form (Table 6, p. 57) was administered as a normal university procedure. After forms were received from each remote site, a code to identify the site as a satellite or EDNET course was added by the USU Distance Education Office for use for the study.

By the last day of classes, the university-wide procedures had been completed and all forms were sent to the Office of Planning and Analysis. During the following 4 weeks, the forms were scanned and data entered in a computer database. The site codes for satellite and EDNET courses were included in the data.

Factor Analyses

Even though the 20 items on the USU SRIC form were clustered in three subcategories, "general evaluation," "information about the course," and "information about the instruction" (see Table 6, p. 57), no empirical study had been done to support the multidimensionality of responses to the form. The analyses of this study were conducted in the order of the research questions. To investigate the factorial structure of the USU SRIC, exploratory factor analyses were conducted (Crowley & Fan, 1997). The responses were numerically coded as excellent (= 6) through very poor (= 1), with response "N/A" coded as missing data. The analyses were conducted separately for on-campus, off-campus face-to-face, and distance education courses.

Factor analysis versus principal component analysis. For this main study, a factor analysis (FA) method (i.e., maximum likelihood method) was used on SPSS 11.0 software, rather than the SPSS default of principal components analysis (PCA). Because misunderstanding of PCA and FA is common (Hatcher & Stepanski, 1994; Pedhazur & Schmelkin, 1991), the difference between these methods needs to be discussed.

PCA is used "to arrive at a relatively small number of components that will extract most of the variance of a relatively large set of indicators (variables, items)" (Pedhazur & Schmelkin, 1991, p. 598). Therefore, PCA can be valuable to reduce a number of variables to a smaller number of components. However, in FA methods, such as the maximum likelihood method, "the indicators are viewed as reflective of unobserved variables (i.e., the factors). In other words, the indicators are treated as dependent variables and the factors as the independent variable" (Pedhazur & Schmelkin, p. 598).

The factor analysis in this study was "aimed at explaining *common variance* (i.e., variance shared by the indicators, items, variables…), whereas PCA is designed to extract *total variance*" (Pedhazur & Schmelkin, 1991, p. 598, italics in the original).

It is important to note that with FA methods, initial communalities are estimated using the squared multiple correlations of each variable with the remaining variables, whereas with PCA, 1.0 (the variance of a standardized variable) is used as the initial communalities (Gorsuch, 1983).

Factor analysis method. Various exploratory factor analysis methods, developed by several researchers, are available on statistical software. For example, seven methods are available on SPSS 11.0, principal components, unweighted least squares, generalized

least squares, maximum likelihood, principal axis factoring, alpha factoring, and image factoring. Among these methods, maximum likelihood method (MLM) was selected due to the following two reasons.

First, Gorsuch (1983) included MLM as one of six exploratory factor analysis methods, including the principal components method. He reported that MLM is as accurate as other methods and it could possibly be better than the others at estimating population factor loadings. Gorsuch explained as follows:

> Only in the case of large sample sizes (n = 1500) did the maximum likelihood procedure give distinctively more accurate estimates of the factor loadings than the other procedures. (p. 123)

Because the participants in this study were an accessible population, rather than a random sample, and the accessible population subgroups were all larger than 1,500, the MLM was an appropriate analysis.

Also, Stevens (1996, pp. 387-388) made the point that the choice of factor analytic method makes little difference to the results, especially when there are more than 20 variables and communalities that are .7 and above. Because there were 20 USU SRIC items in the factor analyses, and most of the communalities were found to be .7 and above (see Tables 18 and 20, p. 98 and p. 103), use of the MLM was plausible for this study.

Factor extraction. Factor analysis has two steps: factor extraction and factor rotation. The purpose of factor extraction is to "make an initial decision about the number of factors underlying a set of measured variables" (Green, Salkind, & Akey, 1997, p. 346). The variance in the scores explained by a factor (eigenvalue) and a graph

of eigenvalues (scree plot) are commonly used to identify the number of factors to be extracted.

The magnitude of eigenvalues is one commonly used criterion in deciding how many factors to retain. Those factors with eigenvalues greater than 1 (i.e., the Kaiser criterion) are retained (Hatcher & Stepanski, 1994; Stevens, 1996, p. 366). Hatcher and Stepanski explained the rationale for the criterion as follows;

> The rationale for this criterion is straightforward. Each observed variable contributes one unit of variance to the total variance in the data set. Any component that displays an eigenvalue greater than 1.00 is accounting for a greater amount of variance than had been contributed by one variable. Such a component is therefore accounting for a meaningful amount of variance, and is worthy of being retained. (p. 470)

Scree plots were also considered for use in deciding the number of factors to extract. A scree plot can be created based on the initially estimated eigenvalues. As the term "scree" denotes (i.e., the rubble at the bottom of a cliff), a scree plot analysis is used to locate a point (break point) that is between the "cliff" of the first few factors and the "rubble" of the remaining factors. The usual recommendation is "to retain all eigenvalues (and hence components [factors]) in the sharp descent before the first one on the line where they start to level off" (Stevens, 1996, p. 366).

Based on the consideration above, the Kaiser criterion (i.e., eigenvalue greater than 1.00) and scree plot were used to determine the number of factors to retain. After deciding on the number of factors to retain, the factors were rotated to obtain more interpretable factors.

Factor rotation. The purposes of factor rotation are "to statistically manipulate (i.e., to rotate factors [axes]) the results to make the factors more interpretable and to

make final decisions about the number of underlying factors" (Green et al., 1997, p. 346). There are two types of factor rotation: orthogonal rotation, which yields uncorrelated factors, and oblique rotation, which yields factors that are correlated. Orthogonal rotation yields results are generally more easily interpretable than those from an oblique method. The most widely used and recommended orthogonal rotation method is Varimax (Pedhazur & Schmelkin, 1991, pp. 612-613).

However, if it is expected that the obtained factors will be highly correlated, use of an oblique rotation method is recommended. Pedhazur and Schmelkin (1991) provided guidance for the use of oblique factor rotation, as follows:

> From the perspective of construct validation, the decision whether to rotate factors orthogonally or obliquely reflects one's conception regarding the structure of the construct under consideration. It boils down to the question: Are aspects of a postulated multidimensional construct intercorrelated? The answer to this question is relegated to the status of an assumption when an orthogonal rotation is employed. This is ground enough to question the wisdom of limiting oneself to orthogonal rotations, even when theoretical formulations lead one to expect factors to be not correlated. The preferred course of action is, in our opinion, to rotate both orthogonally and obliquely. When on the basis of the latter, it is concluded that the correlations among the factors are negligible, the interpretation of the simpler orthogonal solution becomes tenable. (p. 615)

Gorsuch (1983, p. 205) suggested rotating obliquely first if there is no evidence to warrant the assumption of orthogonal factors. Then, orthogonal rotation would be conducted if the correlations among factors appear to be "nonsignificant" or "trivial."

Neither Gorsuch (1983) nor Pedhazur and Schmelkin (1991) stated any criteria for deciding on a rotational method. Gorsuch stated:

> [T]hroughout the literature on oblique solutions, comments are made that 'the intercorrelations seem 'too high' or 'too low.' Evaluations of the proper level of correlations among factors are seldom supported by reference to data. The present position is that factors should correlate as highly as one would expect representative measures of the factors to correlate in future research. (p. 189)

However, he also stated that "no one allows the factors to become highly correlated; if two factors ever did become highly correlated, most investigators would redo the analysis with one less factor" (p. 188).

In order to determine whether the intercorrelation of factors was "too high" in this study, an oblique rotation method was conducted first followed by orthogonal rotation methods. There are various oblique rotation methods, such as oblimax, quartimin, maxplane, orthoblique, promax, and oblimin (Stevens, 1996). Promax rotation, which is the most commonly used and recommended oblique analysis (Gorsuch, 1983, p. 374) was used in this study.

Oblique rotation. In oblique factor rotation, the factor structure elements matrix and the factor pattern elements matrix are used to interpret the results.

A factor pattern matrix consists of "elements [that] are analogous to standardized regression coefficients from a multiple regression analysis. That is, a given element indicates the importance of that variable to the factor with the influence of the other variables partialled out" (Stevens, 1996, p. 370).

A factor structure matrix is "equal to the pattern matrix postmultiplied by the matrix of correlations among the factors" (Harman, 1976, p. 31). Alternatively, it consists of "elements [that] are the simple correlations of the variables with the factors, that is, they are the factor loadings" (Stevens, 1996, p. 370). Even though Stevens called the factor structure elements "factor loadings," other authors (e.g., Pedhazur and Schmelkin, 1991, p. 602) prefer to label the factor pattern elements as "factor loadings" and the factor structure elements as "correlation coefficients."

In sum, there is no consensus on which matrix (structure matrix and pattern matrix) should be used as factor loadings. The structure matrix elements provide each item's relationship to the factors, while the pattern matrix elements simplify the structure. Also, the pattern matrix elements do not contain as much item-factor loading information because so many of the elements are small due to the large interitem relationships. Therefore, in this oblique factor rotation analysis, the structure matrix was used as the factor loadings and the pattern matrix was used to provide supportive interpretation.

Orthogonal rotation. Orthogonal factor rotation yields only a factor-loading matrix, because the factors are uncorrelated. In other words, the factor pattern and factor structure matrices are identical in this analysis (e.g., Pedhazur & Schmelkin, 1991, p. 602)

Factor-based scores. It was anticipated that after the factor analyses were computed, the USU SRIC item scores would be converted to factor-based scores (Pedhazur & Schmelkin, 1991, pp. 675-676). Items loaded on each factor were to be summed to obtain scores, called factor-based scores, to be used to investigate research questions 2, 3, and 4. However, I rejected the validity of such use based on the results of the factor analyses (see p. 113).

Analyses for Research Questions 1, 2, 3, and 4

Research question 1 was, "Are there educationally significant differences in mean SRIC scores for on-campus and off-campus courses?" To answer that question, *d*s were computed for pairs of means (see further discussions on p. 74 ff.). Research questions 2, 3, and 4 were, "Are selected noninstructional variables associated with the identified

factor(s) of the USU SRIC in on-campus courses?" "Are selected noninstructional variables associated with the identified factor(s) of the USU SRIC in off-campus face-to-face courses?" and "Are selected noninstructional variables associated with the identified factor(s) of the USU SRIC in distance education courses?" In order to determine the relationships between noninstructional variables and the USU SRIC, several analyses were conducted for on-campus, off-campus face-to-face, and distance education courses.

Zero-order correlation analyses. First, zero-order correlation coefficients were computed among the noninstructional variables and USU SRIC. The noninstructional variables for on-campus and off-campus face-to-face courses analyses were colleges (COL) as content area; course level (LEVEL); class size (SIZE); prior interest (PRIOR); current (cumulative) GPA (GPA); whether the course is in the major (MAJOR), general education (GENERAL), or an elective (ELECTIVE); student year (YEAR); and expected grade (GRADE). In addition to these 10 noninstructional variables, there were three distance education-specific noninstructional variables: whether a student was at host- or remote-site (HOST), whether a course was on EDNET or satellite (SAT), and numbers of students at a site (site-size, SITE; see Table 7 and Figure 2).

Noninstructional variables, such as COL, MAJOR, GENERAL, and ELECTIVE, HOST, and SAT that were categorical were prepared for analysis using dummy coding (Cohen & Cohen, 1983, pp. 183-198; Pedhazur, 1982, pp. 274-279; Pedhazur & Schmelkin, 1991, pp. 465-473). According to Pedhazur (1982), dummy coding is the simplest method to code categorical variables for correlation analysis. In this method, "one generates a number of vectors such that, in any given vector, membership in a given group or category is assigned 1, while nonmembership in the category is assigned 0"

Table 7

List of Noninstructional Variables for On-Campus and Off-Campus Courses

Code	On-campus	Off-campus F2F	Distance	Variable	Description
COL	Yes	Yes	Yes	College	Five colleges, BUS, EDUC, FL, HASS, SCI, coded as dummy vectors
LEVEL	Yes	Yes	Yes	Course Level	The 1st digit of course number (Range = 1 to 7; e.g., when course number is "1010," the course level is "1." When course number is "4010," the course level is "4.")
SIZE	Yes	Yes	Yes	Class Size	Numbers of registered student
PRIOR	Yes	Yes	Yes	Prior Interest	From SRIC, High = 3, Medium = 2, and Low = 1
GPA	Yes	Yes	Yes	Student Reported Current GPA	From SRIC, above 3.5 = 5; 3.4-3.0 = 4; 2.9-2.5 = 3; 2.4-2.0 = 2; and below1.9 = 1
MAJOR	Yes	Yes	Yes	Major	From SRIC, dummy variable (1 = Yes, 0 = No)
GENERAL	Yes	Yes	Yes	General Education	From SRIC, dummy variable (1 = Yes, 0 = No)
ELECTIVE	Yes	Yes	Yes	Elective	From SRIC, dummy variable (1 = Yes, 0 = No)
YEAR	Yes	Yes	Yes	Student year	From SRIC, freshman = 1; sophomore = 2; Junior = 3; senior = 4; graduate = 5
GRADE	Yes	Yes	Yes	Expected Grade	From SRIC, A = 4; B = 3; C = 2; D = 1; F = 0
SITE	No	No	Yes	Site Size	Number of registered students at each site
HOST	No	No	Yes	Host/Remote	Dummy variable (Host = 1, Remote = 0)
SAT	No	No	Yes	Satellite/EDNET	Dummy variable (Satellite = 1, EDNET = 0)

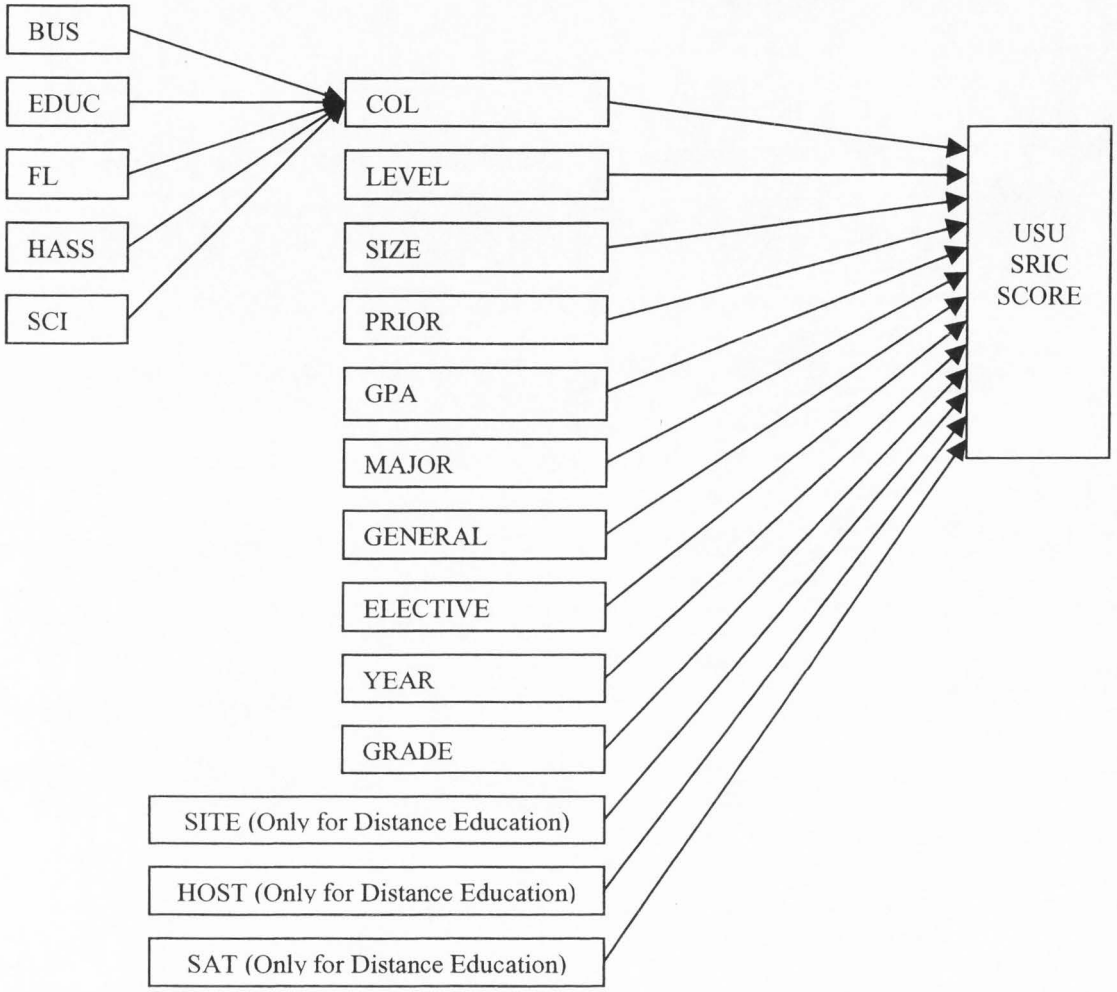

Figure 2. Noninstructional variables and USU SRIC.

(p. 274). Because the noninstructional variables of MAJOR, GENERAL, and ELECTIVE, HOST, and SAT consisted of only two categories (one vector), they were coded as "0" or "1" based on their memberships, and the zero-order correlation between these dummy-coded variables and SRIC were point biserial *r*s.

However, the categorical variable COL was treated differently, because it has five categories (i.e., more than two categories) to obtain the overall relationship of COL with USU SRIC. Pedhazur (1982) explained this procedure as follows:

> [B]ecause categorical variables that consist of more than two categories are represented by more than one coded vector, analyses with such variables must take this into account. For example, assume that multiple categorical variables are used in a predictive study and that it is desired to apply a variable-selection procedure. . . . Unless each of the variables consists of two categories only it is inappropriate to apply the variable-selection method to the coded vectors because each of them will be treated as a distinct variable. Instead, the selection needs to be applied to sets of coded vectors, each representing a given variable. (p. 383)

The five categories for the COL variable were Business [BUS], Education [EDUC], Family Life [FL], Humanities, Arts, and Social Sciences [HASS], and Science [SCI]. To avoid confusion with the COL variable, hereinafter the coded college categories are called vectors, as opposed to variables. First, the college categories were dummy coded. When a course was offered by BUS, SRIC forms were coded as "1," and SRIC forms from other colleges (i.e., EDUC, FL, HASS, and SCI) were coded as "0." EDUC, FL, and HASS dummy vectors were created in the same way as the BUS dummy vectors. However, an SCI dummy vector was not necessary, because SCI could be uniquely identified as a category by virtue of the zero values on the vectors of BUS, EDUC, FL, and HASS (Pedhazur & Schmelkin, 1991, pp. 465-466). Therefore, the COL variable had five categories represented by four dummy vectors.

Then R and R^2 were computed for on-campus, off-campus face-to-face, and distance education courses in order to determine the magnitude of the variance in USU SRIC AVG scores explained by COL. While obtaining the R and R^2, unstandardized predicted values of COL were computed for the on-campus, off-campus face-to-face, and distance education USU SRIC. These predicted values were treated as the COL variable for zero-order correlation.

The use of predicted dependent variable values as values for the independent variable is called criterion scaling (Pedhazur, 1982, pp. 387-392). Pedhazur explained criterion scaling as follows:

> The idea of criterion scaling is very simple.... the regression equation obtained from the regression of the dependent variable on a set of coded vectors yields predicted scores that are equal to the means of the group or categories on the dependent variable. . . . Therefore, by criterion scaling the categorical variable a multiple regression analysis can be replaced by a bivariate regression analysis in which the dependent variable is regressed on the criterion-scaled variable. This holds true regardless of the number of categories of the categorical variable and for equal as well as unequal n's. (p. 388)

With the five college dummy categories scaled as one noninstructional variable, COL, there were 10 noninstructional variables for on-campus and off-campus face-to-face courses (Table 7 and Figure 2). For distance education courses, with three distance education specific variables (SITE, HOST, and SAT; see Table 7, p. 70), there were 13 variables.[3]

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[3] Originally there were 14 variables, including an on-line course variable; however, the on-line variable was excluded due to limited data collection. Details are explained in a later section.

Multiple regression analysis. Multiple regression analyses were conducted to further investigate the association of the noninstructional variables with USU SRIC scores. Multiple regression analysis is well suited to examine the relationship between naturally occurring variables (Hatcher & Stepanski, 1994). The proportion of variance in SRIC explained by all of the noninstructional variables was indicated by R^2. The contribution of each noninstructional variable separately, holding constant the variance in common with the other noninstructional variables in the equation, was indicated by standardized regression coefficients (Beta weights). Standardized coefficients were used because the noninstructional variables were not on the same metric scale.

Multiple regression analysis was also used to compute unique indices. The unique index was defined by Hatcher and Stepanski (1994) as follows:

> the percentage [proportion] of variance in a criterion that is accounted for by a given predictor variable, above and beyond the variance accounted for by the other predictor variables in the equation. A uniqueness index is one measure of an X variable's importance as a predictor: the greater the amount of unique variance accounted for by a predictor, the greater its usefulness. (p. 407)

Marsh (1980) used this approach in his study. He explained the purpose as

> to determine the proportion of variance in the student ratings that could be uniquely explained by each of the background variables. This was accomplished by computing the proportion of variance that could be predicted by all but one of the background variables, and then determining the additional variance (the change in multiple R^2) that could be explained by the addition of the remaining variable. (pp. 222-223)

This unique index is also called the semipartial correlation coefficient (Marsh, p. 224).

Educational significance level. Because there was a lack of randomness in this study, tests of statistical significance were not conducted. The limitations of statistical significance testing and the use of effect sizes have been discussed in many papers (e.g.,

Carver, 1993; Fan, 2001; Shaver, 1991, 1993; Thompson, 1994). As the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001; APA) noted:

> Neither of the two types of probability value [a priori or exact probabilistic values] directly reflects the magnitude of an effect or the strength of a relationship. For the reader to fully understand the importance of your findings, it is almost always necessary to include some index of effect size or strength of relationship in your Results section. (p. 25)

In specific, in the APA Publication Manual (2001), it is suggested reporting effect sizes, such as "r^2, η^2, ω^2, R^2, ϕ^2, Cramer's V, Kendall's W, Cohen's d, and κ, Goodman-Kruskal's λ and γ" (p. 25).

As noted in the APA publication manual, Cohen (1988, p. 20) defined a standardized mean difference effect size, d, as:

$$d = \frac{M_A - M_B}{\sigma}$$ —that is, a parametric value computed from parameters.

Cohen noted that, given the homogeneity of variances assumption underlying the t-test, the standard deviation of either group could be used to estimate σ. However, given the frequent lack of validity of the homogeneity assumption and the desire to obtain the best estimate of variability by using all of the data available, the sample variances are commonly pooled to obtain an estimate of σ to use in computing d (Shaver, 1991, pp. 86-87). In this dissertation, however, the groups of students from whom data were collected were considered to be subgroups of an accessible population, not samples. Consequently, the standard deviations are σs, population parameters. Consistent with Cohen's formula, the population standard deviation—the standard deviation for the combined groups in each comparison—was used in computing ds.

Cohen (1988, pp. 24-27) defined small, medium, and large standardized mean differences as .2, .5, and .8, respectively. He also defined small, medium, and large *r*s as .10, .30, and .50 (r^2 = .01, .09, .25). However, Shaver (1991) pointed out that Cohen's criteria are "often used unthinkingly as indicators of educational significance" (p. 89). According to Shaver,

> Cohen's discussion of the magnitude of ESs stems from an essential step in power analysis – the stipulation of the magnitude of results (ES) that the researcher wants to detect at the specified level of probability (α). One approach has been to identify typical magnitudes of results in an area of research as the basis for the predesignated ES. . . . Cohen (1988, pp. 24-27) presented a careful rationale for specifying small, medium, and large ESs (for the SMD, .2, .5, and .8, respectively), based on typical findings in behavioral research and on the perceptibility of results. He cautioned, however (p. 12), that his magnitude-of-ES criteria, like all conventions, are arbitrary, even if based on reason. They may not be valid for other areas of research. (pp. 89-90)

As Shaver pointed out, Cohen's guidelines were not intended specifically for educational settings and also not specifically for SRIC research.

Guidelines for educational significance levels in SRIC research were considered by Marsh (1980). In his study of SRIC with 16 noninstructional variables, he set his criterion for practical significance at r^2 = .05—that is, 5% of the variance in SRIC explained or accounted for. He indicated that "correlations as small as r = .09 [can be] statistically significant, although of little practical significance. Consequently, attention was focused on those relationships that account for at least 5 % (approximately r > .23) of the variance in any one of the evaluation scores" (p. 223). Marsh's 5% criterion was used in this study to determine the educational significance level of r^2.

Marsh's 5% criterion (at least 5% of the total variance in SRIC explained) was also used to determine the educational significance level of R^2. Marsh (1980) did not

clearly state the criterion as an educational significance level for R^2; however, he did use that criterion to summarize the results of his study. Therefore, in order to be consistent with the zero-order correlational analysis (i.e., R^2 is the same as r^2, when there is only one predictor in the correlation analysis), Marsh's 5% criterion for educational significance was used for R^2.

Once the educational significance level of r^2 was decided, a parallel educational significance level would be defined for Cohen's *d*. According to Cohen (p. 23), the relationship between *r* and *d* can be expressed as:

$$r = \frac{d}{\sqrt{d^2 + 4}}$$

Based on Cohen's transformation formula, a *d* for which the proportion of variance accounted for by the corresponding r would be equal or greater than .05, is .46. This criterion was used to determine the educational significant of *d* throughout this study.

Analyses for Research Question 5

The fifth research question was, "Are there differences in the noninstructional variables-SRIC factor associations for on-campus and off-campus courses?" In this analysis, r^2, and R^2 values for noninstructional variables and USU SRIC scores were compared for on-campus, off-campus face-to-face, and distance education courses. In order to make interpretations of correlational differences straightforward, the criterion for educational significance utilized in this analysis was a 5% difference in the variance explained.

Shortcomings of Distance Education Research and This Study

As described earlier (p. 36 ff), in the IHEP report four key shortcomings in research on the teaching effectiveness in distance education were noted. In the following section, I discuss how these key shortcomings were dealt with in this study of on- and off- campus correlations between noninstructional variables and SRIC.

The first shortcoming, not showing cause and effect (IHEP, 1999, p. 3), was not relevant in this study, because the purpose was not to identify causal relationships.

The second shortcoming, lack of random sampling, was not relevant because the on-campus and distance education students were recognized as an accessible population and were not treated as samples. Conclusions were drawn about subgroups in the accessible population; however, tenuous inferences to broader target populations, such as USU students in other years or students at other universities, were not drawn.

The third shortcoming, assessment reliability and validity, was generally covered. As discussed in the prior chapters, the USU Course Evaluation was adapted from a well-established instrument developed at the University of Washington (see details, p. 59).

The fourth shortcoming was the lack of control of "reactive effects." Reactive effects were not relevant for this study because the data were collected using USU SRIC forms as part of the university's regular procedures. In other words, students and instructors were not in experimental settings. Therefore, reactive effects were controlled.

Criticisms of Distance Education Research Methodology

The IHEP report authors (1999) also listed seven criticisms of distance education research methodologies (see p. 37). The first criticism was, "The research has tended to emphasize student outcomes for individual courses rather than for a total academic program" (p. 5). This criticism was not relevant because the purpose of this study was not to investigate student outcomes for courses; it was to investigate student satisfaction with instructions.

The second criticism was, "The research does not take into account differences among [distance education] students" (IHEP, 1999, p. 5). This criticism was covered to some extent in this main study. As described earlier, various student characteristics were taken into account with the student-related noninstructional variables of major, student year, expected grade, prior interest, and current GPA (see page 28). How these noninstructional variables were associated with SRIC was investigated.

The third criticism was, "The research does not adequately explain why the drop-out rates of distance learners are higher" (IHEP, 1999, p. 5). The explanation of drop-out rates was not a purpose of this study. However, retention rates were calculated for distance education, on-campus, and off-campus face-to-face courses based on student registrations at the end of the semester as compared to study registrations at the third week of the semester. The retention rates were 97.1% (2,694 divided by 2,775, see Table 4, p. 45) for distance education courses; 98.2% (2,441 divided by 2,485, see Table 5, p. 51) for off-campus face-to-face courses; and 94.1% (3,777 divided by 4,015, see

Appendix A) for on-campus courses. Off-campus courses (distance education and off-campus face-to-face courses) had better retention rates than on-campus courses over the final 12 weeks of the 15-week semester.

The fourth criticism was, "The research does not take into consideration how the different learning styles of students relate to the use of particular technologies" (IHEP, 1999, p. 6). In the IHEP report, the authors pointed out:

> Understanding of how the learner, the learning task, and a particular technology interact is limited. Learner characteristics are a major factor in the achievement and satisfaction levels of the distance learner. Information regarding a student's preferred learning style will influence how the course is designed and the type of technology to be used. (p. 6)

This criticism was not taken into account in this study. Research on students' preferred learning styles could be a next step after this investigation of the relationship of SRIC and noninstructional variables.

The fifth criticism was, "The research focuses mostly on the impact of individual technologies rather than on the interaction of multiple technologies" (IHEP, 1999, p. 6). This study was planned to compare SRIC for different instructional technologies (e.g., satellite vs. EDNET courses); however, it was not planned to address the interaction of different instructional technologies. Therefore, the findings will not contribute to knowledge about SRIC for various instructional delivery systems in terms of interaction.

The sixth criticism was, "The research does not include a theoretical or conceptual framework" (IHEP, 1999, p. 6). The authors stated, "There is a vital need to develop a more integrated, coherent, and sophisticated program of research on distance learning that is based on theory" (p. 6). SRIC for on-campus courses have been investigated by many

researchers and well-established as a conceptual framework. However, SRIC for distance education courses have ndot beeninvestigated well, and there is no concrete foundation upon which to develop a theoretical or conceptual framework. Therefore, in this main study, I not only investigated SRIC and the noninstructional variables for distance education courses, but I also conducted a teacher immediacy study on a theory of teacher immediacy for distance education that study is discussed in a later section (p. 138 ff).

The seventh criticism was "The research does not adequately address the effectiveness of digital 'libraries'" (IHEP, 1999, p. 6). This criticism was not accounted for in this study; the effectiveness of digital libraries was not a part of the study.

CHAPTER IV

RESULTS: ON- AND OFF-CAMPUS SRIC COMPARISONS AND CORRELATIONS OF NONINSTRUCTIONAL VARIABLES AND SRIC

USU SRIC Form Descriptive Statistics and Correlations

Descriptive statistics for the USU SRIC items are shown in Table 8. "Distance" is the combination of the groups "Host" and "Remote"; "Off-campus" is the combination of the groups "Distance" and "Off-campus F2F"; "Total" is the combination of "Off-campus" and "On-campus." These group relationships are shown in Figure 1 (p. xvi). At the end of the table, the mean scores for all 20 items (AVG) are listed. In Figure 3, the means of each item for the on-campus, off-campus face-to-face, host, and remote groups are plotted.

The mean differences and *d*s for selected subgroups of the study population presented in Table 9 answer research question 1 in regard to on-campus versus off-campus SRIC. Despite the commonly reported finding that off-campus instruction receives lower SRIC, none of the *d*s for comparisons that included on-campus courses are educationally significant. The off-campus versus on-campus *d* is only .06, barely above zero, and the off-campus face-to-face versus on-campus *d* is .31, while the distance education versus on-campus *d* is -.20. Interestingly, the off-campus face-to-face versus distance education *d* of .52 is educationally significant.

Table 8

USU SRIC Results by Instructional Delivery System in Spring 2000

SRIC items		Host	Remote	Distance	Off-campus F2F	Off-campus	On-campus	Total
Total 1	Mean	4.97	4.58	4.63	5.15	4.88	4.77	4.80
	SD	1.01	1.15	1.14	0.93	1.08	1.01	1.03
	N	229	1,586	1,815	1,720	3,535	10,904	14,439
Total 2	Mean	5.04	4.60	4.66	5.20	4.92	4.87	4.89
	SD	1.06	1.26	1.24	0.99	1.16	1.11	1.12
	n	221	1,547	1,768	1,687	3,455	10,744	14,199
Course 1	Mean	4.95	4.60	4.64	5.01	4.82	4.79	4.80
	SD	1.00	1.18	1.17	1.04	1.12	1.05	1.07
	n	230	1,611	1,841	1,725	3,566	10,935	14,501
Course 2	Mean	5.15	4.76	4.81	5.21	5.00	4.93	4.95
	SD	0.90	1.11	1.09	0.92	1.03	1.02	1.02
	n	225	1,586	1,811	1,693	3,504	10,407	13,911
Course 3	Mean	5.13	4.69	4.75	5.17	4.95	4.92	4.93
	SD	0.91	1.17	1.15	0.93	1.07	1.03	1.04
	n	228	1,605	1,833	1,720	3,553	10,885	14,438
Course 4	Mean	5.03	4.61	4.66	5.04	4.84	4.78	4.79
	SD	0.95	1.18	1.17	1.02	1.12	1.09	1.10
	n	229	1,604	1,832	1,702	3,534	10,804	14,338
Course 5	Mean	4.98	4.62	4.67	5.07	4.87	4.77	4.80
	SD	1.14	1.23	1.22	1.06	1.16	1.14	1.15
	n	215	1,403	1,618	1,606	3,224	10,291	13,515
Course 6	Mean	5.07	4.77	4.80	5.19	4.99	4.80	4.85
	SD	1.06	1.12	1.12	0.96	1.06	1.15	1.13
	n	226	1,562	1,788	1,685	3,473	10,899	14,372
Course 7	Mean	4.95	4.70	4.73	5.10	4.91	4.88	4.89
	SD	1.05	1.13	1.12	1.02	1.09	1.03	1.04
	n	229	1,607	1,836	1,722	3,558	10,918	14,476

(*table continues*)

SRIC items		Host	Remote	Distance	Off-campus F2F	Off-campus	On-campus	Total
Course 8	Mean	5.00	4.55	4.61	5.07	4.83	4.71	4.74
	SD	1.00	1.26	1.24	1.02	1.16	1.13	1.14
	n	223	1,597	1,820	1,686	3,506	10,673	14,179
Inst 1	Mean	4.92	4.46	4.51	4.99	4.75	4.71	4.72
	SD	1.10	1.28	1.27	1.09	1.21	1.12	1.15
	n	228	1,604	1,832	1,715	3,547	10,915	14,462
Inst 2	Mean	5.23	4.67	4.74	5.24	4.98	4.91	4.93
	SD	0.96	1.26	1.24	0.97	1.15	1.11	1.12
	n	228	1,604	1,832	1,715	3,547	10,918	14,465
Inst 3	Mean	5.19	4.73	4.78	5.27	5.02	5.01	5.01
	SD	1.02	1.22	1.20	0.92	1.10	1.05	1.07
	n	226	1,600	1,826	1,708	3,534	10,874	14,408
Inst 4	Mean	5.05	4.54	4.61	5.17	4.88	4.91	4.91
	SD	1.09	1.31	1.30	1.03	1.21	1.11	1.13
	n	229	1,604	1,833	1,715	3,548	10,907	14,455
Inst 5	Mean	5.25	5.05	5.07	5.45	5.25	5.20	5.22
	SD	1.03	1.06	1.06	0.82	0.97	1.00	0.99
	n	227	1,579	1,806	1,691	3,497	10,820	14,317
Inst 6	Mean	5.17	4.71	4.77	5.26	5.01	4.93	4.95
	SD	0.99	1.23	1.21	0.97	1.13	1.09	1.10
	n	231	1,588	1,819	1,693	3,512	10,834	14,346
Inst 7	Mean	5.17	4.96	4.98	5.34	5.16	5.21	5.19
	SD	1.00	1.11	1.10	0.94	1.04	0.95	0.97
	n	229	1,587	1,816	1,698	3,514	10,888	14,402
Inst 8	Mean	5.24	4.79	4.85	5.39	5.11	5.08	5.09
	SD	0.96	1.17	1.15	0.88	1.06	1.00	1.01
	n	228	1,561	1,789	1,689	3,478	10,794	14,272
Inst 9	Mean	5.31	4.81	4.87	5.41	5.13	5.08	5.09
	SD	0.95	1.16	1.15	0.87	1.06	1.04	1.04
	n	228	1,602	1,830	1,708	3,538	10,894	14,432

(*table continues*)

SRIC items		Host	Remote	Distance	Off-campus F2F	Off-campus	On-campus	Total
Inst 10	Mean	4.99	4.36	4.44	5.16	4.79	4.90	4.87
	SD	1.13	1.34	1.33	1.03	1.25	1.11	1.14
	n	216	1,509	1,725	1,664	3,389	10,564	13,953
AVG[a]	Mean	5.10	4.68	4.73	5.19	4.96	4.91	4.92
	SD	0.83	1.00	0.99	0.80	0.93	0.87	0.89
	n	226	1,566	1,792	1,689	3,481	10,724	14,205

Note. See p. 56 for the point values.
[a]AVG = the mean of all 20 items.

Table 9

USU SRIC Mean Differences and ds for Selected Population Subgroups

Subgroups	Mean difference	d[a]
Off-Campus minus On-Campus	.05	.06
Off-Campus F2F minus On-Campus	.28	.31
Distance minus On-Campus	-.18	-.20
Off-Campus F2F minus Distance	.46	.52
Host minus Remote	.42	.47

[a]SD_{TOTAL}= .89 was used to compute *d*s.

The correlation matrix of Pearson product moment *r*s is shown in Table 10. The upper-right triangle contains on-campus correlation coefficients, and the lower-left triangle contains correlation coefficients for off-campus face-to-face and distance courses (bold). As in Table 8, the mean score for all 20 items (AVG) is listed as the last variable in Table 10.

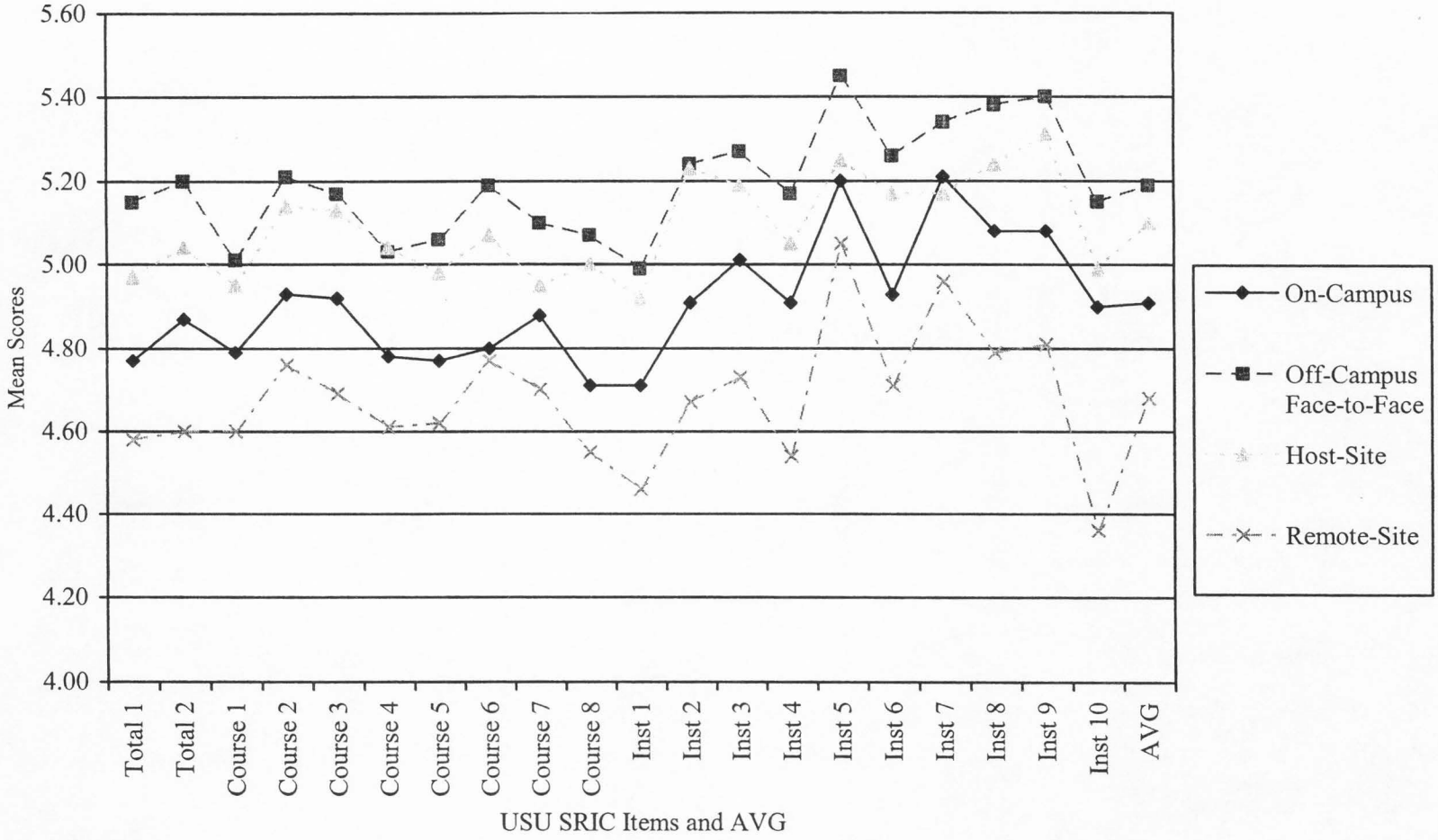

Figure 3. Means of USU SRIC items for on-campus, off-campus face-to-face, host, and remote groups.

Table 10

USU SRIC Form Item Intercorrelations

	Total 1	Total 2	C1	C2	C3	C4	C5	C6	C7	C8	Ins1	Ins2	Ins3	Ins4	Ins5	Ins6	Ins7	Ins8	Ins9	Ins10	AVG
Total 1		.82	.72	.67	.73	.64	.68	.64	.68	.63	.77	.72	.71	.71	.65	.71	.64	.61	.61	.60	.86
Total 2	.84		.70	.63	.73	.60	.65	.62	.66	.59	.78	.79	.77	.78	.70	.76	.71	.63	.63	.62	.87
	.86																				
Course 1	.76	.75		.68	.74	.63	.68	.64	.77	.60	.73	.66	.65	.66	.57	.66	.62	.59	.57	.59	.83
	.76	**.75**																			
Course 2	.72	.68	.71		.72	.71	.67	.64	.69	.64	.68	.61	.62	.63	.55	.61	.58	.57	.56	.56	.80
	.72	**.71**	**.75**																		
Course 3	.75	.74	.77	.74		.64	.72	.63	.70	.63	.74	.68	.71	.72	.60	.67	.64	.59	.58	.58	.84
	.78	**.78**	**.78**	**.78**																	
Course 4	.67	.63	.65	.72	.65		.65	.68	.66	.61	.65	.60	.59	.60	.53	.59	.54	.54	.53	.52	.77
	.66	**.64**	**.67**	**.77**	**.68**																
Course 5	.72	.69	.72	.70	.73	.66		.69	.70	.61	.67	.61	.62	.62	.54	.61	.57	.55	.55	.56	.80
	.70	**.70**	**.72**	**.70**	**.73**	**.68**															
Course 6	.68	.66	.68	.67	.64	.69	.70		.68	.60	.65	.60	.59	.59	.53	.62	.54	.57	.55	.57	.78
	.65	**.65**	**.66**	**.66**	**.63**	**.69**	**.71**														
Course 7	.73	.71	.80	.71	.72	.68	.71	.71		.62	.71	.65	.63	.65	.56	.65	.62	.59	.58	.58	.82
	.71	**.71**	**.79**	**.73**	**.71**	**.68**	**.74**	**.72**													
Course 8	.65	.65	.65	.69	.66	.66	.68	.66	.68		.65	.58	.58	.58	.50	.58	.52	.53	.52	.54	.74
	.70	**.68**	**.68**	**.70**	**.71**	**.67**	**.71**	**.64**	**.68**												
Inst 1	.80	.80	.77	.72	.74	.68	.69	.68	.76	.70		.75	.75	.76	.63	.73	.68	.62	.62	.63	.87
	.80	**.81**	**.78**	**.75**	**.78**	**.68**	**.72**	**.66**	**.74**	**.74**											
Inst 2	.71	.76	.70	.68	.70	.64	.65	.67	.71	.67	.77		.79	.78	.68	.84	.70	.71	.71	.66	.87
	.75	**.80**	**.71**	**.69**	**.73**	**.63**	**.69**	**.67**	**.71**	**.66**	**.77**										
Inst 3	.72	.76	.71	.70	.72	.62	.68	.64	.69	.65	.76	.80		.76	.73	.75	.72	.65	.65	.61	.85
	.76	**.82**	**.71**	**.70**	**.77**	**.63**	**.67**	**.63**	**.68**	**.68**	**.80**	**.82**									
Inst 4	.73	.78	.72	.69	.70	.66	.67	.66	.72	.64	.78	.79	.76		.67	.78	.72	.67	.64	.62	.85
	.77	**.81**	**.72**	**.70**	**.76**	**.66**	**.69**	**.65**	**.70**	**.67**	**.79**	**.80**	**.80**								
Inst 5	.62	.67	.59	.59	.60	.53	.53	.56	.59	.55	.64	.71	.74	.67		.68	.73	.62	.63	.58	.78
	.64	**.68**	**.61**	**.60**	**.61**	**.52**	**.57**	**.56**	**.61**	**.54**	**.64**	**.67**	**.70**	**.65**							
Inst 6	.68	.72	.69	.65	.65	.62	.64	.68	.70	.63	.73	.83	.74	.78	.69		.70	.77	.73	.69	.87
	.74	**.79**	**.71**	**.69**	**.73**	**.65**	**.68**	**.69**	**.72**	**.66**	**.76**	**.86**	**.79**	**.79**	**.65**						
Inst 7	.67	.72	.65	.62	.64	.55	.56	.59	.67	.57	.73	.74	.72	.75	.71	.70		.63	.63	.60	.80
	.68	**.72**	**.65**	**.63**	**.66**	**.57**	**.63**	**.61**	**.68**	**.59**	**.72**	**.73**	**.74**	**.73**	**.75**	**.70**					
Inst 8	.60	.62	.59	.59	.56	.57	.55	.62	.61	.56	.64	.75	.67	.68	.61	.78	.62		.84	.68	.79
	.62	**.63**	**.59**	**.58**	**.59**	**.59**	**.61**	**.61**	**.61**	**.56**	**.62**	**.70**	**.64**	**.66**	**.57**	**.76**	**.58**				
Inst 9	.60	.61	.57	.58	.57	.55	.54	.60	.59	.54	.63	.72	.66	.66	.64	.75	.64	.84		.63	.78
	.61	**.62**	**.57**	**.57**	**.57**	**.55**	**.58**	**.61**	**.58**	**.54**	**.60**	**.69**	**.63**	**.64**	**.58**	**.72**	**.58**	**.88**			
Inst 10	.62	.65	.62	.61	.58	.59	.57	.61	.62	.61	.66	.71	.63	.67	.57	.74	.61	.74	.68		.76
	.66	**.66**	**.64**	**.61**	**.63**	**.60**	**.61**	**.63**	**.63**	**.60**	**.67**	**.71**	**.66**	**.67**	**.56**	**.75**	**.59**	**.71**	**.67**		
AVG	.86	.87	.85	.83	.84	.79	.81	.81	.85	.79	.89	.88	.86	.87	.76	.87	.81	.79	.77	.78	
	.88	**.89**	**.86**	**.84**	**.86**	**.79**	**.83**	**.80**	**.85**	**.80**	**.89**	**.89**	**.88**	**.88**	**.76**	**.89**	**.81**	**.76**	**.77**	**.79**	

Note. The upper right triangle contains on-campus, and the lower left triangle contains off-campus F2F and distance courses (bold).

Factor Analyses

Factor Extraction

Tables 11, 12, and 13 show initially estimated eigenvalues using the maximum likelihood method for on-campus, off-campus face-to-face, and distance education courses, respectively. Also, the scree plots for the three instructional delivery groups in Figure 4 show the values of initially estimated eigenvalues on each factor.

Based on the scree plots in Figure 4, one factor would be the appropriate number to retain for each instructional delivery group: All of the groups had extremely high eigenvalues on the first factor and the rest of factors tended to line up as a scree line. On the other hand, based on the Kaiser criterion (i.e., eigenvalues greater than 1), two factors can be extracted for on-campus and off-campus face-to-face courses. However, for distance education SRIC, only one factor had an eigenvalue greater than 1, but the eigenvalue for the second factor was .89.

According to Stevens (1996), the Kaiser criterion yields reliable results "*when the number of variables is < 30 and the communalities are > .70, or when N > 250 and the mean communality is > .60*" (p. 367, italics in the original). In this study, the number of variables was 20, the *N*s were 10,724 from on-campus, 1,689 from off-campus face-to-face, and 1,792 from distance education courses. As shown in Table 14, the initially estimated communalities in on-campus, off-campus face-to-face, and distance education courses analyses were mostly more than .60. Therefore, these results meet Steven's reliability criteria.

Table 11

Initially Estimated Eigenvalues by the Maximum Likelihood Method for On-Campus Courses

Factors	Eigenvalues	% of Variance	Cumulative %
1	13.47	67.34	67.34
2	1.10	5.51	72.84
3	0.68	3.38	76.23
4	0.45	2.24	78.47
5	0.43	2.17	80.64
6	0.41	2.04	82.68
7	0.39	1.93	84.61
8	0.35	1.77	86.38
9	0.34	1.68	88.06
10	0.32	1.58	89.64
11	0.26	1.32	90.96
12	0.26	1.32	92.28
13	0.24	1.20	93.48
14	0.23	1.15	94.63
15	0.22	1.10	95.72
16	0.20	1.00	96.73
17	0.19	0.96	97.69
18	0.17	0.83	98.51
19	0.16	0.79	99.30
20	0.14	0.70	100.00

Table 12

Initially Estimated Eigenvalues by the Maximum Likelihood Method for Off-Campus Face-to-Face Courses

Factors	Eigenvalues	% of Variance	Cumulative %
1	13.93	69.63	69.63
2	1.06	5.28	74.91
3	0.66	3.32	78.23
4	0.46	2.32	80.55
5	0.40	1.98	82.52
6	0.36	1.80	84.33
7	0.35	1.74	86.07
8	0.33	1.64	87.71
9	0.30	1.50	89.21
10	0.29	1.43	90.64
11	0.27	1.33	91.97
12	0.24	1.20	93.16
13	0.22	1.09	94.26
14	0.21	1.06	95.31
15	0.19	0.95	96.27
16	0.18	0.88	97.15
17	0.17	0.84	97.98
18	0.14	0.72	98.70
19	0.13	0.66	99.35
20	0.13	0.65	100.00

Table 13

Initially Estimated Eigenvalues by the Maximum Likelihood Method for Distance Education Courses

Factors	Eigenvalues	% of Variance	Cumulative %
1	14.39	71.95	71.95
2	0.89	4.44	76.39
3	0.72	3.61	80.01
4	0.48	2.41	82.42
5	0.37	1.87	84.29
6	0.35	1.74	86.03
7	0.33	1.64	87.67
8	0.29	1.47	89.14
9	0.27	1.36	90.50
10	0.26	1.32	91.82
11	0.23	1.16	92.98
12	0.20	1.00	93.97
13	0.19	0.96	94.94
14	0.18	0.90	95.84
15	0.17	0.86	96.69
16	0.16	0.82	97.51
17	0.15	0.73	98.25
18	0.13	0.66	98.90
19	0.12	0.58	99.49
20	0.10	0.51	100.00

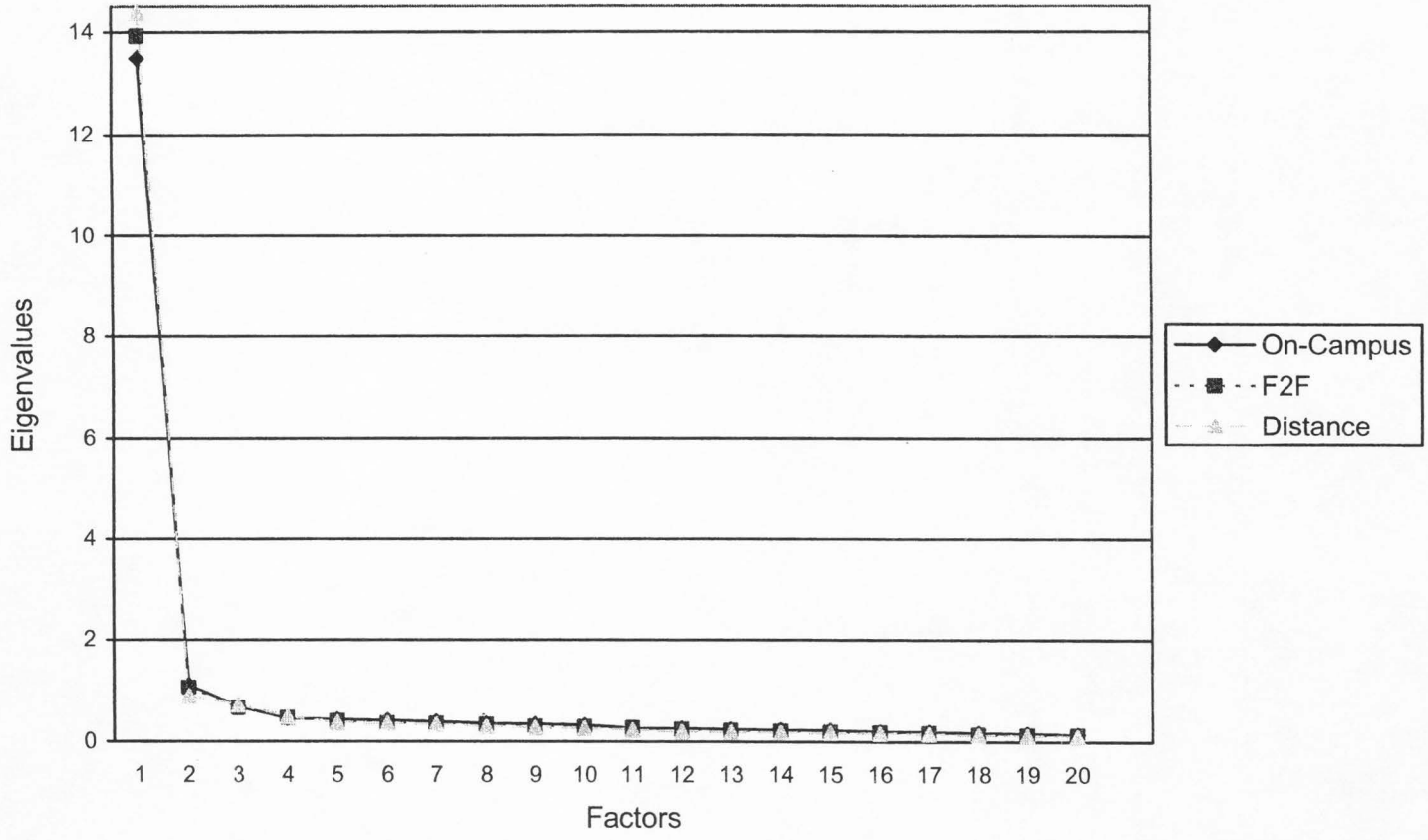

Figure 4. Scree plot for eigenvalues.

Table 14

Initially Estimated Communalities by Maximum Likelihood Method for Three Educational Delivery Groups

Items	ON[a]	OFF[b]	DIS[c]
I. General Evaluation			
Total 1: The overall quality of this course was	.75	.80	.79
Total 2: The instructor's effectiveness in teaching the subject matter was	.79	.83	.80
II. Information About the Course			
Course 1: The extent to which course objectives were clear was	.71	.76	.77
Course 2: Relevance of assignments to course content was	.67	.77	.72
Course 3: Relevance of material presented in class to course goal(s) was	.73	.77	.74
Course 4: Appropriateness of workload to course goal(s) was	.63	.70	.66
Course 5: Relevance of exams to course goal(s) was	.65	.70	.68
Course 6: Fairness of course grading procedures was	.63	.68	.67
Course 7: The extent to which course responsibilities of students were clarified was	.71	.76	.74
Course 8: Helpfulness of assigned texts/readings to achieving course goal(s) was	.57	.69	.64
III. Information About the Instruction			
Inst 1: The extent which course organization helped learning was	.76	.80	.80
Inst 2: The helpfulness of explanations by the instructor, if/when needed was	.80	.83	.81
Inst 3: Instructor's use of examples, if/when appropriate, was	.75	.82	.76
Inst 4: Instructor's use of class time to help students learn the subject matter was	.75	.78	.77
Inst 5: Instructor's enthusiasm for subject of course was	.64	.70	.65
Inst 6: Instructor's helpfulness in resolving student's questions was	.80	.83	.80
Inst 7: The extent to which the instructor was prepared for class was	.67	.73	.69
Inst 8: Opportunity to ask questions was	.77	.83	.80
Inst 9: Opportunity for students to make comments and express opinions was	.74	.81	.76
Inst 10: Availability of extra help, if/when needed, was	.57	.63	.64

[a]On-campus courses. [b]Off-campus face-to-face courses. [c]Distance education courses.

Following the Kaiser criterion, two factors were rotated for the on-campus and off-campus face-to-face groups delivery groups to obtain as much meaningful information from the data as possible. For consistency in analysis and interpretation, two factors were kept for factor rotation for the distance education group as well.

Tables 15, 16, and 17 show the factor loadings (factor-variable correlations) for the two extracted factors and the communalities by the maximum likelihood extraction method for on-campus, off-campus face-to-face, and distance education courses, respectively. As shown in these tables, the first two factors accounted for 69.74%, 72.25%, and 74.05% of the total variance in the USU SRIC form items on on-campus, off-campus face-to-face, and distance education courses, respectively. And, when only two factors were retained, the eigenvalues on the second factor turned out to be smaller than 1.00 for all three instructional delivery groups.

Oblique Factor Rotations

Oblique factor rotations (promax) were conducted to investigate interfactor correlations, because the items on the USU SRIC were highly correlated with each other (see Table 10, p. 87) and high correlations between the two factors were assumed. In fact, the interfactor correlations were high—.81, .80, and .78 for on-campus, off-campus face-to-face, and distance education courses, respectively. The matrices from the oblique rotation are presented in Tables 18 and 19. Table 18 shows the factor structure matrices from the promax factor rotations. All factor loadings (Table 18) were extremely high: the range was from .65 to .95.

Table 15

Factor Loadings and Communalities for the Two Extracted Factors for On-Campus Courses

Items	Factors		Communalities
	Factor 1	Factor 2	
I. General Evaluation			
Total 1: The overall quality of this course was	.85	.10	.73
Total 2: The instructor's effectiveness in teaching the subject matter was	.87	-.06	.76
II. Information About the Course			
Course 1: The extent to which course objectives were clear was	.82	.22	.72
Course 2: Relevance of assignments to course content was	.78	.27	.69
Course 3: Relevance of material presented in class to course goal(s) was	.84	.19	.74
Course 4: Appropriateness of workload to course goal(s) was	.75	.27	.63
Course 5: Relevance of exams to course goal(s) was	.78	.27	.68
Course 6: Fairness of course grading procedures was	.76	.23	.63
Course 7: The extent to which course responsibilities of students were clarified was	.82	.24	.72
Course 8: Helpfulness of assigned texts/readings to achieving course goal(s) was	.73	.21	.58
III. Information About the Instruction			
Inst 1: The extent which course organization helped learning was	.87	.07	.76
Inst 2: The helpfulness of explanations by the instructor, if/when needed was	.88	-.22	.82
Inst 3: Instructor's use of examples, if/when appropriate, was	.85	-.14	.75
Inst 4: Instructor's use of class time to help students learn the subject matter was	.86	-.13	.75
Inst 5: Instructor's enthusiasm for subject of course was	.77	-.18	.62
Inst 6: Instructor's helpfulness in resolving student's questions was	.87	-.23	.82
Inst 7: The extent to which the instructor was prepared for class was	.80	-.15	.66
Inst 8: Opportunity to ask questions was	.79	-.23	.68
Inst 9: Opportunity for students to make comments and express opinions was	.78	-.23	.66
Inst 10: Availability of extra help, if/when needed, was	.74	-.09	.56
Eigenvalues	13.16	0.79	
% of variance	65.80	3.94	
% cumulative variance		69.74	

Table 16

Factor Loadings and Communalities for the Two Extracted Factors for Off-Campus Face-to-Face Courses

Items	Factors		Communalities
	Factor 1	Factor 2	
I. General Evaluation			
Total 1: The overall quality of this course was	.85	.21	.77
Total 2: The instructor's effectiveness in teaching the subject matter was	.86	.14	.76
II. Information About the Course			
Course 1: The extent to which course objectives were clear was	.84	.24	.77
Course 2: Relevance of assignments to course content was	.83	.18	.72
Course 3: Relevance of material presented in class to course goal(s) was	.83	.24	.75
Course 4: Appropriateness of workload to course goal(s) was	.78	.14	.63
Course 5: Relevance of exams to course goal(s) was	.79	.22	.67
Course 6: Fairness of course grading procedures was	.79	.09	.64
Course 7: The extent to which course responsibilities of students were clarified was	.83	.20	.74
Course 8: Helpfulness of assigned texts/readings to achieving course goal(s) was	.78	.12	.61
III. Information About the Instruction			
Inst 1: The extent which course organization helped learning was	.89	.14	.81
Inst 2: The helpfulness of explanations by the instructor, if/when needed was	.89	-.14	.81
Inst 3: Instructor's use of examples, if/when appropriate, was	.86	.00	.74
Inst 4: Instructor's use of class time to help students learn the subject matter was	.87	.00	.75
Inst 5: Instructor's enthusiasm for subject of course was	.76	-.11	.59
Inst 6: Instructor's helpfulness in resolving student's questions was	.87	-.24	.82
Inst 7: The extent to which the instructor was prepared for class was	.80	-.04	.63
Inst 8: Opportunity to ask questions was	.82	-.41	.83
Inst 9: Opportunity for students to make comments and express opinions was	.80	-.39	.79
Inst 10: Availability of extra help, if/when needed, was	.77	-.21	.64
Eigenvalues	13.64	0.81	
% of variance	68.21	4.04	
% cumulative variance		72.25	

Table 17

Factor Loadings and Communalities for the Two Extracted Factors for Distance Education Courses

Items	Factors		Communalities
	Factor 1	Factor 2	
I. General Evaluation			
Total 1: The overall quality of this course was	.87	.17	.80
Total 2: The instructor's effectiveness in teaching the subject matter was	.88	.15	.83
II. Information About the Course			
Course 1: The extent to which course objectives were clear was	.85	.19	.76
Course 2: Relevance of assignments to course content was	.83	.20	.77
Course 3: Relevance of material presented in class to course goal(s) was	.85	.22	.77
Course 4: Appropriateness of workload to course goal(s) was	.78	.12	.70
Course 5: Relevance of exams to course goal(s) was	.81	.15	.70
Course 6: Fairness of course grading procedures was	.79	.05	.68
Course 7: The extent to which course responsibilities of students were clarified was	.84	.15	.76
Course 8: Helpfulness of assigned texts/readings to achieving course goal(s) was	.81	.16	.69
III. Information About the Instruction			
Inst 1: The extent which course organization helped learning was	.88	.20	.80
Inst 2: The helpfulness of explanations by the instructor, if/when needed was	.90	-.02	.83
Inst 3: Instructor's use of examples, if/when appropriate, was	.88	.12	.82
Inst 4: Instructor's use of class time to help students learn the subject matter was	.88	.09	.78
Inst 5: Instructor's enthusiasm for subject of course was	.78	.10	.70
Inst 6: Instructor's helpfulness in resolving student's questions was	.91	-.07	.83
Inst 7: The extent to which the instructor was prepared for class was	.81	.10	.73
Inst 8: Opportunity to ask questions was	.84	-.44	.83
Inst 9: Opportunity for students to make comments and express opinions was	.82	-.43	.81
Inst 10: Availability of extra help, if/when needed, was	.79	-.13	.64
Eigenvalues	14.07	0.74	
% of variance	70.34	3.71	
% cumulative variance		74.05	

Table 18

Factor Structure Matrix After Promax (Oblique) Rotation

	On-campus		Off-campus face-to-face		Distance education	
Items	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
I. General Evaluation						
Total 1	.83	.79	.87	.71	.88	.70
Total 2	.80	.86	.87	.74	.89	.73
II. Information About the Course						
Course 1	.85	.73	.87	.69	.87	.68
Course 2	.83	.68	.85	.70	.85	.65
Course 3	.85	.75	.86	.68	.87	.66
Course 4	.79	.65	.79	.67	.78	.65
Course 5	.82	.67	.82	.64	.82	.66
Course 6	.79	.67	.79	.70	.78	.68
Course 7	.85	.72	.86	.69	.86	.69
Course 8	.76	.65	.78	.67	.82	.65
III. Information About the Instruction						
Inst 1	.84	.82	.89	.77	.90	.70
Inst 2	.75	.90	.82	.87	.87	.81
Inst 3	.76	.86	.83	.79	.89	.73
Inst 4	.76	.86	.84	.80	.87	.75
Inst 5	.66	.79	.70	.74	.78	.66
Inst 6	.74	.90	.78	.90	.87	.84
Inst 7	.70	.81	.76	.75	.81	.68
Inst 8	.67	.82	.69	.91	.72	.95
Inst 9	.65	.81	.67	.88	.70	.93
Inst 10	.67	.74	.69	.80	.74	.76

Table 19

Factor Pattern Matrix After Promax (Oblique) Rotation

	On-campus		Off-campus face-to-face		Distance education	
Items	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
I. General Evaluation						
Total 1	.55	.34	.85	.04	.85	.04
Total 2	.31	.60	.75	.14	.83	.08
II. Information About the Course						
Course 1	.75	.12	.90	-.03	.86	.01
Course 2	.82	.02	.79	.07	.86	-.02
Course 3	.71	.18	.89	-.03	.90	-.04
Course 4	.79	.01	.71	.10	.71	.10
Course 5	.81	.01	.83	-.01	.77	.06
Course 6	.74	.06	.63	.20	.63	.19
Course 7	.78	.09	.83	.03	.80	.07
Course 8	.69	.09	.67	.14	.79	.04
III. Information About the Instruction						
Inst 1	.52	.39	.78	.15	.89	.01
Inst 2	.05	.86	.35	.60	.60	.34
Inst 3	.17	.72	.54	.37	.79	.12
Inst 4	.18	.71	.55	.37	.74	.18
Inst 5	.06	.74	.30	.50	.68	.13
Inst 6	.02	.89	.19	.75	.53	.43
Inst 7	.13	.70	.44	.40	.70	.14
Inst 8	-.01	.83	-.10	.99	-.04	.98
Inst 9	-.03	.83	-.10	.96	-.04	.96
Inst 10	.19	.58	.17	.66	.37	.47

The factor pattern matrices from the promax factor rotations are shown in Table 19. Due to the high interfactor correlations, the factor pattern matrices showed extremely different loading patterns from the structure matrices: when the variance in common with the other factors was removed (i.e., partialled out), the magnitude of the factor elements for each SRIC item dropped to much lower levels. Of particular importance, consistent with the lower eigenvalues for Factor 2 when only two factors were extracted, the results from the pattern matrices indicate that the use of two factors for USU SRIC interpretations may not be appropriate. In the following section, the oblique factor rotations are interpreted for the three instructional delivery groups, using the elements in the factor structure matrices as the factor loadings and the factor pattern matrices as supportive elements in interpretation.

On-campus courses. It can be seen in Table 18 that although the difference in loadings are small, the two factors closely approximate the Course and Instruction subsections of the USU SRIC instrument sections for the on-campus courses. The loadings in the structure matrix for the two factors are almost identical to the two sections of the USU SRIC form; items in the first section loaded slightly more on Factor 1, and items in the second section loaded slightly more on Factor 2.

However, one item (INST 1) does not fit the pattern of loadings and seems to be misplaced on the form. The structure matrix shows factor loadings for INST 1 of .84 and .82 on Factor 1 and Factor 2, respectively (Table 18). Moreover, INST 1 has factor pattern elements of .52 on Factor 1 and .39 on Factor 2 for on-campus courses (Table 19). Although INST 1, "The extent to which course organization helped learning was," is in

the "Information About the Instruction" section of the USU SRIC form, it was loaded higher on Factor 1, which encompassed "Information About the Course" items.

As previously mentioned, the USU SRIC form was adapted from IAS forms from the University of Washington. Interestingly, some of the IAS forms (five forms out of eight) had an item, "The organization of this course was," which was categorized in the section of "to provide diagnostic feedback to the instructor." There were three IAS sections: "to provide a general evaluation," "to provide information about the course to other students," and "to provide diagnostic feedback to the instructor," which correspond to the USU SRIC sections of "general evaluation," "information about the course," and "information about instruction," respectively. The categorization of this item in the "Information About Instruction" section on the USU SRIC form seemed to be based on the IAS format. However, the IAS form was changed in 1995, after USU adopted IAS as the basis for its SRIC instrument (see Appendix C). Now the University of Washington IAS forms have no sections. No supportive documentation could be located for the decision to no longer group items in sections.

In factor analysis, a critical decision is which items to consider to be contributors to each factor, based on their factor loadings. In the initial factor extraction solution (Table 15), all items had high loadings on Factor 1 and low loadings on Factor 2; however, after oblique factor rotation (Table 18), all items had moderate to high loadings on both factors.

Table 20 was created to facilitate comparison of factor loadings between Factor 1 and Factor 2 across the on-campus, off-campus face-to-face, and distance education courses. Based on the structure matrices shown in Table 18, checkmarks indicate the

factor on which each item loaded the higher. For example, in Table 18, Total 1 was loaded .83 and .79 on Factor 1 and Factor 2, respectively, for on-campus courses. Because the item was loaded higher on Factor 1, a checkmark was assigned to Factor 1 in Table 20. The checkmark pattern in Table 20 also indicates results from the factor pattern matrix in Table 19; checkmarks indicate: (a) higher factor loadings in Table 19, and (b) factor elements over .50 in Table 18. Checkmarks in parentheses indicate the factor elements were less than .50 in Table 18.

Based on Table 20, the first factor was labeled the Course factor, because all items from the "Information about the Course" section and INST 1 were loaded on it. The rest of the items from the "Information about Instruction" sections were loaded on the second factor, so it was named the Instruction factor. The two overall items (TOTAL 1 & TOTAL 2) had loadings on both of the two factors for on-campus courses; however, TOTAL 1 had a somewhat higher loading on the Course factor (.83 vs. .79) and TOTAL 2 had a somewhat higher loading on the Instruction factor (.80 vs. .86, see Table 18). The elements in the pattern matrix were even more striking— .55 versus .34 and .31 versus .60 for factors 1 and 2, respectively.

Off-campus face-to-face courses. As for the on-campus courses, the off-campus face-to-face factor loadings for both TOTAL 1 and TOTAL 2 were very high (Table 18). However, both TOTAL 1 and TOTAL 2 were loaded higher on Factor 1 than on Factor 2. This different distribution of overall items between on-campus and off-campus face-to-face courses can be also seen in the factor pattern matrix: Factor 1 for off-campus face-to-face courses contains both course (TOTAL 1) and instruction (TOTAL 2) items, as is clearly shown in Table 19. The factor pattern elements were high on Factor 1 (.85 and

Table 20

Summary of Oblique Factor Rotations for On-Campus, Off-Campus Face-to-Face, and Distance Education Courses

		On-campus		Off-campus face-to-face		Distance education	
Items		Factor 1 (Course)	Factor 2 (Instruction)	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ instructor availability	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ helpfulness)
I. General Evaluation							
Total 1	The overall quality of this course was	√		√		√	
Total 2	The instructor's effectiveness in teaching the subject matter was		√	√		√	
II. Information About the Course							
Course 1	The extent to which course objectives were clear was	√		√		√	
Course 2	Relevance of assignments to course content was	√		√		√	
Course 3	Relevance of material presented in class to course goal(s) was	√		√		√	
Course 4	Appropriateness of workload to course goal(s) was	√		√		√	
Course 5	Relevance of exams to course goal(s) was	√		√		√	
Course 6	Fairness of course grading procedures was	√		√		√	
Course 7	The extent to which course responsibilities of students were clarified was	√		√		√	
Course 8	Helpfulness of assigned texts/readings to achieving course goal(s) was	√		√		√	

(*table continues*)

Items		On-campus		Off-campus face-to-face		Distance education	
		Factor 1 (Course)	Factor 2 (Instruction)	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ instructor availability	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ helpfulness)
Inst 1	The extent which course organization helped learning was	√		√		√	
Inst 2	The helpfulness of explanations by the instructor, if/when needed was		√		√	√	
Inst 3	Instructor's use of examples, if/when appropriate, was		√	√		√	
Inst 4	Instructor's use of class time to help students learn the subject matter was		√	√		√	
Inst 5	Instructor's enthusiasm for subject of course was		√		√	√	
Inst 6	Instructor's helpfulness in resolving student's questions was		√		√	√	
Inst 7	The extent to which the instructor was prepared for class was		√	(√)		√	
Inst 8	Opportunity to ask questions was		√		√		√
Inst 9	Opportunity for students to make comments and express opinions was		√		√		√
Inst 10	Availability of extra help, if/when needed, was		√		√		(√)

Note. Check marks indicate (a) higher factor loadings in Table 18, and (b) factor elements over .50 in Table 19. Check marks in parentheses indicate the factor elements were less than .50 in Table 19.

.75 for TOTAL 1 and TOTAL 2, respectively), but extremely low on Factor 2 (.04 and .14 for TOTAL 1 and TOTAL 2, respectively).

The off-campus face-to-face factor loadings for other items were also not totally consistent with those for on-campus courses. As shown in Tables 18 and 20, INST 3, INST 4, and INST 7, which were about use of examples, use of class time to help students' learning, and class preparation, were loaded higher on Factor 1, in addition to INST 1. Also, INST 8, INST 9, and INST 10, which were about interaction opportunities or the availability of instructors, were loaded much higher on Factor 2 than they were for the on-campus courses (Table 18).

For on-campus courses, Factor 1 and Factor 2 were labeled as a Course factor and an Instruction factor, respectively. However, Factor 1 and Factor 2 for off-campus face-to-face courses were better named as a Course/Instruction factor and an Interaction Opportunity/Instructor Availability factor, respectively.

Distance education courses. For distance education courses, TOTAL 1 and TOTAL 2 were both loaded on the first factor (see Table 18). As with the off-campus face-to-face courses analysis, the first factor tends to contain elements of both course and instruction; however, the difference in factor loadings on TOTAL 1 and TOTAL 2 between on-campus and distance education courses is more distinguishable than the difference between on-campus and off-campus face-to-face courses.

Even though the results for all three instructional delivery groups are consistent in that the "Information about Course" items (COURSE 1 through 8) and INST 1 have high loadings on Factor 1, other items, such as INST 2, INST 3, INST 4, INST 5, INST 6, and INST 7, had higher loadings on Factor 1 for distance education courses than for on-

campus courses. These "Information about Instruction" items (INST 2, INST 3, INST 4, INST 5, INST 6, and INST 7) are related to in-class instruction, and the "Information about Course" items (COURSE 1 through 8) and INST 1 are related to course structure. This tendency for Factor 1 loadings can also be observed in Table 19 in the factor pattern matrix. Therefore, Factor 1 for distance education courses could be named a Course/Instruction factor, as for the off-campus face-to-face courses.

On the other hand, as shown in Table 18, INST 8 and INST 9 loaded higher on Factor 2 than Factor 1 for distance education courses (.95 for INST 8 and .93 for INST 9). This tendency can be clearly observed in the factor pattern matrix in Table 19. Factor 2 elements on these two items were extremely high (.98 for INST 8 and .96 for INST 9), while their Factor 1 elements were extremely low (-.04 for both INST 8 and INST 9); only INST 8 and INST 9 had high elements on Factor 2.

Why did INST 8 and INST 9 load relatively high on Factor 1 (.72 for INST 8 and .70 for INST 9) in the factor structure matrix (Table 18), while they loaded extremely low on Factor 1 (-.04 for both INST 8 and INST 9) in the factor pattern matrix (Table 19)? This is only because there is a high correlation between Factor 1 and Factor 2 (r = .78). Pedhazur and Schmelkin (1991) explained as follows:

> The Pattern Matrix consists of loadings analogous to partial standardized regression coefficients (β's) in a multiple regression analysis..., whereas the Structure Matrix consists of zero-order correlations between each indicator and the factors. . . . Consistent with the interpretation of β's [in a multiple regression analysis], each coefficient in the Pattern Matrix indicates the effect of a given factor on a given indicator, while partialing out or controlling for the other factor(s). (p. 616)

Therefore, "Depending on the correlation between the factors, the Pattern and Structure matrices may be radically different from each other" (Pedhazur & Schmelkin, 1991, p. 617). Only when the factors are not correlated will the two matrices be identical.

The factor pattern matrix (Table 19) also indicates that for distance education courses, INST 10 loaded some on Factor 2 (.47), even though the loading pattern is not quite as clear as for INST 8 and INST 9. INST 10 asks about the "Availability of extra help, if/when needed" and it is similar to the INST 8, "Opportunity to ask questions," and INST 9, "Opportunity for students to make comments and express opinions." Both items deal with the availability of interaction with the instructor when needed. In other words, students in distance education courses tended to rate INST 8, INST 9, and INST 10 (i.e., interaction availability with instructor) differently than the Course/Instruction factor. Based on the results for distance education courses, the second factor was titled, Interaction Opportunities/Helpfulness factor.

The distance education loadings are consistent with the results from the study by Chamberlain (1999). She found educationally significant mean differences between the mean USU SRIC of on-campus English 101 students and on-line English 101 students on items INST 8, INST 9, and INST 10.

Varimax Factor Rotation

With the high interfactor correlations, orthogonal factor rotations might be considered inappropriate. However, orthogonal factor rotations were conducted in order to examine further the factors in this study. Factor 1 and Factor 2 were rotated using the

Varimax orthogonal rotation method. Table 21 contains the eigenvalues and percentages of variance explained after rotation.

As shown in Table 15, 16, and 17 (see p. 95 ff), after extraction, the second factor added only 3.94%, 4.04%, and 3.71% to the explained variance, while the first factor explained 65.80%, 68.21%, and 70.34% of the total variance for on-campus, off-campus face-to-face, and distance education courses, respectively. After the Varimax rotation, the total variance explained was more evenly distributed between the two factors for each instructional delivery group (see Table 21).

As expected, factor loadings on Factor 1 and Factor 2 after Varimax rotations (Table 22) were not as high as the loadings after oblique rotations; however, they are not simple to interpret. Pedhazur and Schmelkin (1991) discussed the selection of criteria for uncorrelated (orthogonal) factor loadings as follows:

Table 21

Total Variance Explained Following Varimax Rotation With Two Factors

Delivery groups	Factor	Eigenvalues	% of Variance	Cumulative %
On-campus	1	7.13	35.63	35.63
	2	6.82	34.11	69.74
Off-campus face-to-face	1	8.37	41.86	41.86
	2	6.08	30.39	72.25
Distance Education	1	9.79	48.97	48.97
	2	5.02	25.08	74.05

Table 22

Factor Loadings After Varimax Rotation

	On-campus		Off-campus face-to-face		Distance education	
Items	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
I. General Evaluation						
Total 1	.65	.56	.77	.41	.79	.40
Total 2	.55	.68	.74	.46	.78	.43
II. Information About the Course						
Course 1	.72	.45	.79	.37	.78	.38
Course 2	.73	.39	.74	.42	.77	.36
Course 3	.71	.48	.78	.37	.80	.35
Course 4	.70	.36	.68	.41	.68	.39
Course 5	.73	.38	.73	.36	.72	.39
Course 6	.69	.39	.65	.46	.65	.45
Course 7	.73	.43	.76	.40	.75	.41
Course 8	.65	.39	.66	.42	.73	.38
III. Information About the Instruction						
Inst 1	.64	.59	.76	.48	.81	.39
Inst 2	.44	.79	.58	.69	.69	.57
Inst 3	.48	.72	.64	.57	.77	.45
Inst 4	.49	.72	.65	.57	.74	.48
Inst 5	.39	.68	.49	.58	.67	.41
Inst 6	.42	.80	.50	.75	.66	.62
Inst 7	.44	.68	.57	.56	.69	.43
Inst 8	.37	.73	.35	.84	.38	.87
Inst 9	.36	.73	.34	.82	.37	.85
Inst 10	.44	.61	.44	.67	.54	.59

> Obviously, the criterion of what is a high loading is arbitrary. Many researchers prefer to speak of meaningful, instead of high, loadings. Further, because, in most instances, researchers report and interpret loadings for uncorrelated factors, they tend to use a cutoff of .3 (accounting for 9% of the variance) or .4 (accounting for 16% of the variance) for what they consider meaningful loadings. Whatever the specific criterion, it is the high, or meaningful, loadings that play a crucial role in the interpretation and the naming of factors. (p. 603)

If the factor loading criterion were set at .3 for this study, all USU SRIC items would be loaded, that is, "meaningful," on both factors. Even if the cutoff were set at .4, most of the loadings would be higher than the cutoff. In other words, the widely used criteria are not helpful for the USU SRIC data. Using a higher criterion, .55, Table 23 was created, similar to Table 20 for the oblique factor rotations. Checked marks indicate items with a factor loading $\geq .55$. Using the .55 cut off, the Varimax rotation results were similar to and consistent with the oblique rotation results.

There are, however, too many high loadings on both factors in the rotated solution, reflecting the interfactor correlations, and the factor rotation did not make the results more interpretable as compared to the initial solution.

Summary of Factor Analyses

The factorial structure of items on the USU SRIC forms was investigated for on-campus, off-campus face-to-face, and distance education courses separately. Using maximum likelihood factor extraction, two highly correlated factors were extracted for each group and then rotated obliquely. The rotations yielded inconsistent factor patterns across the three groups. Orthogonal rotations were also conducted, but added no additional information.

Table 23

Comparisons Based on Varimax Factor Rotation for On-Campus, Off-Campus Face-to-Face, and Distance Education Courses

Items		On-campus		Off-campus face-to-face		Distance education	
		Factor 1 (Course)	Factor 2 (Instruction)	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ instructor availability	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ helpfulness)
I. General Evaluation							
Total 1	The overall quality of this course was	√	(√)	√		√	
Total 2	The instructor's effectiveness in teaching the subject matter was	(√)	√	√		√	
II. Information About the Course							
Course 1	The extent to which course objectives were clear was	√		√		√	
Course 2	Relevance of assignments to course content was	√		√		√	
Course 3	Relevance of material presented in class to course goal(s) was	√		√		√	
Course 4	Appropriateness of workload to course goal(s) was	√		√		√	
Course 5	Relevance of exams to course goal(s) was	√		√		√	
Course 6	Fairness of course grading procedures was	√		√		√	
Course 7	The extent to which course responsibilities of students were clarified was	√		√		√	
Course 8	Helpfulness of assigned texts/readings to achieving course goal(s) was	√		√		√	

(*table continues*)

Items		On-campus		Off-campus face-to-face		Distance education	
		Factor 1 (Course)	Factor 2 (Instruction)	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ instructor availability	Factor 1 (Course/ interaction)	Factor 2 (Interaction opportunity/ helpfulness)
Inst 1	The extent which course organization helped learning was	√		√		√	
Inst 2	The helpfulness of explanations by the instructor, if/when needed was		√	(√)	√	√	(√)
Inst 3	Instructor's use of examples, if/when appropriate, was		√	√	(√)	√	
Inst 4	Instructor's use of class time to help students learn the subject matter was		√	√	(√)	√	
Inst 5	Instructor's enthusiasm for subject of course was		√		√	√	
Inst 6	Instructor's helpfulness in resolving student's questions was		√		√	√	(√)
Inst 7	The extent to which the instructor was prepared for class was		√	√	(√)	√	
Inst 8	Opportunity to ask questions was		√		√		√
Inst 9	Opportunity for students to make comments and express opinions was		√		√		√
Inst 10	Availability of extra help, if/when needed, was		√		√		√

Note. A check mark in parentheses indicates that although the loading was .55 or larger, it was smaller than the loading for the item on the other factor in Table 22.

For all of the course-related items (COURSE 1 through 8), the loadings were higher on the first factor for on-campus, off-campus face-to-face, and distance education courses. However, for the instruction-related items (INST 1 through 10), the loading patterns were inconsistent among the three groups.

The grouping of items on the current USU SRIC form was closely similar to the factor-loading pattern for on-campus courses. Based on the results, it can be concluded that the USU SRIC items, except for INST 1, were appropriately sorted into the subgroups, "General Evaluation," "Information About the Course," and "Information About the Instruction," for on-campus courses.

However, different factorial structures were identified for the ratings from off-campus face-to-face and distance education courses. Two factors were found from the factor analyses and named as "Course/Instruction" and "Interaction Opportunities/Instructor Availability" for off-campus face-to-face courses, and "Course/Instruction" and "Interaction Opportunities/Helpfulness" for distance education courses.

The results for the "Interaction Opportunities/Helpfulness" items suggest a need for investigation of the USU SRIC form for off-campus use. In particular, items might be added to or replaced on the USU SRIC form to better reflect off-campus students' satisfaction and perceptions of teaching effectiveness in their courses. Because SRIC have been used as a proxy for teaching effectiveness, it would be important to investigate if the USU SRIC items were appropriate for off-campus use.

Factor-based scores. Even though the factor analyses yielded interesting results, two limitations affected the initial plan to use factor loadings to generate factor-based

scores for further analyses: inconsistencies in factor patterns across the on-campus, off-campus face-to-face, and distance education courses, and extremely high interfactor correlations. The inconsistencies in factor patterns made it infeasible to obtain factor-based scores for further correlation analyses, as score composition would be different for the on-campus, off-campus face-to-face, and distance education courses. And, in any event, with interfactor correlations of .81, .80, and .78, respectively, the factor loadings would not make distinctive contributions to factor scores. Consequently, the mean for all 20 USU SRIC items (AVG) was considered for use as the dependent variable in further analyses, instead of factor-based scores. Although use of AVG might result in some loss of information from the factor loadings, as shown in Table 10 (p. 87) the correlations between the USU SRIC mean score (AVG) and the USU SRIC item scores were very strong; most of them were in the .80s, ranging from .74 to .89. Based on these correlation coefficients, the mean score was used for further analysis.

Zero-Order Correlational Analyses

Research questions 2, 3, and 4 asked if selected noninstructional variables were associated with the identified factors of the USU SRIC in on-campus, off-campus face-to-face, and distance education courses. Those questions are now revised to substitute "USU SRIC mean scores" for "identified factors."

With one exception, Pearson product moment correlation coefficients were calculated for 10 noninstructional variables and the USU SRIC mean score (AVG) for on-campus and off-campus face-to-face courses, and for 13 USU noninstructional variables and AVG for distance education courses. The exception is the correlations with

college (COL). They are multiple *R*s, with dummy coding for the five college groups. A large number of students did not respond to one or two USU SRIC items (or answered N/A), so AVG scores were based on 18 or more items. The correlations are presented in Table 24.

On-Campus Courses

GRADE (student's expected grade) was the only noninstructional variable that had an educationally significant relationship with USU SRIC mean score (AVG). The correlation was .26 for on-campus, indicating a small, positive relationship. With $r^2 = .07$, GRADE and AVG had 7% of their variance in common. PRIOR (prior interest) had a weak, not educationally significant, relationship with AVG, ($r = .12$, $r^2 = .01$), and SIZE (class sizes) had a weak negative relationship with AVG ($r = -.12$, $r^2 = .01$).

As expected based on the literature review, there were some moderate to strong correlations among the noninstructional variables. For example, the association between YEAR (student year) and LEVEL (course level) was positive and strong ($r = .58$).

Off-Campus Face-to-Face Courses

Again, the only educationally significant correlation with AVG was found for GRADE (Table 24); expected grade had a small, positive relationship with mean score ($r = .28$, $r^2 = .08$). Again, SIZE (class size) and PRIOR (prior interest) had weak, not educationally significant relationships with mean score ($r = -.17$, $r^2 = .03$; $r = .12$, $r^2 = .01$, respectively). Smaller class-size students tended to rate their instructors higher, and ratings tended to be higher as prior interest was higher. This result was consistent with on-campus results.

Table 24

Correlations Among Noninstructional Variables and USU SRIC Average

	AVG	LEVEL	SIZE	PRIOR	GPA	MAJOR	GENE	ELEC	YEAR	GRADE	COL	SITE	HOST	SAT
AVG		.06	-.12	.12	.05	-.04	.04	.03	.00	.26	.10	n/a	n/a	n/a
LEVEL	.05 **-.06**		-.22	.19	.16	.37	-.35	-.08	.58	.21	.29	n/a	n/a	n/a
SIZE	-.17 **-.02**	-.07 **-.37**		.00	-.02	.05	-.04	-.05	-.12	-.14	-.17	n/a	n/a	n/a
PRIOR	.12 **.17**	.14 **.12**	-.13 **-.11**		.11	.14	-.22	.10	.10	.22	.17	n/a	n/a	n/a
GPA	.05 **.04**	.26 **.37**	.04 **-.15**	.09 **.12**		.07	-.10	.03	.11	.41	.09	n/a	n/a	n/a
MAJOR	-.03 **-.04**	.35 **.22**	.00 **.01**	.08 **.01**	.13 **.04**		-.73	-.26	.32	.01	-.04	n/a	n/a	n/a
GENERAL	-.04 **.07**	-.45 **-.45**	.08 **.19**	-.17 **-.09**	-.17 **-.17**	-.64 **-.51**		-.15	-.41	-.03	-.05	n/a	n/a	n/a
ELECTIVE	.06 **.00**	-.10 **-.01**	-.07 **-.07**	.11 **.03**	.01 **-.01**	-.25 **-.26**	-.18 **-.09**		.01	.03	.18	n/a	n/a	n/a
YEAR	.04 **-.09**	.74 **.78**	-.07 **-.30**	.08 **.03**	.25 **.34**	.33 **.21**	-.46 **-.47**	-.04 **-.01**		.09	.14	n/a	n/a	n/a
GRADE	.28 **.24**	.24 **.33**	-.08 **-.16**	.23 **.25**	.39 **.49**	.07 **.02**	-.10 **-.12**	.06 **.01**	.22 **.28**		.23	n/a	n/a	n/a
COL	.11 **.17**	.10 **-.29**	-.13 **-.19**	.15 **.02**	.02 **-.09**	-.07 **-.19**	.00 **.20**	.10 **.02**	.03 **-.16**	.18 **.01**		n/a	n/a	n/a
SITE	n/a **-.09**	n/a **-.02**	n/a **.33**	n/a **-.02**	n/a **-.09**	n/a **.04**	n/a **.02**	n/a **.02**	n/a **-.06**	n/a **.01**	n/a **-.13**		n/a	n/a
HOST	n/a **.14**	n/a **.03**	n/a **-.09**	n/a **.03**	n/a **-.04**	n/a **.12**	n/a **-.07**	n/a **-.02**	n/a **.07**	n/a **.06**	n/a **.16**	n/a **.26**		n/a
SAT	n/a **.02**	n/a **-.29**	n/a **.07**	n/a **-.05**	n/a **-.13**	n/a **-.08**	n/a **.11**	n/a **.04**	n/a **-.24**	n/a **-.11**	n/a **.07**	n/a **.00**	n/a **.04**	

Note. The upper right triangle contains on-campus, and the lower left triangle contains off-campus F2F and distance courses (bold). Correlations with COL are multiple *R*s, with dummy coding for the five college groups.
The underlined coefficients were educationally significant (i.e., $r \geq .22$).
Pairwise sample sizes are: Max = 11,114, Min = 10,252 for on-campus; Max = 1,737, Min = 1,483 for off-campus F2F; Max = 1,852, Min = 1,654 for distance courses.

Distance Education Courses

Again, the one educationally significant correlation with AVG was found for GRADE ($r = .24$, $r^2 = .06$). Three other noninstructional variables had small correlation coefficients that were not educationally significant: PRIOR, COL, and HOST had $r = .17$, .17, and .14, respectively.

Summary. Expected grade (GRADE) was the only variable with an educationally significant relationship (r) with SRIC (AVG), and the relationship was consistent across all three groups.

Multiple Regression Analyses

Multiple regression analyses were conducted to determine if all of the noninstructional variables together would correlate higher with AVG than any one noninstructional variable. In the analyses, AVG was used as the dependent variable and 10 or 13 noninstructional variables were used as independent variables.

On-campus courses. Altogether, the 10 noninstructional variables accounted for approximately 9% of the variance in AVG scores ($R = .30$, $R^2 = .09$, see Table 25) for the on-campus courses. The R is educationally significant.

Beta weights (standardized multiple regression coefficients) are also presented in Table 25. The noninstructional variables ranked from most to least important as predictors in the multiple regression analysis were as follows: GRADE, SIZE, PRIOR, GENERAL, GPA, ELECTIVE, COL, YEAR, MAJOR, and LEVEL.

Table 25

Multiple Rs, Beta Weights, and Unique Indices (U) for Mean SRIC Scores (AVG) Regressed on Noninstructional Variables

USU noninstructional variables	On-campus		Off-campus F2F		Distance education	
	Beta	*U*	Beta	*U*	Beta	*U*
COL	.02	.00	.03	.00	.11	.01
LEVEL	.01	.00	-.02	.00	.05	.00
SIZE	-.08	.01	-.14	.02	.08	.00
PRIOR	.08	.01	.04	.00	.11	.01
GPA	-.06	.00	-.05	.00	-.05	.00
MAJOR	.01	.00	-.08	.00	.00	.00
GENERAL	.07	.00	-.06	.00	.03	.00
ELECTIVE	.02	.00	-.01	.00	.00	.00
YEAR	-.02	.00	-.01	.00	-.15	.01
GRADE	.25	.05	.27	.06	.27	.05
SITE					-.15	.02
HOST					.16	.02
SAT					.00	.00
R (R^2)	.30	(.09)	.33	(.11)	.38	(.15)

GRADE had an unique index of .05 in the multiple regression analysis. That is, it added 5% to the explained variance when included in the regression equation after all of the other variables. All of the other USU noninstructional variables had unique indices of .01 or less. The magnitude of the unique index for GRADE (U = .05) indicated that more than half of the variance in AVG explained by the multiple R (R^2 = .09) was accounted for uniquely by the GRADE noninstructional variable. This is consistent with the zero-order r^2 values for GRADE and AVG, which ranged from .06 to .08.

Off-Campus Face-to-Face Courses

For off-campus face-to-face courses, the 10 noninstructional variables accounted for approximately 11% of the variance in AVG (R = .33, R^2 = .11), which was educationally significant. R^2 was approximately 2% points greater than for on-campus courses. Based on the beta weights, GRADE made the largest contribution to the AVG scores for off-campus face-to-face courses, followed by SIZE, MAJOR, GENERAL, GPA, PRIOR, COL, LEVEL, ELECTIVE, and YEAR.

The unique index for GRADE was .06, which was much larger than other indices (see Table 25). The second largest unique index was .02 for SIZE, and the other indices were .01 or less.

Distance Education Courses

For distance education courses, there were three additional noninstructional variables, SITE, HOST, and SAT. The 13 variables accounted for 15% of the variance in AVG (R = .38, R^2 = .15), which was educationally significant. The magnitude of R^2 for distance education courses was larger than for on-campus with a difference (.06) that was

educationally significant. The difference with the off-campus face-to-face courses approached educationally significance (R^2 = .04). The beta weights in Table 25 show that, again, GRADE was the variable most highly associated with AVG scores. The second variable was HOST, followed by YEAR, SITE, PRIOR, COL, SIZE, LEVEL, MAJOR, ELECTIVE, SAT, ELECTIVE, and GENERAL.

In the unique index analysis, as expected from the zero-order correlation analysis, GRADE had the largest percentage of variance in AVG (.05) beyond the variance accounted for by the other 12 noninstructional variables.

Summary. In the multiple regression analyses, 9%, 11%, and 15% of the variance in USU SRIC mean scores for on-campus, off-campus face-to-face, and distance education courses, respectively, was explained by the entire set of noninstructional variables, and the explained variance was educationally significant. Also, unique index results confirmed the educationally significant relationship between USU SRIC mean scores and expected grade in all of the three groups.

On- and Off-Campus Course Comparisons

Research Question 5 was, "Are there any differences in the noninstructional-SRIC associations for on-campus and off-campus courses?" Table 26 displays the correlation coefficients for AVG and noninstructional variables for the on-campus, off-campus face-to-face, and distance education courses, and the differences between r^2s and R^2s. None of the differences in noninstructional variable-AVG r^2s for the three educational delivery groups were educationally significant; all were smaller than .05. The difference in R^2

Table 26

Squared Correlation Coefficients for AVG and Noninstructional Variables and Differences Between r^2 and R^2s Among the Three Instructional Delivery Groups

	Squared correlation coefficients			Differences between r^2		
Noninstructional variables	On-campus	Off-campus face-to-face	Distance education	D^a_{ON-F2F}	D^b_{ON-DIS}	$D^c_{F2F-DIS}$
LEVEL	.00	.00	.00	.00	.00	.00
SIZE	.02	.03	.00	-.02	.02	.03
PRIOR	.02	.02	.03	.00	-.01	-.02
GPA	.00	.00	.00	.00	.00	.00
MAJOR	.00	.00	.00	.00	.00	.00
GENERAL	.00	.00	.00	.00	.00	.00
ELECTIVE	.00	.00	.00	.00	.00	.00
YEAR	.00	.00	.01	.00	-.02	-.02
GRADE	.07	.08	.06	-.01	.01	.02
COL	.01	.01	.03	.00	-.02	-.02
SITE			.01			
HOST			.02			
SAT			.00			
R^2	.09	.11	.15	-.02	-.06	-.04

[a]Difference between r^2 for on-campus and off-campus face-to-face courses. [b]Difference between r^2 for on-campus and distance education courses. [c]Difference between r^2 for off-campus face-to-face and distance education courses.

between on-campus and distance education courses (Table 26) was educationally significant.

Summary of Regression Analysis

Three instructional delivery groups were investigated in order to find out whether there were educational significant relationships between USU SRIC average scores and noninstructional variables. Only expected grade (GRADE) had an educationally significant relationship with USU SRIC mean scores (AVG) for on-campus, off-campus face-to-face, and distance education courses. There were educationally significant R^2s between the noninstructional variables and USU SRIC mean scores for all three groups, but the only educationally significant unique index was for GRADE in each group.

In the next chapter, I report study of social presence as a correlate of SRIC, conducted prior to the main study reported above, as a precursor to reporting a study of teacher immediacy in distance education that was conducted after the main study.

CHAPTER V

SOCIAL PRESENCE STUDY

Prior to the major study reported above, I studied the relationship between social presence and SRIC in distance education courses. In the Review of Literature chapter, correlations from that study between the noninstructional variables (host/remote and site size) and SRIC were presented (see pp. 32, 34). In this chapter, the full study is described as a lead-in to a teacher immediacy study that was conducted after the main study of SRIC and noninstructional variables.

Social presence was defined by Short, Williams, and Christie (1976) as "the degree to which he [an instructor in the case of educational settings] is perceived as a 'real person'" (p. 73). Social presence was discussed by Short et al. as follows:

> [T]he degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships is an important hypothetical construct that can usefully be applied more generally. We shall term this quality "Social Presence." This critical concept needs further clarification. We regard Social Presence as being a quality of the communications medium. Although we would expect it to affect the way individuals perceive their discussions, and their relationships to the persons with whom they are communicating, it is important to emphasize that we are defining Social Presence as a quality of the medium itself. (p. 65)

This somewhat vague definition of social presence was derived from their view of the conceptual development of interaction efficiency and nonverbal (i.e., immediacy) communication. Short et al. (1976) stated as follows:

> Although the initial motivation for the study of the differences between communications media was an interest in the practical implications of a wide-scale switch from face-to-face towards mediated communication, the area does also have implications for the study of social interaction . . . . The [efficiency, non-verbal (i.e., immediacy), and social presence] theories [of the effects of

> varying media of communication] can be considered hierarchical, in that while the later ones take into account all the factors allowed for in the earlier ones, they also extend their scope to include other processes and new phenomena. The earlier two theories, the 'efficiency' and the 'non-verbal' theories, have been implicit in the previously published literature; the third, the 'Social Presence' account, is relatively novel. (p. 61)

The theory of social presence was used to investigate student satisfaction and teaching effectiveness in distance education courses by Gunawardena and Zittle (1997). They found that social presence scores were an effective predictor of student satisfaction scores ($r^2 = .60$) in an on-line conference course taken by students from several universities. This course was based on group interaction, rather than a traditional lecture format, where an instructor plays the role of a facilitator rather than the role of the information source.

In a typical distance education course, however, the teacher is still the main source of information rather than a facilitator. Furthermore, the typical distance education course includes the use of visual aids, such as full motion video delivered to students. Therefore, the correlation of social presence scores with SRIC in typical distance education courses could be different from those in Gunawardena and Zittle's (1997) study.

Purposes of the Social Presence Study

The purposes of the social presence study were to investigate whether there were any educationally significant differences between the remote- and host-site groups or any educationally significant relationships between students' social presence scores, SRIC, and the noninstructional variables of remote/host sites and site size. Specifically, the following research questions were investigated:

1. Is there any difference in mean SRIC scores between the remote- and host-site groups?

2. Is there any difference in mean social presence scores between the remote- and host-site groups?

3. Is any association between SRIC scores and social presence scores educationally significant?

4. Is any association between SRIC scores and the number of students at sites educationally significant?

5. Is any association between social presence scores and the number of students at sites educationally significant?

Method

Participants. The participants were 318 students in eight distance education courses at USU in summer and fall 1999 (see Table 27). Within two to three weeks before the end of each quarter, I sent out e-mails or faxes to course instructors asking for their participation in my study. Only 8 instructors out of 35 agreed to participate in this study.

Instrumentation. The questionnaire for this study had 51 items grouped in five sections: instruction/instructor characteristics (INST); technological characteristics (TECH); course management and coordination (MNGM); satisfaction (SATIS); and

Table 27

Participants by Class and by Remote and Host Sites

Class	Number of remote sites	Number of responses		
		Remote	Host	Total
PSY1010 (General Psychology)	14	40	3	43
PSY2800 (Psychological Statistics)	6	8	3	11
CHEM1010 (Introduction to Chemistry)	8	21	5	26
CS1720 (Computer Science II)	4	5	4	9
ACCT2010 (Survey of Accounting I)	11	83	5	88
PSY3510 (Social Psychology)	19	43	3	46
HEP3000 (Elementary Health Education)	14	36	3	39
PSY6660 (Cognition and Instruction)	9	50	6	56
Total		286	32	318

social presence (SOCP). The questionnaire was developed by adapting three survey forms: the Telecourse Evaluation Questionnaire (TEQ) reported by Biner (1993), the USU SRIC form, and the Social Presence Scale (Gunawardena & Zittle, 1997; see Table 28).

The TEQ form has three rating sections; (a) instruction/instructor characteristics (INST); (b) technological characteristics (TECH); and (c) course management and coordination (MNGM), and these sections have 16 items, 7 items, and 11 items, respectively. These three TEQ sections were adapted by adding or deleting items. For the INST section, two TEQ items were replaced with three USU SRIC items. The TEQ original item, "the instructor's organization and preparation for class," was replaced with

Table 28

Questionnaire Used in This Social Presence Study

Item name	Item description
Instruction/instructor characteristics (INST)	
INST 1	The clarity with which the class assignments were communicated
INST 2	The typical amount of time the prepared graphics (e.g., graphs, tables, pictures, outlines, notes, etc.) were left on the screen to be copied down
INST 3	The degree to which the prepared (computer-generated) graphics helped you gain a better understanding of the course material
INST 4	The production quality of the prepared graphics used for the class
INST 5	The timeliness with which papers, tests, and written assignments were graded and returned
INST 6	The degree to which the types of instructional techniques that were used to teach the class (e.g., lectures, demonstrations, group discussions case studies) helped you gain a better understanding of the class material
INST 7	The extent to which the room in which the class was held was free of distraction (e.g., noise from adjacent rooms, people coming in and out, other students talking with each other)
INST 8	The extent to which the instructor made the students at different sites feel that they were part of the class (belonged)
INST 9	The instructor's communication skills
INST 10	The extent to which course organization helped learning
INST 11	The instructor's enthusiasm for subject of course
INST 12	The instructor's teaching ability
INST 13	The extent to which the instructor encouraged class participation
INST 14	The in-person/telephone accessibility of the instructor outside of class
INST 15	The extent to which the instructor was prepared for class
INST 16	The instructor's professional behavior
INST 17	Overall, this instructor was
Technological characteristics (TECH)	
TECH 1	The quality of the television picture
TECH 2	The quality of the television sound

(*table continues*)

Item name	Item description
TECH 3	The adequacy of the screen size of the television set that received the class broadcasts
TECH 4	The clarity of the tele-response system audio
TECH 5	The brevity of the talkback delays when communicating with the instructor over the tele-response system
TECH 6	The promptness with which the instructor recognizes and answers students calls over the tele-response system
TECH 7	The degree of confidence you have that classes will not be temporarily interrupted or cancelled due to technical problems on inclement weather
Course management and coordination (MNGM)	
MNGM 1	Your reaction to the present means of material exchange between you and the course instructor
MNGM 2	The accessibility of science labs (answer only if laboratory work was required for your class)
MNGM 3	Your ability to access a library when, and if, you needed
MNGM 4	Your ability to access a computer when, and if, you needed
MNGM 5	The general conscientiousness of the site coordinator (e.g., in delivering materials, unlocking room doors, tuning in broadcasts)
MNGM 6	The accessibility of the site coordinator
MNGM 7	The degree to which the site class or someone at the site was able to operate the television and tele-response system on the first day (or night) of class
MNGM 8	The promptness with which class materials were delivered/sent to either you or the site
MNGM 9	The timing with which the television pictures were switched between several views without disturbing your concentration of study
MNGM 10	The promptness with which a back-up tape of a class session was delivered in the event of broadcast failure or a poor broadcast
MNGM 11	Your ability to access departmental program personnel when needed
MNGM 12	Class enrollment and registration procedures
Social presence scale (SOCP)	
SOCP 1	Lectures were impersonal
SOCP 2	Lectures are an excellent medium for social interaction
SOCP 3	I felt comfortable conversing through this medium
SOCP 4	I felt comfortable introducing myself on the system
SOCP 5	The introductions enabled me to form a sense of online community

(*table continues*)

Item name	Item description
SOCP 6	I felt uncomfortable participating in discussions
SOCP 7	The instructor created a feeling of an online community
SOCP 8	The instructor facilitated discussions in the class
SOCP 9	Courses tend to be more impersonal than face-to-face courses
SOCP 10	I felt comfortable interacting with other participants in the class
SOCP 11	I felt that my point of view was acknowledged by other participants in the class
SOCP 12	I was able to form distinct individual impressions of some participants even though we communicated only via a medium
Satisfaction (SATIS)	
SATIS 1	I was able to learn through this medium
SATIS 2	I was stimulated to do additional reading or research on topics discussed in the class
SATIS 3	This system was a useful learning experience

two USU SRIC items: "The extent to which course organization helped learning" and "The extent to which the instructor was prepared for class." Also the TEQ item, "The instructor's general level of enthusiasm" was replaced with the USU SRIC item, "The instructor's enthusiasm for subject of course was." As a result, there were 17 INST items. No change was made on the original TEQ TECH section; however, one item, "The timing with which the television pictures were switched between several views without disturbing your concentration of study" was added to the MNGM section. A 7-point Likert scale was used for the INST (17 items), TECH (7 items), and MNGM (12 items), with choices ranging from "extremely poor" to "extremely good." The three categories (INST, TECH, and MNGM) were used as SRIC subcategories.

The social presence (SOCP) and satisfaction with the course (SATIS) sections were adapted from the Social Presence Scale by Gunawardena and Zittle (1997).

Originally, Gunawardena and Zittle (1997) developed the scale for their on-line conference course for students from several universities. Some wordings that were not appropriate for satellite-based distance education courses were modified. For example, the original question, "I felt comfortable introducing myself on GlobalEd," was changed to "I felt comfortable introducing myself on the system." A 7-point Likert scale, with choices ranging from "strongly disagree" to "strongly agree," was used for SOCP (12 items) and SATIS (3 items).

Procedures. Within the final two weeks of each quarter, the questionnaire was administered to the students. Permission to administer the instrument was obtained from each course instructor. Prior to the administration, the questionnaires were sent to each site from the distance education administration office. The questionnaire was handed out by site coordinators. After completion, the questionnaires were handed in to the site coordinators and sent back to the distance education administration office. Participation was voluntary and 69% of the registered students completed the questionnaire.

Analysis. The dependent variables were the individual students' mean scores on the five sections of the questionnaire— INST, TECH, MNGM, SOCP, and SATIS. SOCP-1 ("Lectures were impersonal"), SOCP-6 ("I felt uncomfortable participating in discussions"), and SOCP-9 ("Courses tend to be more impersonal than face-to-face courses") were reverse coded for data analysis.

The site size (SITE) variable was defined as the number of students at each host- and remote-site. Specifically, the number of student registrations at the end of the term, obtained from the USU distance education administration office, was used.

Because the study sample was neither randomly selected nor assigned to the remote- and host-site groups, the interpretation of statistical significance tests would have been problematic (Shaver, 1993). For the first two research questions (Is there any difference in mean SRIC scores between the remote- and host-site groups, and is there any difference in mean social presence scores between the remote- and host-site groups?), effect sizes (Cohen's *d*, see p. 74) were computed on the four SRIC subcategories (INST, TECH, MNGM, and SATIS) and on social presence mean scores (SOCP). The criterion $d \geq .47$ was used to determine the educational significance of *d* (see p. 74).

For the third research question (Is any association between SRIC scores and social presence scores educationally significant?), Pearson product moment correlation coefficients were computed on SRIC scores (INST, TECH, MNGM, and SATIS) and social presence scores (SOCP), separately for the host- and remote-site groups. The squared correlation coefficient, r^2, was the effect size, with educational significance defined as $r^2 \geq .05$ (i.e., 5% or more the variance in common).

The same statistical analyses were conducted to investigate the fourth research question (Is any association between SRIC scores and the number of students at sites educationally significant?) and the fifth research question (Is any association between social presence scores and the number of students at sites educationally significant?).

Results and Discussion

Table 29 contains the means and the standard deviations for the remote- and host-site groups, and the effect sizes for the five sets of scores. The direction of effect sizes

Table 29

Descriptive Statistics for Remote and Host Sites

	Host		Remote		Total		
Variable	Mean	*SD*	Mean	*SD*	Mean	*SD*	*D*
INST	5.79	.74	5.49	1.03	5.52	1.01	.30
TECH	5.65	1.00	5.39	1.03	5.42	1.02	.25
MNGM	5.93	.78	5.44	.93	5.49	0.93	.53
SOCP	4.44	.96	4.54	1.00	4.53	0.99	-.10
SATIS	5.01	1.11	5.25	1.27	5.22	1.25	-.19

Note. Host, $n = 32$; Remote, $n = 286$.

was not consistent: Mean INST, TECH, and MNGM ratings were higher by host-site students, and mean SOCP and SATIS ratings were higher by remote-site students.

The only educationally significant effect size, *d*, was for MNGM ($d = .53$). Even though the results on SOCP and SATIS were not at educationally significant levels, the directions of the result were unexpected. Social presence ratings were expected to be higher for host-site students, because of the definition of the social presence. As defined earlier (see p. 123), social presence is "the degree to which he [(an instructor in the case of educational settings)] is perceived as a 'real person'" (Short et al., 1976, p. 73). When an electronic technology-based delivery is involved in communication, the capacity of the medium to transmit nonverbal cues (such as facial expression) contributes to the degree of social presence. Therefore, the degree of social presence of the instructor could be lowered when students are at a remote site. However, again, the results on SOCP and SATIS were not educationally significant.

To answer the first research question, there was one educationally significant difference, on MNGM, between the remote- and host-site groups; students at host sites rated their instructors' course management higher than did remote-site students. In regard to the second research question, the social presence difference was not educationally significant.

The correlational results for the third research question are shown in Table 30, along with alpha coefficient reliability coefficients for the scores. Correlations were computed on pairwise data; students' scores were excluded from analysis if a score was missing for one or both of a pair of variables being correlated. By using pairwise exclusion, instead of listwise, in which a student with missing data for any variable would have been excluded from all correlations, the maximum available information was used for analysis. However, the coefficients are based on varying sample sizes. The pairwise sample sizes were Max = 32, Min = 28 for the host-site group and Max = 281, Min = 266 for the remote-site group.

Scores on the SRIC subcategories were associated with social presence scores at an educationally significant level for both the host- and remote-site groups (i.e., the third research question). These correlations were especially strong for social presence scores and instruction ($r = .68$, $r^2 = .46$ for the host-site group; $r = .50$, $r^2 = .25$ for the remote-site group), social presence and satisfaction ($r = .62$, $r^2 = .38$ for the host-site group; $r = .63$, $r^2 = .39$ for the remote-site group).

The positive relationships between social presence scores and SRIC categories were similar to the results of Gunawardena and Zittle (1997), except for the magnitude of the relationships ($r^2 = .60$). Gunawardena and Zittle studied social presence scores as a

Table 30

Correlation Matrix for Questionnaire

Site	Variable	SITE	INST	TECH	MNGM	SATIS	SOCP
Host	INST	-.01 (.00)	**.91**				
	TECH	-.04 (.00)	.53 (.28)	**.92**			
	MNGM	-.29 (.08)	.43 (.18)	.46 (.21)	**.97**		
	SATIS	-.09 (.01)	.50 (.25)	.15 (.02)	.13 (.02)	**.67**	
	SOCP	-.02 (.00)	.68 (.46)	.38 (.14)	.47 (.22)	.62 (.38)	**.82**
Remote	INST	-.25 (.06)	**.95**				
	TECH	-.15 (.02)	.50 (.25)	**.89**			
	MNGM	-.13 (.02)	.51 (.26)	.57 (.32)	**.91**		
	SATIS	-.30 (.09)	.61 (.37)	.39 (.15)	.44 (.19)	**.79**	
	SOCP	-.23 (.05)	.50 (.25)	.37 (.14)	.35 (.12)	.63 (.39)	**.87**

Note. Coefficient alpha reliability coefficients appear on the diagonal in bold type. r^2 values are in parentheses.

predictor of satisfaction in on-line conference courses and found them to be an "effective predictor" of overall learner satisfaction. Because their participants were from an on-line conference course, they did not have nonverbal communication. However, this social presence study was not conducted in an on-line course setting. Some level of nonverbal communication through the satellite system is possible: There is one-way visual transmission (i.e., from instructors to students). The difference in the magnitude of the relationships I found and those reported by Gunawardena and Zittle could be due to the difference in the instructional delivery systems.

Correlation coefficients are also listed in Table 30 for SRIC scores and the number of students at the sites (i.e., the fourth research question). For the host-site group, an educationally significant association was found only between SITE and MNGM (r = -.29, r^2 = .08). On the other hand, INST and SATIS had educationally significant associations with SITE for the remote-site group (r = -.25, r^2 = .06 for INST; r = -.30, r^2 = .09 for SATIS).

The directions of the relationships between site size and the SRIC subcategories were consistent with ones from the main study. As shown in Table 24 (p. 116), the relationship between USU SRIC AVG and SITE (site size) was negative (r = -.09), and the results in this social presence study were all negative (Table 30). Especially course management was rated lower by host-site students when the site sizes were larger, and the instruction- and satisfaction-related items were rated lower by remote-site students when site sizes were larger.

For SOCP and SITE (fifth research question), an educationally significant association was found for the remote-site group (r = -.23, r^2 = .05), but for the host-site group (r = -.02, r^2 = .00). Students at the remote sites tended to score the instructor's social presence higher when the site size was smaller.

Social Presence Study Summary

The purposes of this social presence study were to investigate whether mean SRIC and social presence scores were different for remote- and host-site groups, and to investigate the associations between SRIC and social presence scores, site size (i.e., number of students at a site) and SRIC scores, and site size and social presence scores.

The questionnaire included four measures of the SRIC variable (INST, TECH, MNGM, and SATIS) and one of the social presence variable (SOCP).

Remote-site students rated course management lower than host-site students did, and the difference is educationally significant ($d = .53$). Positive and educationally significant relationships were found for social presence scores and scores on the SRIC variables (INST, TECH, MNGM, and SATIS). Students who rated social presence higher also tended to rate instruction/instructor, the technology used, the course management, and satisfaction higher.

Educationally significant relationships were found between site size and the SRIC subcategory of course management for host sites, and the SRIC subcategories of instruction and satisfaction for remote sites. These relationships were all negative; students at smaller host sites tended to rate the course management higher, and students at smaller remote sites tended to rate instruction and satisfaction higher. Also an educationally significant relationship was found, with social presence rated higher when site sizes were smaller. But this relationship was found only for remote-site students.

Social Presence Study to Teacher Immediacy Study

In the social presence study, one finding that was of research interest, although not educationally significant, was the difference in mean social presence scores between the remote- and host-site groups. That result must be interpreted with caution because the number of participants in the host-site group was small ($n = 32$). Students at remote sites tended to score their instructor's social presence higher than did host-site students

($Mean_{Host}$ = 5.01, $Mean_{Remote}$ = 5.25, d = -.19)—the degree of social presence of the instructor was expected to be rated lower by students at remote sites.

A theory that could possibly explain this unexpected result is teacher immediacy, which is related to, but conceptually different from, social presence. In the next chapter (see p. 140), the conceptual difference between social presence and teacher immediacy is explained and research is reported on teacher immediacy as a variable that may differentiate host- and remote-sites in distance education.

CHAPTER VI

TEACHER IMMEDIACY STUDY

Background

The amount of nonverbal communication and proximity between teacher and student were discussed in the literature as important differences between host- and remote-sites in distance education (Biner et al., 1997; Kiesler, Siegel, & McGuire, 1984; Spooner et al., 1999; Walden, 1997). Kiesler et al. stated, "Lack of nonverbal involvement is a critical dimension of electronic [non-face-to-face] communication" (p. 1131), because nonverbal feedback, such as smiling or eye contact, is important to establish closeness to students. This concept of nonverbal feedback was also discussed in terms of teacher immediacy (Andersen, 1979; Christophel, 1990; Gorham, 1988; Hackman & Walker, 1990; Kearney, Plax, Smith, & Sorenson, 1988; Kearney, Plax, & Wendt-Wasco, 1985; Kelly & Gorham, 1988; Thweatt & McCroskey, 1998).

Teacher Immediacy

The concept of teacher immediacy was explored by Andersen (1979) as a predictor of teaching effectiveness. She examined immediacy behaviors in a classroom, and defined teacher immediacy as communicative behaviors that enhance closeness to students in the classroom. Andersen stated, "A systematic and conceptually based system of predicting effective and ineffective teaching can be derived from the nonverbal concept of immediacy" (p. 544). According to Andersen, immediacy behaviors are

"behaviors that *reduce the distance between people*. The distance reduction can be accomplished by decreasing the actual physical proximity or by reducing the psychological distance" (p. 544, italics in the original).

The concept of immediacy (i.e, the foundation of the concept of teacher immediacy) was originally developed by Mehrabian (1969, cited in Andersen, 1979) for understanding speech behaviors. He referred to immediacy as the result of communication behaviors that "enhance closeness to and nonverbal interaction with another" (Mehrabian, 1969, p. 203, cited in Andersen, 1979, p. 544). More broadly, Wiener and Mehrabian (1968) defined immediacy as "the relationship between the speaker and the objects he communicates about, the addressee of his communication, or the communication itself" (p. 3). Mehrabian also stated the concept of immediacy as:

> [P]eople are drawn toward persons and things they like, evaluate highly, and prefer, and they avoid or move away from things they dislike, evaluate negatively, or do not prefer.... [Immediacy and liking] are two sides of the same coin. That is, liking encourages greater immediacy and immediacy produces more liking. (Mehrabian, 1971, p. 77, cited in Andersen, 1979, p. 544).

According to Wiener and Mehrabian (1968), communication behaviors that can promote immediacy include body movements, such as gestures, facial expressions, and postures.

There are two types of teacher immediacy in general: verbal teacher immediacy and nonverbal teacher immediacy. Verbal teacher immediacy includes verbal-linguistic behaviors. Wiener and Mehrabian (1968) developed a procedure for analyzing linguistic immediacy and scoring the immediacy of behaviors based on their criteria. Later, Gorham (1988) suggested that verbal behavior contributes to perceived immediacy along with nonverbal behaviors. Nonverbal teacher immediacy behaviors include, according to Andersen (1979) and Gorham, closer physical distance, communicating on the same

spatial plane (i.e., face-to-face, rather than through communication devices, such as phone or video), relaxed posture, using overall purposeful body movements, eye contact, and facial expression (e.g., smiles).

From Social Presence to Teacher Immediacy

In my social presence study (p. 123), I investigated whether there were any educationally significant relationships between social presence and the noninstructional variables of remote/host sites and site size. The result was unexpected. The students at remote sites scored their instructor's social presence slightly more favorably than did students at host sites. However, the results were not educationally significant (see Table 29, p. 132). There are conceptual differences between teacher immediacy and social presence.

The relation of social presence to teacher immediacy. The conceptual difference between immediacy, as the conceptual basis for teacher immediacy, and social presence was explained by Short et al. (1976), who developed the theory of social presence. Social presence is defined as "the degree to which he [(an instructor in case of educational settings)] is perceived as a 'real person'" (Short et al., p. 73), whereas immediacy is defined as "a measure of the psychological distance which a communicator puts between himself and the object of his communication, his addressee or his communication." (p. 72).

Short et al. (1976) explained this difference using an example:

> Technological immediacy may seem very similar to our own concept of Social Presence, but there are important differences. This is evident from the fact that the immediacy implied by the use of a particular medium of communication may vary even when Social Presence does not. For example, if a person uses his

> telephone to speak to someone in an adjacent office when it would be just as convenient to go and see him, an impression of 'distance' and non-immediacy is likely to be created. . . . However, the non-immediacy associated with the use of the telephone in this instance is less likely to be replicated when the two parties are separated by considerable physical distance. In these cases, where face-to-face communication is not practicable, the use of the telephone does not carry the same connotation. Although immediacy varies in these two kinds of situation, the Social Presence afforded by the telephone will be the same. . . . In some cases, immediacy and Social Presence may vary together. For example, if a person has both a voice telephone and a picture telephone available, both immediacy and Social Presence will be greater if he chooses to use the latter. (p. 73).

The explanation of the difference between the teacher immediacy and social presence theories supported conducting this teacher immediacy study: Immediacy may vary in some situations even though social presence does not.

Studies on Teacher Immediacy

Several studies have been conducted using the concept of teacher immediacy to investigate teaching effectiveness or student satisfaction in higher education. As mentioned earlier, Andersen (1979) investigated teacher immediacy as a predictor of teaching effectiveness, defined as student ratings. She found educationally significant relationships between nonverbal teacher immediacy and teaching effectiveness in college courses. Andersen defined immediacy in her survey as "The more immediate a person is, the more likely he/she is to communicate at a close distance, smile, engage in eye contact, use direct body orientation, use overall body movement and gestures, touch others, relax, and be vocally expressive." (p. 548). She found teacher immediacy accounted for approximately 46% of the variance in the students' affect toward the instructor and 20% of the variance in students' affect toward the course content.

Similarly Kearney et al. (1985) found that teacher immediacy ratings were positively associated ($r = .79$ for psychology and sociology courses; $r = .52$ for other courses) with student ratings of satisfaction and teaching effectiveness for on-campus courses that included psychology, sociology, management, communication, engineering, accounting, computer science, and math.

A study related to teacher immediacy in distance education was reported by Hackman and Walker (1990). They examined the impact of verbal and nonverbal immediacy on reported learning outcomes and student satisfaction in distance education. They investigated how instructional technologies and teacher immediacy were associated with student reports of learning outcomes and with student satisfaction. Their results indicated that system variables such as interactivity and clear audio and video transmission were positively associated with student satisfaction and learning. They also found that immediate behaviors, such as encouraging involvement and offering individual feedback, were perceived more positively.

As general comments on distance education courses, not as a study of teacher immediacy, Barker and Platten (1988) stated that satellite courses should involve intentionally initiated interaction with students, because instructors cannot see their students. Furthermore, they also suggested, "[an instructor's] techniques—such as pausing, clear voice articulation, repetition of important content, and direct eye contact with the camera—need to be purposely incorporated into each lesson" (p. 48).

Some researchers have also studied the relationship between student outcomes and teacher immediacy for on-campus students. Two studies produced inconsistent results. Kelly and Gorham (1988) studied the effects of immediacy on recall of

information. They found that a combination of eye contact and physical immediacy accounted for about 20% of the overall variance in recall scores. On the other hand, Andersen (1979) found that teacher immediacy for on-campus courses did not have an educationally significant relationship to cognitive learning that was measured by scores on an exam.

Although it could be worth investigating, the relationship between student outcomes and teacher immediacy was not my research interest in this teacher immediacy study. Rather, the purpose was to investigate the relationship of teacher immediacy to two noninstructional variables—HOST and SITE.

Teacher Immediacy and Noninstructional Variables

HOST. Based on the results from the studies reported in the literature, teacher immediacy could be associated with student satisfaction and teaching effectiveness for both on-campus courses and distance education courses. However, the relationship of teacher immediacy to host and remote sites is not clear, even though the concept of teacher immediacy itself is closely related to actual physical proximity. As described earlier, Andersen (1979) implied that immediacy behaviors reduce the distance between people by decreasing the actual physical proximity or by reducing the psychological distance. Consequently, it would be expected that host-site students would rate teacher immediacy higher than remote-site students would.

SITE. The relationship of teacher immediacy to site size in distance education is also not clear. Because no study was located that investigated the relationship between site size and teacher immediacy, and site size was negatively (but not at an educationally

significant level) associated with SRIC, that relationship was also studied in this teacher immediacy study.

Interaction at Remote Sites

Walden (1997) conducted qualitative research on the interaction of students and instructors and the interaction among the students at the remote sites of distance education courses at Utah State University. She registered for audited credits in 11 courses at four remote sites for the two quarters and observed students at these remote sites. Walden found that students' interactions with the instructor and with classmates at their sites were important for effective learning and student satisfaction. Thus, the dynamics of site size may have an effect on SRIC. However, no study has been reported of the relationship between interaction at remote sites (e.g., between students or between a student and his/her instructor) and site size in distance education. Understanding the relation of site size to the amount of interaction and to levels of satisfaction with the amount of interaction could help to understand students' satisfaction at remote-sites.

Purposes of Teacher Immediacy Study

The purposes of this teacher immediacy study were to investigate whether there was relationship between teacher immediacy and the distance education-specific noninstructional variables, site size and remote/host-site, and also to investigate whether the amount of reported interaction with the instructor was related to teacher immediacy scores or to the two noninstructional variables. In specific, the research questions were:

1. Is there a difference in teacher immediacy scores between remote- and host-site groups?

2. Is there an association between teacher immediacy scores and site size?

3. Is there an association between amount of interaction with the instructor reported by students and the noninstructional variables of host site/remote site and site size?

4. Is there an association between amount of reported interaction with the instructor and teacher immediacy scores?

Procedures and Methods

Participants

In this teacher immediacy study, the accessible population was distance education students at Utah State University. The study was added after the main study had been conducted in spring semester 2000, raising a data-collection issue. Although a follow-up survey could have been administered to students from the main study after the end of the semester that was not done, for several reasons.

First, because many items in the survey were time sensitive, due to the characteristics of teacher immediacy, it was important that the survey be administered during a course, rather than several weeks after the course ended. The teacher immediacy survey questions asked about detailed instructor behaviors, so immediate recall was crucial.

Student availability was also a problem that would have affected the return rate of a follow-up survey. After the spring semester ended, many students changed locations; therefore, mailed surveys and telephone surveys would have been less productive than

during the academic year. In other words, the response rate would have been lower or unpredictable.

The final concern about using spring-semester students in the summer was posted grades. Students would know their spring grades by the time the teacher immediacy survey was conducted, and that knowledge of grades might influence their survey responses.

To avoid these problems, a survey was conducted with students in courses during summer semester 2000. Only students taking the first 8-week summer-semester courses were included, for the following reasons: First, brief summer workshops and 4-week summer session classes might yield different teacher immediacy results due to limited student-instructor contact. Second, the first 8-week summer session started right after the spring semester ended, so more students who had taken the spring semester classes might be included in courses than those that began later in the summer semester.

The numbers of students from the first 8-week courses in summer semester 2000 at Utah State University who participated the survey are listed in Table 31. In the table, the end of semester registration and survey return rates are also listed.

Instrumentation

Teacher immediacy. A teacher immediacy survey was developed using questions from the study by Gorham (1988). The survey instrument is included in Appendix D. There were two subsets of questions: 17 questions for teacher-immediacy verbal (TIV) behaviors and 13 questions for teacher-immediacy nonverbal (TINV) behaviors (see Table 32).

Table 31

Registration in Distance Education Courses and Survey Numbers, Summer 2000

Course	Course number	End of semester registration	Collected survey	Survey return rate
Physics	1000	36	29	.81
Theatre Arts	1010	49	32	.65
English	1010	23	20	.87
Statistics	1040	17	12	.71
Political Science	1100	14	13	.93
English	2010	28	15	.54
Family and Human Development	2250	12	11	.92
Business Information Systems	2450	40	29	.73
History	3220	12	11	.92
Accounting	3410	59	50	.85
Sociology	3430	23	19	.83
Family and Human Development	3530	35	30	.86
Special Education	4000	51	40	.78
Business Administration	4410	86	62	.72
Accounting	4500	45	31	.69
History	4910	7	5	.71
Instructional Technology	5050	29	9	.31
Special Education	5320	28	21	.75
Human Environment	6240	14	8	.57
Sociology	6310	19	12	.63
Business Information Systems	6350	26	12	.46
Psychology	6460	49	42	.86
Business Information Systems	6550	10	13	1.30[a]
Mathematics	0900	45	39	.87
Psychology	1400/1410	57	50	.88
English	1010B	11	14	1.27[a]
Business Information Systems	3500/6500	77	39	.51
Business Information Systems	5450/6450	54	40	.74
Business Information Systems	5700/6700	52	32	.62
		1,008	740	.73

[a] Total more than 100% could be due to a number of factors: miss-scanning; forms from audit students; students registered for an on-campus course but attending a distance education course.

Table 32

Teacher Immediacy Survey Items

Category	Item #	Description
Verbal		The instructor:
behavior	1	Uses personal examples or talks about experiences she/he has had outside of class
	2	Asks questions or encourages students to talk
	3	Gets into discussions based on something a student brings up even when this doesn't seem to be part of his/her lecture plan
	4	Uses humor in class
	5	Addresses students by name
	6	Addresses me by name
	7	Gets into conversations with individual students before or after class
	8	Has initiated conversations with me before, after, or outside of class
	9	Refers to class as "our" class or "we" are doing
	10	Provides feedback on my individual work through comments on papers, oral discussions, etc.
	11	Calls on students to answer questions even if they have not indicated that they want to talk[a]
	12	Asks how students feel about an assignment, due date, or discussion topic
	13	Invites students to telephone or meet with him/her outside of class if they have questions or want to discuss something
	14	Asks questions that solicit viewpoints or opinions
	15	Praises students' work, action, or comments

(*table continues*)

Category	Item #	Description
(Verbal behavior)	16	Will have discussions about things unrelated to class with individual students or with the class as a whole
	17	Is addressed by his/her first name by the students
Nonverbal behavior	1	Sits behind the desk while teaching[a]
	2	Gestures while talking to class
	3	Uses monotone/dull voice when talking to class[a]
	4	Looks at the class while talking
	5	Smiles at the class as a whole, not just individual students
	6	Has a very tense body position while talking to the class[a]
	7	Touches students in the class
	8	Moves around the classroom while teaching
	9	Looks at the board or notes while talking to the class[a]
	10	Stands behind podium or desk while teaching[a]
	11	Has a very relaxed body position while talking to the class
	12	Smiles at individual students in the class
	13	Uses a variety of vocal expressions while talking to the class

[a] Presumed to be nonimmediate behaviors. Item scoring reflected for analyses.

Students were asked to rate the frequency of behavior on a scale from 0 (Never) to 4 (Very Often). The scoring of some items was reversed to be consistent with the concept of immediacy. For example, the first nonverbal behavior item, "Sits behind desk while teaching," indicates nonimmediate behavior, and the item loadings were reversed in calculating scores. Higher scores indicated better teacher immediacy.

Gorham (1988) reported a split-half reliability coefficient of .94 for the verbal teacher-immediacy behavior questions, and .84 for the nonverbal teacher-immediacy

behavior questions. All of the items were correlated at least .45 with the survey mean scores. Gorham (1988) also conducted a factor analysis on the items. He reported that there was only one interpretable loading, which he called "effective teacher behaviors."

On the second page of the survey, 13 questions were indicated about the amount of student interaction with classmates and the instructor (see Appendix D). Most of these items came from the USU Distance Education Survey (Utah State University Distance Education, 2000a).

Procedures

The first 8-week summer session of distance education began on May 15 and ended on June 30, 2000. When the social presence study of social presence was conducted, it was found that instructors tended to decline to administer surveys if asked to do so at the very end of the semester. In order to increase accessibility to the students, the survey was administered one or two weeks before summer semester ended.

Conducting the survey. Letters to faculty requesting participation were based on previous research findings by Shin (1992b) and Christensen (1996). Shin investigated the response rates of mail questionnaires mailed to university professors. She found that questionnaires sponsored by a university had higher response rates than those sponsored by a private research institute, and that professors tended to participate more in research with a recognized institution and personalized cover letters. Personalized cover letters with personalized salutations (e.g., "Professor Jones") and hand-applied signatures had higher response rates (39.8%) for Shin than cover letters with a duplicated "Dear Colleague" salutation and duplicated signatures (33.5%).

The letter sent to the instructors of the courses listed in Table 31 to get permission to conduct the survey (see Appendix E) was printed on ILS letterhead and mailed in envelopes from the ILS office. The letter was personalized with salutation and cosigned by the associate dean for Information and Learning Resources (ILS) at Utah State University and me.

Within a week after the mailing, the instructors were contacted by telephone, e-mail, or in person to set up an appointment to administer the survey. Telephone calls were used when the instructors were at remote-sites. Out of 30 contacted instructors, 29 agreed to cooperate with the study. One instructor declined because the course was behind schedule.

In order to increase the survey response rate, a monetary incentive was also used. The survey cover letter (see Appendix D) stated:

> This survey was created by a graduate student in the Department of Psychology. Please take a few minutes to answer the items. Your help with this research is much appreciated. In appreciation, you will have a chance to win $25. When you complete this survey and return it to your site coordinator, you will automatically have a chance to win a $25 cashier's check! 10 winners will be selected from the completed surveys! This sheet will be separated from the survey after completion of the all items is verified. Data will then be processed and your answers will be totally confidential.

The survey instruments were distributed to each site through the USU Distance Education Office. Once students filled out the surveys, they were collected by site coordinators and sent back to the Distance Education Office by the site coordinators. Although site coordinators informed me unofficially that all students in their classrooms took the survey, the return rate for the accessible students (i.e., those there to take the survey) is unknown because I could not observe at the remote sites. However, all of the

accessible host-site students returned the survey. Based on the social presence study, the expected return rate for this survey was 60% of registered students who were taking the courses in which the surveys were conducted. The return rate for all distance-education students who were registered that session was 73.4% (740 out of 1,008 registered students).

A week after the off-campus courses were over, a letter was sent to each instructor to thank them for their cooperation (Appendix F), and from those students who completed surveys, 10 were randomly selected and a $25 certificate was mailed to each.

Analyses

First, reliability coefficients, alpha, were calculated for TIV (Teacher Immediacy-Verbal) and TINV (Teacher Immediacy-Nonverbal) scores. These coefficients were important for understanding the reliability of immediacy scores, and as an indication of whether low reliability attenuated any relationships between the teacher immediacy and USU SRIC scores. Along with the reliability coefficients on TIV and TINV, "item-total correlations" and "Alpha if item deleted" analyses were also conducted. The item-total correlations were univariate correlation coefficients between each item and the total score, and the "Alpha if item deleted" listed what the reliability coefficient would be if the item were deleted from the list of items.

All questions about associations were addressed with Pearson product moment correlations. The educational significance level, as in the main study, was set at $r^2 = .05$. Means and *SD*s were computed and questions about differences were addressed with Cohen's *d*. The educational significance level was, as in the main study, set at $d = .46$.

Results and Discussion

Survey Reliability Coefficients

The reliability coefficients were .87 for TIV scores ($N = 612$) and .73 for TINV scores ($N = 528$). Gorham (1988) did not report alpha reliability coefficients; however, according to Hatcher and Stepanski (1994) and de Vaus (1986), a reliability coefficient of at least .70 is in good range of acceptable reliability coefficients. Because the reliability coefficients I obtained were over .70, they are in the acceptable range.

The "item-total correlation" and "Alpha if item deleted" analyses results are presented in Table 33. Item TIV 11, "Calls on students to answer questions even if they have not indicated that they want to talk" was negatively correlated with the total TIV scores ($r = -.38$). And alpha coefficients increased when the item was deleted. Apparently, the judgment that the item should be reverse scored to be valid as a verbal-related teacher immediacy item was not correct.

As mentioned before, TINV 1 and TINV 10 had very small item-total *r*s (.08 and .04, respectively). TINV 1 is, "Sits behind the desk while teaching," and TINV 10 is, "Stands behind podium or desk while teaching." They are probably less important as teacher immediacy survey items for distance education courses, because of the technological restrictions on teacher movement (see later discussions).

Also, TINV 7, "Touches students in the class" was weakly related to the total scores of TINV ($r = .13$). This may not be an appropriate item for the nonverbal teacher immediacy scale nowadays. Prior to conducting the survey, questions were raised about whether the item should be on the scale, because whether any physical contact with

Table 33

Item-Total Statistics for Survey Verbal Items (TIV) and Nonverbal Items (TINV) for Total Accessible Population

Verbal items (TIV)			Nonverbal items (TINV)		
Item	Item-total correlation	Alpha if deleted	Item	Item-total correlation	Alpha if deleted
TIV 1	.47	.86	TINV 1	.08	.76
TIV 2	.60	.86	TINV 2	.44	.70
TIV 3	.45	.86	TINV 3	.59	.68
TIV 4	.66	.85	TINV 4	.45	.70
TIV 5	.60	.85	TINV 5	.59	.68
TIV 6	.61	.85	TINV 6	.47	.70
TIV 7	.64	.85	TINV 7	.13	.73
TIV 8	.60	.85	TINV 8	.27	.72
TIV 9	.58	.86	TINV 9	.18	.73
TIV 10	.59	.85	TINV 10	.04	.76
TIV 11	-.38	.90	TINV 11	.51	.69
TIV 12	.59	.86	TINV 12	.44	.70
TIV 13	.53	.86	TINV 13	.61	.68
TIV 14	.60	.85			
TIV 15	.70	.85			
TIV 16	.46	.86			
TIV 17	.32	.87			

students is appropriate behavior has become a sensitive issue. While taking the survey, students often questioned the researcher as to what the question really meant.

The correlations between TIV and TINV total score were .51 for the host-site group, and .65 for remote-site group.

Differences in Teacher Immediacy Scores at Host and Remote Sites (Research Question 1)

The survey mean scores, the standard deviations, and effect sizes, *d*, with the number of participants, are listed in Tables 34 and 35. Table 34 is for the host-, remote-sites, and total groups in distance education courses for TIV items, and Table 35, for TINV items.

As shown in Table 34, 701 TIV responses were available (136 from host sites, and 565 from remote sites), whereas TINV responses were from 624 participants (129 from host sites, and 495 from remote sites) in Table 35. The discrepancy in total numbers of TIV and TINV responses ($n = 77$) was mainly because the second page of the survey material was missing for some students ($n = 64$). Due to undelivered or missing survey materials, some site coordinators photocopied survey materials. Even though the site coordinators were reminded that the survey material was two-sided, the second page of the survey material was not photocopied to be distributed to 64 students at remote sites.

For all but two items (TIV 11, TINV 10), the host-site students scored teacher immediacy higher than the remote-site students did. This pattern is evident in Figure 5, which displays a graph of TIV and TINV item means for the two groups. In addition,

Table 34

Survey Verbal Items (TIV) Descriptive Statistics for Host and Remote Sites

	Host site			Remote site			Total			
Item	*n*	Mean	*SD*	*n*	Mean	*SD*	*N*	Mean	*SD*	*d*
TIV 1	136	4.06	.86	587	3.41	1.09	723	3.54	1.08	.60
TIV 2	136	4.32	.72	587	3.98	1.00	723	4.05	.96	.35
TIV 3	135	3.57	1.09	588	3.16	1.15	723	3.24	1.15	.36
TIV 4	136	3.86	.81	589	3.23	1.14	725	3.35	1.11	.57
TIV 5	135	3.88	1.22	583	3.45	1.36	718	3.53	1.34	.32
TIV 6	135	3.73	1.51	577	2.88	1.56	712	3.04	1.58	.54
TIV 7	135	3.97	.97	518	2.75	1.21	653	3.00	1.26	.97
TIV 8	136	3.21	1.37	549	1.74	1.15	685	2.03	1.33	1.11
TIV 9	135	4.24	.80	584	3.72	1.15	719	3.82	1.11	.47
TIV 10	134	3.84	1.21	576	3.18	1.45	710	3.30	1.43	.46
TIV 11	136	3.02	1.36	580	3.40	1.39	716	3.33	1.39	-.27
TIV 12	134	3.54	.99	585	2.99	1.26	719	3.09	1.23	.45
TIV 13	136	3.94	1.09	584	3.48	1.30	720	3.57	1.27	.36
TIV 14	134	3.85	.92	585	3.45	1.26	719	3.52	1.21	.33
TIV 15	135	4.04	.93	583	3.50	1.22	718	3.60	1.19	.45
TIV 16	135	2.84	1.11	574	2.17	1.08	709	2.30	1.11	.60
TIV 17	136	4.07	1.09	581	3.39	1.50	717	3.52	1.46	.47
Total	136	3.76	.56	565	3.17	.70	701	3.28	.71	.83

Table 35

Survey Nonverbal Items (TINV) Descriptive Statistics for Host and Remote Sites

	Host site			Remote site			Total			
Item	*n*	Mean	*SD*	*n*	Mean	*SD*	*N*	Mean	*SD*	*d*
TINV 1	132	3.23	1.55	521	2.67	1.59	653	2.78	1.60	.35
TINV 2	134	3.97	.80	518	3.38	1.17	652	3.50	1.13	.52
TINV 3	134	4.25	.83	524	3.73	1.25	658	3.83	1.19	.44
TINV 4	134	4.49	.70	513	4.21	.98	647	4.27	.93	.30
TINV 5	132	4.23	.90	509	3.79	1.17	641	3.88	1.14	.39
TINV 6	134	4.28	.75	515	4.07	1.03	649	4.12	.98	.21
TINV 7	126	1.39	.68	469	1.17	.58	595	1.22	.61	.36
TINV 8	126	2.42	1.13	495	1.85	1.04	621	1.97	1.08	.53
TINV 9	130	3.48	.93	503	3.32	1.16	633	3.35	1.12	.14
TINV 10	128	2.52	1.20	505	2.52	1.43	633	2.52	1.39	.00
TINV 11	132	4.02	.85	521	3.91	1.07	653	3.93	1.03	.11
TINV 12	132	3.67	1.10	485	2.99	1.32	617	3.14	1.31	.52
TINV 13	134	4.02	.91	523	3.53	1.25	657	3.63	1.21	.40
Total	129	3.54	.46	495	3.18	.57	624	3.25	.57	.63

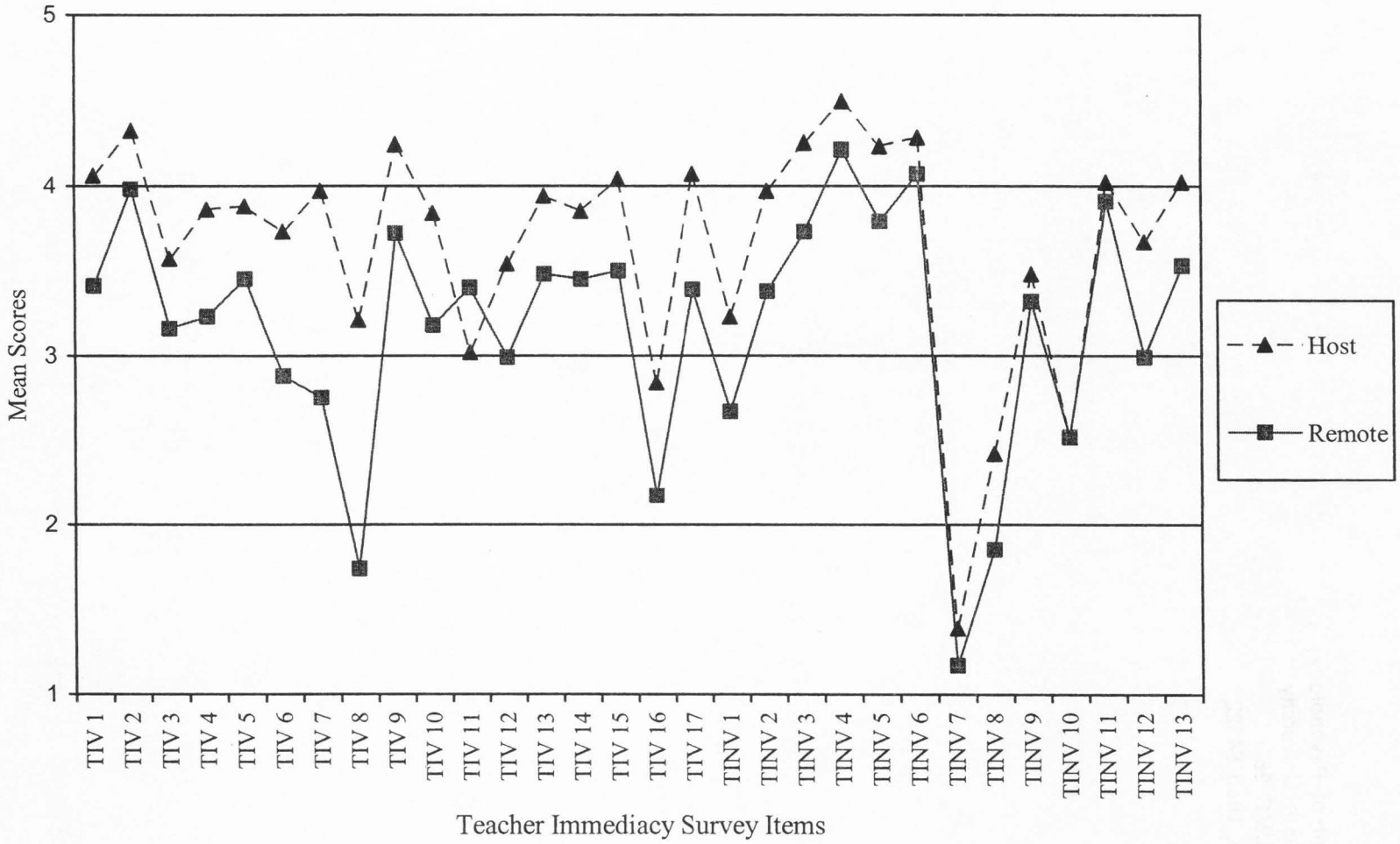

Figure 5. Means of TIV and TINV items for host- and remote-site groups.

most remote-site standard deviations were larger than for the host-site group, indicating greater variability in perceptions of teacher immediacy.

The remote-site students had lower mean scores than the host-site students on all of the TIV items, except TIV 11. For eight items, the mean differences were educationally significant. The educationally significant mean differences were found on TIV 1 (d = .60), TIV 4 (d = .57), TIV 6 (d = .54), TIV 7 (d = .97), TIV 8 (d = 1.11), TIV 9 (d = .47), TIV 16 (d = .60), and TIV 17 (d = .47). The TIV item 7, "Gets into conversations with individual students before or after class" and the TIV item 8 "Has initiated conversations with me before, after, or outside of class" were the most challenging situations for distance education instructors. Very often instructors were disconnected from the delivery systems because the next course session needed to be set up or the system was shut down automatically prior to/after their classes. If instructors did not make extra efforts to get into conversations with students outside of their classes (e.g., by visiting remote-sites), it was not be easy for students to have opportunities for conversation.

For the TINV items, three items had educationally significant mean differences between the host- and remote-site groups. TINV 2, TINV 8, and TINV 12 had d = .52, .53, and .52, respectively, and all of these three items had lower means for the remote-site than the host-site group.

TINV item 8, "Moves around the classroom while teaching" had a mean score of 2.42 for the host site group, and 1.85 for the remote site group. The low mean scores for both groups are likely due to the restrictions of distance education course settings. For satellite courses, there is some physical room to move around the instructor's desk, but

not around the classroom, because of the recording area capacity (i.e., camera recording is limited to desk proximity). In addition, there was no possibility for the instructor not to sit behind the desk while teaching EDNET courses: the camera was only adjusted for the instructor's sitting position; if instructors stood up, they would be out of the camera recording zone.

All other TINV items had noneducationally significant effect sizes, with host-site students' scores higher than remote-site students', except on TINV 10. That item is, "Stands behind podium or desk while teaching," and the effect size was zero. TINV 10 was also an item that had a very small correlation with total item score ($r = .04$). With the physical restriction that the camera was only adjusted for the instructor's standing position behind desk, it is not an appropriate item for assessing the level of teacher immediacy in distance education courses.

Zero-order correlation coefficients (point biserial r, r_{pb}) were calculated between TIV and TINV total scores and the noninstructional variable of HOST. The coefficients were .33 for TIV and .26 for TINV. Both TIV and TINV were scored higher by the students at the host sites. The relationships between the total TIV and TINV scores and HOST were educationally significant ($r^2_{pb} = .11$ for TIV; $r^2_{pb} = .07$ for TINV). The r^2_{pb} values are consistent with the ds for Total TIV and TINV scores, which were also educationally significant ($d_{TIV} = .83$, $d_{TINV} = .63$).

Teacher Immediacy Scores and Site Size
(Research Question 2)

Zero-order correlation coefficients were calculated for the TIV and TINV scores and the noninstructional variable of SITE SIZE, for host- and remote-sites separately.

For remote sites, neither TIV or TINV total score correlations with SITE were educationally significant (r = -.17, r^2 = .03 for TIV; r = -.13, r^2 = .02 for TINV). For host sites, the TIV total score correlation with SITE was not educationally significant (r = -.20, r^2 = .04); however, the TINV total score correlation with SITE was educationally significant (r = .31, r^2 = .10). When more students were present at the host-site, students tended to score nonverbal teacher immediacy higher. With more students present, nonverbal teacher immediacy behaviors were observed more by host-site students or instructors were "better" at immediacy.

On the survey item, "How do you feel about the site size?", "about right" was selected by 63.9% of students (74.3% at host sites; 61.5% at remote sites); 19.2% (21.3% at host sites; 9.6% at remote sites) selected "more students"; and 7.1% (5.4% at host sites; 14.7% at remote sites) selected "fewer students."

Table 36 contains the teacher immediacy means, *SD*s, and *d*s for the students in the three response groups. As the table shows, *d*s among the groups were varied. Students who answered "About Right" and "More Students" on the survey item had no educationally significant TIV and TINV mean differences in neither the host- or remote-site group. However, educationally significant differences were found on TIV and TINV scores in the comparisons between the "Fewer Students" group and the other groups. Host-site students, who felt fewer students would be better, scored educationally significantly higher on TINV than other host-site students (d_{Pair2} = -.57, d_{Pair3} = -.80). Remote-site students, who felt fewer students were better, scored lower on TINV than students who felt more students were better (d_{Pair2} = .60), and also scored lower on TIV

Table 36

Descriptive Statistics for Teacher Immediacy Scores by Responses on the Site-Size Survey Item

	Total	About right[1]			More students[2]			Fewer students[3]			*D*		
SITE	scores	*N*	Mean	*SD*	*N*	Mean	*SD*	*N*	Mean	*SD*	Pair 1	Pair 2	Pair 3
Host	TIV	101	3.71	.58	13	3.92	.47	20	3.92	.50	-.38	.00	-.38
	TINV	97	3.47	.47	12	3.58	.37	20	3.84	.33	-.24	-.57	-.80
Remote	TIV	350	3.13	.69	119	3.31	.63	32	2.78	.82	-.26	.76	.50
	TINV	342	3.14	.58	118	3.32	.50	28	2.98	.69	-.32	.60	.28

Note. The *d*s were computed using the total host- and remote-group TIV and TINV *SD*s from Tables 34 and 35.
1= "the site size is about right"; 2 = "It would be better if there were more students at my site in this class"; 3 = "It would be better if there were fewer students at my site in this class"
Pair 1 = About Right and More Students; Pair 2 = More Students and Fewer Students; Pair 3 = About Right and Fewer Students.

than other remote-site students at an educationally significant level (d_{Pair2} = .76, d_{Pair3} = .50).

The Relation of Reported Interaction to Host/Remote and Site Size (Research Question 3)

Pearson correlation coefficients were calculated for the amount of interaction with the instructor reported by the students (INTERACTION) and the noninstructional variables (HOST/REMOTE and SITE). Three items, listed in Table 37, were scored on a 5-point-scale: "never (0 time)" = 1, "rarely (1-3 times)" = 2, "occasionally (4-6 times)" = 3, "often (7-9 times)" = 4, and "very often (+ 10 times)" = 5 (see Appendix E). Item

abbreviations, means, *SD*s, *d*s, and correlation coefficients are presented in Tables 37 and 38.

Reported amount of interaction and host/remote. As shown in Table 37, there was an educationally significant relationship between HOST/REMOTE and INT 4A ("During this course, how many times in this term did you interact with your instructor?"; $\underline{r}_{pb} = .22$; $\underline{r}^2_{pb} = .05$; $d = .54$). The mean response for the host-site students was higher than that for the remote-site students, at an educationally significant level.

Even though there were not educationally significant relationships between the other two interaction items on the survey and HOST/REMOTE, the effect sizes approached educational significance: $d = .34$ for "How many times in this term did you

Table 37

Interaction Survey Item Descriptive Statistics and Correlation Coefficients for HOST/REMOTE Groups

	HOST/ REMOTE		Host		Remote		
Item	$\underline{r}_{pb}$	$\underline{r}^2_{pb}$	Mean	*SD*	Mean	*SD*	*D*
INT4A. Amount of reported interactions	.22	.05	3.59	1.11	2.92	1.24	.54
INT6A. Amount of reported question asking	.14	.02	3.19	1.13	2.77	1.23	.34
INT7A. Wanted to ask but not able to	-.13	.02	1.44	.72	1.75	1.00	-.32

Note. The *d*s were computed using the total *SD*s from Table 38. $n_{Host} = 134$; $n_{Remote} = 531$.

Table 38

Zero-Order Correlation Coefficients for Interaction Survey Items With SITE (Site Size)

	Total		Host		Remote	
Item	Mean	*SD*	*r*	r^2	*r*	r^2
INT4A. Amount of reported interactions	3.05	1.24	-.33	.11	-.25	.06
INT6A. Amount of reported question asking	2.85	1.22	-.27	.07	-.23	.05
INT7A. Wanted to ask but not able to	1.68	.96	-.03	.00	-.12	.01

Note. $N = 665$.

ask questions of your instructor?" (INT 6A); and $d = -.32$ for "How many times in this term did you want to ask a question, but were not able to do so of your instructor?" (INT 7A). Remote-site students reported asking fewer questions of their instructors. They also reported feeling more often that they were not able to ask questions of their instructors when they wanted.

Reported amount of interaction and site size. As can be seen in Table 38, there were educationally significant relationships between site size and reported interaction scores at both the host- and remote-sites. Host-site students at smaller sites tended to report more interactions with their instructors ($r = -.33$, $r^2 = .11$ on INT4A), and more questions asked of their instructors ($r = -.27$, $r^2 = .07$ on INT6A). Remote-site students at smaller sites also tended to report more interactions with their instructors ($r = -.25$, $r^2 = .06$ on INT4A), and more questions asked of their instructors ($r = -.23$, $r^2 = .05$ on INT6A).

Reported Interaction and Teacher Immediacy Scores (Research Question 4)

As shown in Table 39, there was an educationally significant relationship between INT 4A and TIV for both host- and remote-sites (r = .60, r^2 = .36 for HOST; r = 47, r^2 = .22 for REMOTE), and also between INT 4A and TINV for both host- and remote-sites (r = .26, r^2 = .07 for HOST; r = .35, r^2 = .13 for REMOTE). There were also eduationally significant relationships between INT 6A and TIV for both the host- and remote-sites (r = .52, r^2 = .27 for HOST; r = .39, r^2 = .15 for REMOTE), and between INT 6A and TINV for both the host- and remote-sizes (r = .26, r^2 = .07 for HOST; r = .28, r^2 = .08 for REMOTE). These educationally significant relationships between the amount of reported interactin and question asking for instructors (INT 4A and INT 6A) and teacher immediacy scores (TIV and TINV) indicated that students who reported they did interact or asked their questions of their instructors tended to score

Table 39

Zero-Order Correlation Coefficients for Interaction Survey Items With TIV and TINV Scores

Item	Abb.	Host				Remote			
		TIV		TINV		TIV		TINV	
		R	r^2	*r*	r^2	*r*	r^2	*r*	r^2
Amounts of interactions	INT4A	.60	.36	.26	.07	.47	.22	.35	.13
Amounts of asking questions	INT6A	.52	.27	.26	.07	.39	.15	.28	.08
Wanted to ask but not able to	INT7A	-.26	.07	-.17	.03	-.21	.04	-.16	.03

higher on verbal and nonverbal teacher immediacy. The tendency is slightly stronger for host sites than for remote sites on verbal teacher immediacy.

Also interestingly, *r*s for INT4A and INST6A were higher for TIV than TINV for both host- and remote-site students (r_{TIV} = .60 and r_{TINV} = .26 for Host on INT4A; r_{TIV} = .47 and r_{TINV} = .35 for Remote on INT4A; r_{TIV} = .52 and r_{TINV} = .26 for Host on INT6A; r_{TIV} = .39 and r_{TINV} = .28 for Remote on INT6A). This could be expected as these are verbal immediacy items, and present evidence for the construct validity of the test scores.

INST7A had an educationally significant relationship on TIV for host sites (r = -.26, r^2 = .07), and the relationship on TIV for remote sites approaches educationally significant (r = -.21, r^2 = .04). This result could be also expected—the more questions student can ask, the higher the verbal immediacy.

In sum, these educationally significant relationships between amounts of reported interaction and question asking with instructors and teacher immediacy scores (TIV and TINV) and the higher correlations for TIV could be expected. Teacher immediacy is increased when students ask questions or interact with their instructors, reducing the psychological distance. The effect would be expected to be greater for verbal immediacy as neither interaction or question asking has a direct affect on nonverbal immediacy indicators.

Summary

The purposes of this teacher immediacy study were to investigate whether there were relationships between teacher immediacy and the distance education-specific

noninstructional variables, site size and remote/host-site, and also to investigate whether there were relationships between the amount of reported interaction with the instructor, the noninstructional variables, and teacher immediacy scores.

Prior to the correlation coefficient analyses for these research questions, reliability coefficients were calculated for teacher immediacy verbal items (TIV) and nonverbal items (TINV). The reliability coefficients were adequate. However, TIV 11, "Calls on students to answer questions even if they have not indicate that they want to talk," was negatively correlated with the total score. It should not be reverse scored in further teacher immediacy testing; apparently, it does increase immediacy to be called on (recognized) by the teacher. Also TINV 7, "Touches students in the class" was questioned as a teacher immediacy survey item. Physical contact with students is currently a sensitive issue. Deleting this item from the teacher immediacy survey would be appropriate.

Four research questions were investigated in this teacher immediacy study. The first research question was, "Is there a difference in teacher immediacy scores between remote- and host-site groups?" Educationally significant differences in teacher immediacy scores (TIV and TINV scores) were found between these two groups: host-site students scored immediacy higher than remote-site students did.

As Andersen (1979) suggested, teacher immediacy behaviors reduce the distance between students and teachers by decreasing the actual physical proximity and psychological distance. Short et al. (1976) referred to physical proximity as technological immediacy, which they explained as, "the use of face-to-face communication implies greater immediacy than the use of the telephone or even

interactive television [i.e., satellite system])" (p. 73). As opposed to technological immediacy, Short et al. identified social immediacy, which is "conveyed through speech and associated non-verbal cues" (p. 73). Andersen (1979) implied that these immediacy behaviors reduce distance between teacher and students by reducing the psychological distance.

The educationally significant difference between host and remote site groups in teacher immediacy scores could be explained in terms of technological immediacy, because of the lack of physical proximity between remote-site students and their instructor. Because remote-site students are physically away from their instructors in distance education courses, there will be always lower technological immediacy. Therefore, in order to increase teacher immediacy, distance education instructors may want to pay more attention to social immediacy to offset the lower technological immediacy.

The second research question was "Is there an association between teacher immediacy scores and site size?" An educationally significant relationship was found between TINV total scores and site size at host-sites: When the number of students at the site was larger, students tended to score nonverbal teacher immediacy higher. However, remote-site students tended to score both TIV and TINV lower when site size was larger. These tendencies were not at an educationally significant level.

The third research question was "Is there an association between amount of interaction with the instructor reported by students and the noninstructional variables of host site/remote site and site size?" Host-site students reported more interactions with their instructors than remote-site students did, and the difference was at an educational

significant level. Also, both host- and remote-site students at smaller sites reported more interactions with their instructors and the associations were educationally significant.

In answer to the fourth research question, "Is there an association between amount of reported interaction with the instructor and teacher immediacy scores?", educationally significant relationships were found between the amount of reported interaction with instructors and teacher immediacy scores. Students who reported they interacted with or asked questions of their instructors tended to score higher on verbal and nonverbal teacher immediacy. And correlations were higher for TIV, as would be expected.

In sum, host-site students tended to score teacher immediacy (TIV and TINV) higher and report more interaction with the instructor than remote-site students. At both host and remote sites, students tended to score teacher immediacy higher when they reported more interaction with the instructors, and when they are at smaller sites.

CHAPTER VII

SUMMARY AND DISCUSSION

Summary

Main Study

Purpose and procedures. The purposes of the main study reported in this dissertation were to determine if there were differences in SRIC for on-campus and off-campus courses and to examine the relationship of SRIC, obtained with the "Teacher/Course Evaluation" form at USU, with noninstructional variables for on-campus, off-campus face-to-face, and distance education courses. Ten potential noninstructional variables were identified for on-campus and off-campus face-to-face courses in the Review of Literature chapter: class size (SIZE), course level (LEVEL), course content area (college, COL), current (cumulative) grade point average (GPA), expected grade (GRADE), student prior interest (PRIOR), student year (YEAR), and whether the course is for a major (MAJOR), general education (GENERAL), or an elective (ELECTIVE). For distance education courses, host site or remote site (HOST), EDNET or satellite course (SAT), and site size (SITE) were three additional noninstructional variables. A total of 14,205 USU SRIC forms was collected from students in the three instructional delivery groups (10,724 from on-campus, 1,689 from off-campus face-to-face, and 1,792 from distance education courses) in Spring 2000.

Findings. Prior to the main analysis, factor analyses of the 20-item USU SRIC form were conducted. Two highly correlated factors were identified for each of three

instructional groups. However, the SRIC scores for the groups had different factorial structures. The factors were named "Course" and "Instruction" for on-campus courses, "Course/Instruction" and "Interaction Opportunities/Instructor Availability" for off-campus face-to-face courses, and "Course/Instruction" and "Interaction Opportunities/Helpfulness" for distance education courses. Because of inconsistencies in factor patterns across the on-campus, off-campus face-to-face, and distance education courses, and the high interfactor correlations, it was decided to use the mean score for the 20 items as the dependent variable, rather than having two factor-based dependent variables for further analyses.

Cohen's *d*s were computed for the comparisons of mean SRIC scores for on-campus courses with those for off-campus courses, as well as for off-campus face-to-face and distance education courses. None was educationally significant.

Zero-order correlation coefficients were calculated for the noninstructional variables and the USU SRIC mean scores for the on-campus, off-campus face-to-face, and distance education courses. For all three groups, expected grade was the only variable with an educationally significant relationship to the SRIC mean scores: Expected grade accounted for approximately 7%, 8%, and 6% of the variance in SRIC mean scores for the three groups, respectively.

Separate multiple regression analyses were conducted for the on-campus, off-campus face-to-face, and distance education courses with noninstructional variables as independent variables and SRIC mean scores as the dependent variable. There were educationally significant relationships between the linear combinations of

noninstructional variables and SRIC mean scores for all of the three instructional delivery groups.

The magnitude of variance in SRIC scores accounted for by the noninstructional variables was different among the three instructional delivery groups: The 10 noninstructional variables accounted for approximately 9% of the variance in SRIC mean scores for on-campus education courses, and 11% of the variance for off-campus face-to-face courses. For distance education courses, the 13 noninstructional variables accounted for approximately 15% of the variance in SRIC mean scores. The difference in magnitude of explained variance (R^2) between on-campus and distance education courses (.06) was educationally significant. The beta (β) and unique index (U) results showed that the additional variance explained for distance education courses was likely due to the additional noninstructional variables of site size and host/remote. However, of those noninstructional variables in the multiple regression analyses, only expected grade had an educationally significant unique index for all of the three groups; 5 or 6 % of the total variance in SRIC mean scores was uniquely explained by the noninstructional variable of expected grade. This result was consistent with the results of the zero-order correlation analyses.

Social Presence Study

Purposes and procedures. As a precursor to the main study, a social presence study was conducted to investigate whether mean SRIC and social presence scores were different for remote- and host-site groups, and to investigate the associations between

SRIC, social presence scores, and site size (i.e., number of students at a site) and between site size and social presence scores.

The social presence study questionnaire had 51 items developed by adapting three survey forms. It included four measures of the SRIC variable (instruction/instructor characteristics, technological characteristics, course management and coordination, and satisfaction). The participants were 318 students in eight distance education courses at USU in summer and fall 1999. The return rate for all distance-education students who were registered in the eight courses that session was 69.0%.

Findings. In the social presence study, remote-site students rated course management lower than host-site students did, and the mean difference was educationally significant ($d = .53$). In the zero-order correlation analyses, students who rated social presence higher also tended to rate instruction/instructor, the technology used, course management, and satisfaction higher. Some negative relationships were found between site size and the SRIC subcategories: Students at smaller host sites tended to rate the course management higher, and students at smaller remote sites tended to rate instruction and satisfaction higher. Also, social presence was rated higher when the number of students was smaller at remote sites.

Teacher Immediacy Study

Purposes and procedures. After conducting the main study of on- and off-campus SRIC comparisons and correlations of noninstructional variables and SRIC, a teacher immediacy study was conducted. The purposes of this teacher immediacy study were to investigate the relationships between teacher immediacy and the distance

education-specific noninstructional variables, site size and remote/host-site, and to investigate the relationships between the amount of reported interaction with instructor, the noninstructional variables, and teacher immediacy scores.

A teacher immediacy survey was developed using questions from a study by Gorham (1988). There were two subsets of questions: 17 questions for teacher-immediacy verbal (TIV) behaviors and 13 questions for teacher-immediacy nonverbal (TINV) behaviors. Also three questions were added asking about the amount of student interaction with the instructor. Most of these items came from the USU Distance Education Survey.

Distance-education students from the first 8-week courses in summer semester 2000 at Utah State University participated in the survey. The return rate for all distance-education students who were registered that session was 73.4% (740 out of 1,008 registered students).

Findings. In the teacher immediacy study, the difference between mean teacher immediacy scores from host and remote sites was educationally significant (d = .83 for verbal teacher immediacy; d = .63 for nonverbal teacher immediacy, host-site mean higher), and the association of site size with nonverbal teacher immediacy scores was educationally significant at host sites.

Educationally significant relationships were also found between students' reports of the amount of their interaction with an instructor and the noninstructional variables of host/remote and site size: Host-site students reported more interaction with their instructors than remote-site students did, and both host- and remote-site students at smaller sites reported more interactions with their instructors than did those at larger

sites. Also, students who reported they interacted with or asked questions of their instructors tended to rate both verbal and nonverbal teacher immediacy higher.

Discussion

A large amount of research has been conducted to determine whether student satisfaction and teaching effectiveness are the same for on-campus courses and distance education courses. However, there is a lack of conclusive evidence—including the lack of educationally significant differences in this study— as to any practical differences between the two instructional delivery modes. An assessment of student satisfaction used as a proxy for teaching effectiveness is student ratings of instruction and courses (SRIC). For on-campus courses, many studies have been reported on the SRIC factorial structure and the relationship between noninstructional variables and SRIC. However, not many studies have been reported for distance education courses. In order to investigate SRIC factorial structure difference in on-campus and off-campus SRIC, and the relationship between noninstructional variables and SRIC for distance education courses, results from both delivery modes (i.e., on-campus, distance education, and off-campus face-to-face courses) were of interest.

Utah State University has used the same SRIC form since 1995 for both on-campus and off-campus courses. The only research reported on the USU SRIC form is Chamberlain's (1999) study of SRIC in English on-line courses and Petersen's unpublished study of the relationships between USU SRIC and noninstructional variables. As a first step in an investigation of off-campus SRIC, the correspondence was

explored between the organization of the USU SRIC form and the factorial structure of USU SRIC.

Factor Analysis of USU SRIC

The USU SRIC form has two categories of items—Course and Instruction— and the factor analysis results from this study were consistent with the groupings for on-campus courses. However, the factor-loading patterns for off-campus face-to-face and distance education courses were not consistent with the two groupings of items. Instead, the factor analyses for off-campus students yielded a combined factor (i.e., "Course and Instruction") and new factors: "Interaction Opportunities/ Instructor Availability" for off-campus face-to-face and "Interaction Opportunities/ Helpfulness" for distance education courses.

The mismatch between the USU SRIC form and the factorial structure for off-campus courses raises questions about the use of the same forms for on-campus and off-campus courses at USU. Is the USU SRIC form as valid (i.e., does it assess students' satisfaction and perceptions of teaching effectiveness?) for off-campus courses as for on-campus courses? More research, beginning with verification of the differing factorial structures, is needed to answer that question. Then, if validity is found to be lacking, more research is needed to improve the validity of off-campus SRIC.

Modifying the USU SRIC Form

A possible modification to the USU SRIC form would be to address a potentially neglected SRIC area for off-campus courses, especially for distance education courses—that is, the need for course management items. In the social presence study, students at

remote sites tended to rate course management, which is not encompassed on the USU SRIC forms, lower than students at host sites did. This finding was consistent with feedback obtained while conducting the main study. Some students indicated lower satisfaction with their distance education course because of no or late responses from instructors on assignments or exams. Other students claimed that their reports or assignments had been lost in the mail. Sometimes, students did not receive the course materials on time, even though instructors claimed that they prepared course materials and sent them out to their students at least a week or two prior to their class. The development of course management items for the USU SRIC form should be explored to determine whether they would provide helpful distance-education-specific information on students' satisfaction with instruction.

Also, in this study, it was difficult to obtain SRIC from on-line students. Originally, for the main study, USU SRIC forms from on-line courses were to be included in analyses for various electronic technology-based delivery systems—satellite, EDNET (microwave delivery), and on-line (web-based internet) delivery—along with face-to-face course delivery. However, the number of USU SRIC forms available for on-line courses was too small for analysis. This lack of data raised two questions. First, how should SRIC forms be administered for on-line courses? The on-line students' lack of physical presence in a classroom where USU SRIC forms can be administered presents challenges in data collection than need to be addressed. Second, is the on-campus form appropriate for the different on-line instructional environments? On-line courses are, for example, not held at a specific time and have much less or no in-person interaction with

the instructor. The suitability of the USU SRIC form for the on-line course merits further study.

One potential development is the creation of an on-line rating system. In fact, the Office of Educational Assessment at the University of Washington recently reported the development of an on-line version of its SRIC form, called the IAS Online (Instructional Assessment System Online; University of Washington, 2003). The IAS Online SRIC items are comparable to the University of Washington's paper-based system. According to the University of Washington report, "Although IAS Online can be used to collect information on courses delivered in a variety of modes, it is most appropriately used when students spend at least a portion of their instructional time on the Internet" (University of Washington, 2003, IAS Online section, ¶ 1).

As the first step in on-line SRIC form development at USU, use of the IAS Online form could be considered. As explained in the procedures and methods section of the main study, the on-campus USU SRIC form was adopted from the University of Washington IAS (see p. 59); therefore, the items on the IAS Online form should be similar to the USU SRIC items, making IAS Online an appropriate basis for the development of an on-line version of the USU SRIC form.

SRIC and Noninstructional Variables

The analysis of relationships between USU SRIC and individual noninstructional variables yielded only one educationally significant relationship: Students expecting higher grades in a course tended to give higher SRIC than did students expecting lower grades in on-campus, off-campus face-to-face, and distance education courses. The

educationally significant finding on expected grade was consistent with the findings from prior studies for on-campus courses (Abrami et al., 1980; Feldman, 1976; Greenwald & Gillmore, 1997; Peterson & Cooper, 1980; Shin, 1992a).

The finding raises a perplexing question: Should the relationship with expected grades be removed from USU SRIC? Greenwald and Gillmore (1997) claimed that the "unwanted influence" of expected grades is a "removable contaminant" of SRIC, and proposed statistical adjustments to "remove the influence" of expected grades from SRIC.

However, McKeachie (1997) disagreed about "the wisdom of applying statistical corrections for such contextual influences" (p. 1218). As McKeachie noted, expected grades could be related to teaching effectiveness–the excellent teacher's students might anticipate higher grades because they know about the teacher's great teaching effectiveness. In that case, to remove the covariation with expected grade from SRIC would reduce the validity of SRIC based on teaching effectiveness or, conversely, lack of effectiveness.

Also, the analysis of relationships between USU SRIC and individual noninstructional variables yielded an unexpected finding: No noninstructional variables other than expected grade had any educationally significant relationships with USU SRIC in the three instructional delivery groups. In the literature review, for example, class size was identified as a noninstructional variable that might be associated with SRIC at an educationally significant level. Even though the direction of the association with SRIC (i.e., smaller classes tended to receive higher ratings) was consistent with the results in the reviewed studies, the magnitude was not educationally significant. No reason for this unexpected finding is obvious at this point; however, further study of noninstructional

variables and the USU SRIC would be helpful to determine if the same lack of correlations would be found.

After the analysis of individual noninstructional variables with USU SRIC, the associations between USU SRIC and the entire set of noninstructional variables were examined, and those correlations were greater at an educationally significant level than the correlations for expected grade alone in the three instructional delivery groups. For on-campus courses, the associations were found to be similar to those discussed in the literature review. The 10 noninstructional variables accounted for approximately 9% of the variance in SRIC mean scores. Similarly, Marsh (1980) found that his nine noninstructional variables accounted for approximately 9% of the variance in overall instructor ratings and 20% of the variance in overall course ratings for on-campus courses. Separate overall ratings for instructor and course were not analyzed in my study.

A close look at Marsh's study revealed that the majority of the variance in overall course SRIC was explained by the variables of prior interest in the subject ($r^2 = .11$, $U = .03$), expected grade ($r^2 = .04$, $U = .06$), and workload/difficulty ($r^2 = .05$, $U = .09$). Marsh's correlation between SRIC and prior interest in the subject was higher than what I found in my study ($r^2 = .01$, $U = .01$), but his correlation between SRIC and expected grade was lower than my result ($r^2 = .07$, $U = .05$). These variations could be due to the different populations. As McKeachie (1997) discussed, colleges and universities have their own dominant cultures, and that may account for the magnitude differences between my study and Marsh's study.

The workload variable, however, needs more attention, because Marsh defined it as a noninstructional variable, while workload is a part of USU SRIC as an item,

"Appropriateness of workload to course goal(s) was..." (COURSE 4 item). As can be observed on Table 10 (page 87), USU workload item ratings were highly correlated with USU SRIC total (mean) scores ($r_{\text{on-campus}} = .77$; $r_{\text{off-campus face-to-face}} = .79$; $r_{\text{distance education}} = .79$). If this item had been designated as a noninstructional variable, rather than having it in the SRIC form, as in Marsh's study, the variance in USU SRIC explained by the set of noninstructional variables would have been more than 9%. However, Marsh investigated SRIC only in on-campus courses, and there is no other study with results that can be compared to my results for off-campus courses.

While the 10 on-campus noninstructional variables accounted for approximately 9% of the variance in SRIC mean scores, 11% and 15% of the total variance was explained by the 13 noninstructional variables for off-campus face-to-face and distance education courses. Also, there were educationally significant relationships without expected grades as a noninstructional variable for off-campus face-to-face ($R^2 = .06$) and distance education courses ($R^2 = .10$).

Interestingly, the 13 distance-education noninstructional variables accounted for more variance, at an educationally significant level, in SRIC than did the 10 on-campus noninstructional variables. That was due to the distance-education-specific noninstructional variables, site size and host/remote-site. Although these variables were not associated with SRIC at educationally significant levels individually, together they added sufficient explanatory power to increase the R^2s to educationally significant levels. The finding indicates that these distance-education-specific variables need to be discussed in detail, which follows in the next section.

Distance-Education-Specific Noninstructional Variables

Two crucial differences between on-campus and distance education courses are reflected in the two noninstructional variables that contributed to the educationally significant correlations with SRIC scores. First, unlike on-campus students, distance educational students are typically physically separated from their instructors and must communicate through electronic instructional technology. The only exception is those students taking their courses at the sites where the instruction originates for transmission to remote sites. Second, a distance-education class consists of two or more physical classrooms. That is, even though class sizes may be the same for distance education and on-campus courses, the distance-education students in a class are disbursed at two or more sites.

Site size in this study was defined as the number of students in a physical classroom at a host or remote site. In my literature review, an assumption was made that distance-education students may be less sensitive to their class size (as contrasted with site size) as compared to students in on-campus courses. This is because they are not physically in the same classroom with all their classmates (i.e., the class), even though the technology in all courses allows distance education students to do some talking across the sites during their class sessions.

Was site size related to USU SRIC for distance education courses? No, not at an educationally significant level. However, as expected, while the correlation between SRIC and class size for distance education courses was almost zero (r = -.02), a larger, although weak, negative correlation betwen site size and USU SRIC was observed (r = -.09). Students in distance education courses were apparently less sensitive to class

size than site size, recognizing their site group as an instructional unit, not a class. In fact, the zero-order correlations between class size and USU SRIC were -.12 for on-campus courses and -.17 for off-campus face-to-face courses, more similar to the site size association with SRIC (-.09) in distance education courses than to the class size association (-.02).

This finding suggests that students in distance education courses may have a different concept of "class" than their instructors or university administrators. For example, when distance-education instructors say in their lectures, "You may discuss with your classmates," some students may think about discussing only with their classmates at their own sites. In fact, when I asked distance-education students in a survey, "How many classmates do you have in your class?" the majority of them answered with the number of their site classmates. This indicates that "class size" could conceptually refer to different units, the site or the class, and should be taken into account in future studies.

Another site-size related finding in the teacher immediacy study was that site size was correlated with the amount of interaction with the instructor reported by students. Students at smaller sites tended to report more interactions with their instructors and more questions asked of their instructors. This result could be expected for students at host sites, because there are opportunities to interact with their instructors before or after their classes when there are fewer students. However, the result was consistent across host and remote sites: Even at remote sites, the number of students is related to how many questions the students perceive they can ask of the instructor or how many answers an instructor can provide. The reason for this site size finding is not clear, because the

instructor is still dealing with the total class at multiple sites, and size of a host or remote site would seem to be irrelevant to the amount of potential for interaction. In addition, the number of students at remote sites varied from one to 38. An interesting question for future research is whether there is an optimal site size for technology-delivered distance education.

In the main study, host-site students tended to rate instructors higher than remote-site students did; however, the difference was not educationally significant. There is a lack of research in this area, with only two studies located for the literature review (see p. 32). In one study (Spooner et al., 1999), instructor and course differences were the likely causes of the site differences, so little was added to our knowledge about distance education SRIC.

The other study on the relationship between host-remote sites and SRIC was my social presence study. Three subcategories on a non-USU SRIC form—instruction/instructor, technology, and course management—were rated higher by host-site students than by remote-site students; however, only the course management difference was educationally significant. The findings from the main study were consistent with those from the social presence study in terms of direction—students at host sites tended to give higher SRIC than did students at remote sites. (As discussed above, the USU SRIC form does not include course management items, so the one educationally significant relationship from the social presence study could not be confirmed, further indicating the need to consider such items for distance education SRIC.) In order to investigate a theory that could potentially explain the SRIC difference

between host and remote sites, a teacher immediacy study on teacher immediacy was conducted.

Teacher Immediacy

The theory of teacher immediacy was developed by Andersen (1979). She explained immediacy behaviors as, "behaviors that reduce the distance between people. Distance reduction can be accomplished by decreasing the actual physical proximity or by reducing the psychological distance" (p. 544). She found that "teacher immediacy predicted 46% of the variance in student affect toward the course instructor" (p. 543). Because instructors in distance education are physically separated from remote-site students, physical proximity cannot be manipulated by the instructor or the students. Therefore, my assumption was that teacher immediacy would be at lower levels at remote sites than at host sites.

As expected, teacher immediacy had educationally significant associations with the host/remote-site variable, and with the amount of reported interaction: Students at host sites scored teacher immediacy higher and students who reported more interaction with their instructors scored teacher immediacy higher. These findings indicated that teacher immediacy could also be associated with student satisfaction or perceptions of teaching effectiveness, or, in other words, with SRIC. The relationship between teacher immediacy and USU SRIC was not investigated, because SRIC were obtained from the normal university administration of the forms, and students' teacher immediacy surveys could not be matched with their USU SRIC forms. However, a possible connection to teacher immediacy can be gleaned from the USU SRIC factor analyses.

As discussed earlier, "Course/Instruction" and "Interaction Opportunities/Helpfulness" were USU SRIC factors found for distance education courses. What if the relationships between noninstructional variables and these two USU SRIC factors were investigated separately in distance education courses? In the main study, factor-based SRIC scores were not used for the analysis of correlations between SRIC and noninstructional variables, in part because factor loading patterns among the three instructional delivery groups were not consistent. However, there is evidence from my studies that the amount of reported interaction with the instructor is associated with teacher immediacy, host/remote, and site size. Assuming that the factorial structure found in this study is confirmed, the use of USU SRIC "Interaction Opportunities/Helpfulness" factor-based scores in future studies could provide interesting evidence on student satisfaction with instructors in distance education versus on-campus and off-campus face-to-face courses, as well as yield different SRIC-noninstructional variable relationships for the groups.

In future research using USU SRIC "Interaction Opportunities/Helpfulness" factor-based scores, the potential for high interfactor correlations should be a consideration. A medium magnitude of interfactor correlations was expected for the USU SRIC factors. Marsh (1984) and Marsh and Dunkin (1992) reported interfactor correlations for their nine SRIC factors that ranged between .30 and .60. The interfactor correlation for distance education courses in my main study was .78 (r^2 = .61). However, as long as the interfactor correlation is not 1.00, some variance in SRIC remains unaccounted for. And, in fact, with r^2 = .61, approximately 39% of the variance was not

accounted for. That is sufficient unique variance to justify research using "Interaction Opportunities/Helpfulness" factor-based scores.

Another consideration for future research is that my teacher immediacy study for teacher immediacy and noninstructional variables was conducted during summer semester, whereas the original study was conducted with spring semester students. It was assumed that off-campus students tend to take courses year-around, so that the summer semester population would be similar to the spring semester population. However, data were not available to establish comparability and the results for summer semester may not be the same as would have been obtained fall and spring semesters. In future research, this potential discrepancy can be avoided or checked and the problem of not being able to correlate teacher immediacy scores with SRIC eliminated, in the planning of study design and instrument administration.

Administration-Related Noninstructional Variables for Off-Campus Courses

The administration-related noninstructional variables for on-campus courses identified in my literature review have been controlled in on-campus SRIC administration at USU, as at many other universities, so could not be associated with USU SRIC. However, other administration-related noninstructional variables may have educationally significant relationships with USU SRIC in off-campus courses. For example, the time that courses are held is a noninstructional variable that may be related to SRIC. Most off-campus courses are held in the evening, sometimes continuing until 11:00 p.m., and teaching in late-hour courses may not be as effective, or seen to be as effective, as for courses in earlier hours. In fact, I did some additional analyses on SRIC differences

between late evening courses and other off-campus courses (both off-campus face-to-face and distance education courses). The USU SRIC mean score was lower for those courses that ended at or after 10:30 p.m. (mean = 4.47), than for those courses that ended earlier (mean = 4.82). The $d = .35$ is not educationally significant; however, this result suggests another area worth investigating in future studies of SRIC in off-campus courses.

Conclusion

This dissertation research yielded several findings that contribute to knowledge about SRIC in higher education. Unexpected results include the inconsistent factor loading patterns among the instructional delivery groups and finding only one educationally significant association between a noninstructional variable, expected grade, and SRIC. Some findings were consistent with existing research findings, such as the association between SRIC and expected grade for on-campus courses. Other findings, such as the identification of distance-education-specific noninstructional variables and evidence on the noninstructional-variable-related theory of teacher immediacy, suggest future directions for research on student satisfaction and perception of teaching effectiveness in distance education.

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APPENDICES

Appendix A. On-Campus Education Courses in Spring 2000

Table A40

On-Campus Courses in Spring 2000

Course	Course number	College	# of sections	15th day registration	End of sem. registration	Scanned form	Return rate
ADVS	1110	AGR	1	36	33	22	66.7
PLSC	2200	AGR	1	42	44	39	88.6
PLSC	3050	AGR	1	43	42	27	64.3
PLSC	3300	AGR	1	26	26	21	80.8
PLSC	4500	AGR	1	28	26	23	88.5
PSB	4890	AGR	1	19	19	10	52.6
PSB	4890	AGR	1	18	18	14	77.8
ACCT	2010	BUS	6	429	414	284	68.6
ACCT	2020	BUS	2	329	320	177	55.3
ACCT	3120	BUS	2	76	75	69	92.0
ACCT	3310	BUS	1	44	42	37	88.1
ACCT	6350	BUS	1	28	28	22	78.6
BA	4550	BUS	2	74	74	66	89.2
BIS	1400	BUS	13	640	623	442	70.9
BIS	1410	BUS	2	59	57	36	63.2
BIS	1420	BUS	2	59	57	36	63.2
BIS	1550	BUS	1	32	32	27	84.4
BIS	2300	BUS	1	58	57	51	89.5
BIS	2400	BUS	3	75	67	47	70.1
BIS	2450	BUS	7	465	450	301	66.9
BIS	2550	BUS	8	313	302	226	74.8
BIS	2600	BUS	1	20	19	15	78.9
BIS	3100	BUS	2	139	135	96	71.1
BIS	3330	BUS	1	67	62	44	71.0
BIS	5300	BUS	1	52	52	37	71.2
BIS	5700	BUS	2	134	134	106	79.1
BIS	6300	BUS	1	39	37	28	75.7
BIS	5450/ 6450	BUS	1	21	21	19	90.5

(*table continues*)

Course	Course number	College	# of sections	15th day registration	End of sem. registration	Scanned form	Return rate
ECON	1500	BUS	2	554	532	344	64.7
ECON	2010	BUS	4	440	434	233	53.7
ECON	3400	BUS	3	291	288	207	71.9
ECON	4010	BUS	1	42	39	28	71.8
ECON	5680	BUS	1	35	31	22	71.0
MHR	2990	BUS	5	396	390	246	63.1
MHR	4890	BUS	2	136	135	101	74.8
MHR	6630	BUS	1	9	9	7	77.8
MHR	6890	BUS	3	51	61	47	77.0
ELED	3100	ED	2	45	45	39	86.7
ELED	4000	ED	2	61	61	55	90.2
ELED	4030	ED	2	64	64	60	93.8
ELED	4040	ED	2	64	64	56	87.5
ELED	4050	ED	2	64	64	62	96.9
ELED	4060	ED	2	64	64	56	87.5
HEP	3500	ED	1	27	26	26	100.0
HEP	5700	ED	2	10	10	9	90.0
PE	1230	ED	1	15	15	12	80.0
PE	1300	ED	4	158	153	116	75.8
PE	1330	ED	4	122	115	70	60.9
PEP	3050	ED	3	87	84	67	79.8
PSY	1010	ED	2	453	444	170	38.3
PSY	1210	ED	1	34	34	18	52.9
PSY	1220	ED	1	179	179	75	41.9
PSY	1730	ED	3	88	83	54	65.1
PSY	2800	ED	1	76	72	50	69.4
PSY	3660	ED	1	90	89	62	69.7
PSY	4210	ED	1	25	25	20	80.0
REH	6120	ED	1	13	13	10	76.9
SPED	4000	ED	3	216	215	169	78.6

(*table continues*)

Course	Course number	College	# of sections	15th day registration	End of sem. registration	Scanned form	Return rate
SPED	5050	ED	1	51	50	47	94.0
FHD	1500	FL	2	320	313	181	57.8
FHD	3130	FL	1	74	72	58	80.6
FHD	3210	FL	1	128	128	92	71.9
FHD	3530	FL	1	91	91	60	65.9
FHD	4240	FL	1	82	81	61	75.3
FHD/PSY	3120	FL	1	102	102	77	75.5
ANTH	1030	HAS	1	96	90	62	68.9
ART	2720	HAS	1	158	154	82	53.2
ART	2810	HAS	2	51	49	36	73.5
ART	3810	HAS	1	25	24	15	62.5
ART	3830	HAS	1	40	39	29	74.4
ENGL	1010	HAS	28	648	624	447	71.6
ENGL	2010	HAS	35	848	831	668	80.4
ENGL	4220	HAS	1	20	20	17	85.0
ENGL	4300	HAS	1	27	27	24	88.9
ENGL	4510	HAS	1	14	13	12	92.3
HIST	1040	HAS	1	51	50	51	102.0
HIST	1700	HAS	1	182	175	82	46.9
HIST	2710	HAS	1	92	88	67	76.1
HIST	4290	HAS	1	42	40	28	70.0
LAEP	1030	HAS	1	124	117	71	60.7
MUSC	1550	HAS	1	32	30	21	70.0
MUSC	3260	HAS	1	38	38	36	94.7
PHIL	2400	HAS	1	93	89	42	47.2
POLS	1100	HAS	1	205	195	136	69.7
SOC	1020	HAS	2	92	86	51	59.3
SOC	3120	HAS	2	51	51	43	84.3
SPAN	1020	HAS	3	64	61	48	78.7

(*table continues*)

Course	Course number	College	# of sections	15th day registration	End of sem. registration	Scanned form	Return rate
SPCH	1050	HAS	1	70	70	59	84.3
SW	2500	HAS	1	41	40	33	82.5
FW	1200	NR	1	79	75	48	64.0
FW	2200	NR	1	56	56	53	94.6
GEOG	1130	NR	2	374	366	272	74.3
NR	1010	NR	1	57	56	44	78.6
BIOL	1010	SCI	2	555	540	210	38.9
BIOL	1220	SCI	2	396	362	264	72.9
BIOL	1240	SCI	1	264	255	166	65.1
BIOL	2010	SCI	1	250	227	143	63.0
CHEM	1010	SCI	1	101	96	46	47.9
CHEM	1120	SCI	1	53	51	41	80.4
CHEM	1210	SCI	1	187	170	99	58.2
CHEM	1220	SCI	2	238	210	123	58.6
CS	1700	SCI	2	205	191	105	55.0
CS	3100	SCI	1	55	52	27	51.9
MATH	0900	SCI	6	192	184	103	56.0
MATH	1010	SCI	13	476	449	279	62.1
MATH	1050	SCI	17	673	630	455	72.2
MATH	1060	SCI	5	156	152	111	73.0
MATH	1100	SCI	9	333	305	216	70.8
MATH	1210	SCI	5	220	207	154	74.4
MATH	2020	SCI	3	86	84	73	86.9
PHYX	2210	SCI	1	73	70	55	78.6
STAT	1040	SCI	9	414	400	275	68.8
STAT	2300	SCI	1	303	299	203	67.9
TOTAL				4015	3777	2508	66.4

Appendix B. Petersen's Study

FACTORS AFFECTING STUDENT COURSE EVALUATIONS

May 11, 1999

A simple model was used to investigate the determinants of student course evaluations at USU. It hypothesized that the average course effectiveness score is a function of course grade point average, course size, course level, and the college in which the course is taught. Multiple regression analysis was used and the data consisted of a random sample of 479 on-campus courses (about one-third of all courses which were taught and evaluated) during Fall Semester, 1998.

Dependent Variable: Course Effectiveness (average score for course, possible values 1-6)

Independent Variables:

Course size	Number of students enrolled
GPA	Course GPA
Course level	Dummy variable for lower division, upper division, and graduate (possible values 0,1). Base used was lower division, so the upper division and graduate dummy variables were included in the equation.
College	Dummy variable for college (possible values 0,1). Base used was Science, so dummy variables for the other seven colleges were included in the regression equation.

RESULTS n= 479 $R^2 = 0.15$

Variable	Coefficient	t-statistic	Significant?
Constant	3.705		
Course size	-0.001	-1.67	5% (one-tail)
GPA	0.394	5.97	1%
Upper division	-0.106	-0.69	no
Graduate	0.053	0.50	no
College			
Agric.	0.096	0.94	no
Bus.	0.025	0.21	no
Educ.	-0.110	-0.82	no
Eng.	0.060	0.64	no
Fam. Life	0.070	0.45	no
HASS	-0.150	-2.32	5%
Nat. Res.	0.040	0.45	no

Only three coefficients are statistically significant. These suggest (all other variables held constant) that course evaluations increase with GPA and decrease with course size and if the class is taught in HASS compared to Science. However, only 15% of the total variation in course evaluations can be explained by the variables used in the analysis. Apparently, other factors are the primary determinants of perceived course effectiveness.

Appendix C. University of Washington

Instructional Assessment System (IAS)

Items by Subsections

Table C41

University of Washington Instructional Assessment System (IAS) Items

Sections	Questions
To provide a general evaluation	1. The course as a whole was
	2. The course content was
	3. The instructor's contribution to the course was
	4. The instructor's effectiveness in teaching the subject matter was
Provide information about the course to other students	1. Use of class time was
	2. Instructor's interest in whether students learned was
	3. Amount you learned in the course was
	4. Relevance and usefulness of course content is
	5. Evaluative and grading techniques (tests, papers, projects, etc.) were
	6. Reasonableness of assigned work was
	7. Clarity of student responsibilities and requirements was
To provide diagnostic feedback to the instructor	1. Course organization was
	2. Clarity of instructor's voice was
	3. Explanations by instructor were
	4. Instructor's ability to present alternative explanations when needed was
	5. Instructor's use of examples and illustrations was
	6. Quality of questions or problems raised by instructor was
	7. Student confidence in instructor's knowledge was
	8. Instructor's enthusiasm was
	9. Encouragement given students to express themselves was
	10. Answers to student questions were
	11. Availability of extra help when needed was

Appendix D. Course Interaction Survey for Distance Education Courses

This survey was created by a graduate student in the Department of Psychology. Please take a few minutes to answer the items.

Your help with this research is much appreciated. In appreciation, you will have a chance to win $25.

When you complete this survey and return it to your site coordinator, you will automatically have a chance to **win a $25 casher's check!** 10 winners will be selected from the completed surveys!

This sheet will be separated from the survey after completion of the all items is verified. Data will then be processed and your answers will be totally confidential.

Last Name _____ First Name _____

Student ID Number _____ – _____ – _____

Address (where $25 will be sent) Street _____

City _____ State _____ Zip _____

Course Name & Number _____ for example, PSY 1010

Your Instructor's Name _____

Your site location is _____

COURSE INTERACTION SURVEY

This questionnaire was created to evaluate how students feel about their interaction with teachers and other students during distance education courses at Utah State University.

Please take a few minutes to answer this survey. Check the most appropriate response. Your responses on this survey will be confidential and used only for research purposes. Thank you for your help!

ABOUT YOUR INSTRUCTOR – Verbal Behavior		Never	Rarely	Occasionally	Often	Very Often
1	Uses personal examples or talks about experiences she/he has had outside of class					
2	Asks questions or encourages students to talk					
3	Gets into discussions based on something a student brings up even when this doesn't seem to be part of his/her lecture plan					
4	Uses humor in class					
5	Addresses students by name					
6	Addresses me by name					
7	Gets into conversations with individual students before or after class					
8	Has initiated conversations with me before, after, or outside of class					
9	Refers to class as "our" class or "we" are doing					
10	Provides feedback on my individual work through comments on papers, oral discussions, etc.					
11	Calls on students to answer questions even if they have not indicated that they want to talk					
12	Asks how students feel about an assignment, due date, or discussion topic					
13	Invites students to telephone or meet with him/her outside of class if they have questions or want to discuss something					
14	Asks questions that solicit viewpoints or opinions					
15	Praises students' work, action, or comments					
16	Will have discussions about things unrelated to class with individual students or with the class as a whole					
17	Is addressed by his/her first name by the students					

ABOUT YOUR INSTRUCTOR – Nonverbal Behavior	Never	Rarely	Occasionally	Often	Very Often
1 Sits behind desk while teaching					
2 Gestures while talking to class					
3 Uses monotone/dull voice when talking to class					
4 Looks at class while talking					
5 Smiles at the class as a whole, not just individual students					
6 Has a very tense body position while talking to the class					
7 Touches students in the class					
8 Moves around the classroom while teaching					
9 Looks at the board or notes while talking to the class					
10 Stands behind the podium or desk while teaching					
11 Has a very relaxed body position while talking to the class					
12 Smiles at individual students in the class					
13 Uses a variety of vocal expressions while talking to the class					

INTERACTIONS AND SITE SIZE

1. How many classmate(s) do you have **at your site** (in your physical classroom) for this class? ___ students
2. How do you feel about the site size? ( ) The site size is about right.
   (please check only one) ( ) It would be better if there were more students at my site in this class.
   ( ) It would be better if there were fewer students at my site in this class.
3. What would be the ideal site size for effective learning?
   _____ students at your site

		Never (0 time)	Rarely (1-3 times)	Occasionally (4-6 times)	Often (7-9 times)	Very Often (+ 10 times)
4 During this course, how many times in this term did you interact with your	Instructor?					
	Classmates at your site?					
	Classmates at other locations?					
5 How many times in this term did you study with your classmates for this course?						
6 How many times in this term did you ask questions of your	Instructor?					
	Classmates at your site?					
	Classmates at other locations?					
7 How many times in this term did you want to ask a question, but were not able to do so of your	Instructor?					
	Classmates at your site?					
	Classmates at other locations?					

Appendix E. Letter to Instructors 1

Utah State UNIVERSITY

INFORMATION AND LEARNING RESOURCES
Office of the Dean/CIO
3065 Old Main Hill
Logan UT 84322-3065
Telephone: (435) 797-2645
FAX: (435) 797-2650

June 14, 2000

Dear

Between June 19 and June 30, 2000 we will be conducting an important research project dealing with distance learning and a concept titled "instructor immediacy." Basically we want to find out if this concept is any different in a distance education environment and in a face to face environment. One of the steps in this study is to establish the relationship(s) between instructor immediacy and course evaluations.

To that end we are requesting you to allow Noriko Saeki to administer a brief survey (one page–both sides) to your students to help us better understand instructor immediacy. This survey should take about 5-10 minutes and will be handed to your students before class begins and collected from them at the end of class, thus minimizing any disruptions. We have IRB clearance to conduct this study.

Noriko will contact you (either by phone or email) to set up a date to administer the survey. If you have any questions please contact us at one of the numbers below.

Thank you in advance for your help. We appreciate the limited time in class you have and your willingness to share that with us.

Sincerely,

Byron R. Burnham, Associate Dean
Information and Learning Resources
797-1637

Noriko Saeki
PhD Candidate
755-8655
SLHZK@cc.usu.edu

Appendix F. Letter to Instructors 2

NORIKO SAEKI

July 5, 2000

Dr. XXX:

Thank you for helping me conducting my survey in your class on such a busy summer day. Your cooperation was very meaningful to my dissertation research.

Within the next couple of weeks, I will finish up the data entry, and the final summary report will be available within the next few months.

When I finish the final summary report including all classes, I will send you a copy. Additionally, if you are interested in the summary from your course, I will also send it out to you upon request (please let me know by e-mail).

Again, I really appreciate your cooperation.

Sincerely,

Noriko Saeki
Ph.D. Candidate
Department of Psychology
Utah State University
Logan, UT 84322-2810
Email: SLHZK@cc.usu.edu
Tel: (435) 755-8655

Cc: Byron R. Burnham

VITA

NORIKO SAEKI

548 Oakwood Trail
Twin Lakes, WI 53181
Tel & Fax: (262) 877-9898
Email: noriko@charter.net

EDUCATION

Utah State University, Logan, Utah

Doctor of Philosophy	Anticipated date of graduation in August 2003 Research and Evaluation Methodology Program Dissertation Title: On-campus and Off-campus Students' Ratings of Instruction and Courses
Master of Science	Psychology, October 1997 Research and Evaluation Methodology Program Thesis Title: *Differences in Creative Thinking Between American and Japanese College Students in Education*
Bachelor of Art	Psychology, June 1994

Tsuru University, Yamanashi, Japan

Bachelors of Art	Educational Psychology in Elementary Education, March 1992 Teaching Certificate, Elementary Education, 1992 Teaching Certificate, Secondary Education, English, 1992

WORK EXPERIENCE

Senior Research Analyst
Allstate Insurance Company, Northbrook, Illinois (November 2000 – Present)
Within Research and Development Department,

- Performed statistical analyses on large data sets
- Managed quarterly projects and delivered the outcome on time
- Created presentation materials and presented to the wide-ranged background internal customers
- Consulted product operation teams on Strategic Risk Management projects and provided recommendations for internal customers

- Created training materials to broaden current data mining skills
- Mentored incoming hires

Consultant, Data Coordinator
Van Dusen Consulting, Inc. Logan, Utah (October 1999 – August 2000)
Evaluation Project for Junior Achievement Programs

- Performed statistical analyses and data management, library research
- Supervised undergraduate research assistants
- Conducted site visits for data collection purposes

Summer Intern in Market Research in New Assessment Development
ACT, Inc. Iowa City, Iowa (June 1999 - July 1999)
Internship in Workforce Development Division

- Assisted in new product test development for the Work Keys System
- Conducted market research to examine needs assessment in the Work Habit skills for corporate settings and for a better transition from school to work
- Identified alternative assessments and services, and created lists of alternatives
- Outlined a telephone survey approach as preliminary market research for determining client needs
- Introduced Computer Assisted Telephone Survey (CATI) methodology on the survey in market research, and outlined ACCESS database

Graduate Teaching Assistant
Department of Psychology, Utah State University (January 1999 - December 1999)

- Assisted in Social Psychology, Developmental Psychology, and Physiological Psychology

Graduate Research Assistant
School of Graduate Studies, Utah State University (October 1996 - December 1999)

- Developed a system for estimating tuition waiver budgets, using performance from the previous three years. As the result, doctoral graduate assistants will be able to get in-state-tuition waivers based on their FTE amounts, beginning in fall of 2000
- Designed and implemented a student tracking Access database for the Dean's office. Using the database, we
  - Produced analyses and reports in SPSS, and transferred data to the central database
  - Maintained all graduate school applicants' data appropriately
  - Retrieved updated data promptly from various format sources
- Conducted data management and statistical analyses for graduate research assistants working on Dean's office projects.
- Coordinated the needs assessment and evaluation projects associated with the 1997 and 1998 International Teaching Assistants Workshop Follow-up Pilot

Project, a project developed at the university to enhance the teaching skills of international students placed as teaching assistants in academic departments.

Department of Psychology, Utah State University (September 1994 - September 1996)
Evaluation Project for Junior Achievement Programs
General Research Assistant

- Statistical and Data management, Library research, Data analysis
- Conducted site visits for data collection purposes
- Teaching assistant (grading)

PUBLICATIONS

Van Dusen, L. M., Borman, D., & Saeki, N. (2000) *Comprehensive Summative Evaluation of Junior Achievement's High School Programs.* A summative evaluation report submitted to Junior Achievement. Logan, UT: Western Institute for Research and Evaluation.

Saeki, N., Fan, X., & Van Dusen, L. M. (2001). A comparative study of creative thinking of American and Japanese college students. *Journal of Creative Behavior, 35*, 24-36.

PRESENTATIONS

Saeki, N. & Burnham, B. (2000, November) *Distance learners' needs and satisfaction - Depend on instructional medium?* Paper will be presented at the Annual Meeting of the American Evaluation Association, Waikiki, HA.

Saeki, N. (1999, November). *On-campus vs. off-campus student course evaluations: social presence and deindividuation.* Paper presented at the Annual Meeting of the American Evaluation Association, Orlando, FL.

Saeki, N. (1999, November). *Social psychological aspects of computer-mediated communication in education.* Paper presented at the Annual Meeting of the American Evaluation Association, Orlando, FL.

Saeki, N., & Fan, X. (1999, June). *Scoring system reliability for international figure skating events: generalizability analysis for 1998 Winter Olympics.* Paper presented at the 46th Annual Meeting of the American College of Sports Medicine, Seattle, WA.

Saeki, N., Fan, X., & Van Dusen, L. M. (1998, May). *American college students are more creative than Japanese college students.* Paper presented at the 10th Annual Convention of the American Psychological Society, Washington D. C.

REVIEWER

Ad-hoc reviewer for *Journal of Creative Behavior*

TRANING ATTENDED

Designing On-line Surveys, American Evaluation Association Conference, 1999
SAS Programming I, SAS Institute, 2001
SAS Programming II, SAS Institute, 2002

COMPUTER SKILLS

SPSS, SAS, MS ACCESS, MS EXCEL, MS WORD, MS POWER POINT, MS PROJECT, BRIO Database

REFERENCES

Available upon request