The Construct Validity of the Principles of Edification as Measures of Edifying Teaching in the LDS Church Educational System

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THE CONSTRUCT VALIDITY OF THE PRINCIPLES
OF EDIFICATION AS MEASURES OF EDIFYING
TEACHING IN THE LDS CHURCH
EDUCATIONAL SYSTEM

by
Robert F. Elzey

A dissertation submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Instructional Psychology and Technology
Brigham Young University
November 1998
BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a dissertation submitted by

Robert F. Elzey

This dissertation has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

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Date
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Dec. 2, 1995
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Dec. 2, 1998
Date
R. Dwight Laws

Dec. 2, 1998
Date
Paul V. Johnson
As chair of the candidate's graduate committee, I have read the dissertation of Robert F. Elzey in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

Accepted for the Department

Accepted for College

BRIGHAM YOUNG UNIVERSITY
ABSTRACT

THE CONSTRUCT VALIDITY OF THE PRINCIPLES OF EDIFICATION AS MEASURES OF EDIFYING TEACHING IN THE LDS CHURCH EDUCATIONAL SYSTEM

Robert F. Elzey
Department of Instructional Psychology and Technology
Doctor of Philosophy

The degree of validity of various teacher evaluation systems in the Church Educational System (CES) of the Church of Jesus Christ of Latter-day Saints has been questioned. Despite several administrative and scholarly attempts, there has been an absence of an accepted set of dimensions for such measurement. In an effort to specify the desirable attributes and practices of religious educators, CES administrators have defined six CES values and seven principles of edification. One of these values is identified as Edifying Teaching. By CES definition, edification occurs when a student is built up spiritually. The seven principles of edification are believed to be important in fostering teaching that edifies. Although full-time employees have been trained on these
dimensions, they are not yet the basis for teacher evaluation. This study explores the dimensions upon which students evaluate their seminary teachers and the potential viability of using the principles of edification as measures. While students may conceptually understand the principles of edification, there is evidence that they are unable to apply them to an evaluation of their seminary teacher. Exploratory factor analysis of student’s ratings of their seminary teacher provides evidence that students discriminate upon the two dimensions of teacher-student relations and the teacher’s presentation manner or skill. The first of these two dimensions, teacher-student relations, accounts for 93% of the variance in this two-factor model.
ACKNOWLEDGMENTS

I acknowledge the hand of God in my life’s activities. His hand has been evident in my family endeavors, my church service, my CES career, as well as my academic pursuits. As an omniscient God who sees the entire journey, I am aware that he has repeatedly placed key people along my path in these various arenas at such seasonable moments.

I am grateful to Richard Sudweeks for his timely, critical insights and for motivating me in matters of measurement; I am grateful to Adrian Van Mondfrans for helping this project get launched in the early stages, and for sharing his expertise in evaluation issues; I am grateful to Victor Bunderson for his statistical brilliance which he offered at such a difficult time in his family life; I am grateful to Dwight Laws for his vision of the role that technology can play in building up the kingdom; I am grateful to Paul Johnson for truly being a CES “servant leader,” and I am grateful to Maggie Martinez for her assistance in familiarizing me with the software used in the data analysis.

Certainly, God’s greatest expression to me of seasonable, foresightful care is the blessing of such a remarkable companion, Lee Ann. She has given herself to me through many selfless offerings, including enduring support of my academic pursuits. She has had a quiet vision and outlook for my educational goals that, at times, has been far
beyond my own (which tends to wallow in the memories of my High School remedial English class).

Finally, I acknowledge the grace of God, offered through the bounteous mercy and love of Jesus Christ. His grace has provided strength and assistance in this and other pursuits that has endowed me with abilities far beyond my own limited reach.
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CHAPTER 1

Introduction

In the fall of 1912, President Frank Y. Taylor, President of the Granite LDS Stake, borrowed $2,500 on a note from Zion's Savings Bank for the Granite Stake. With these funds, land was purchased across from Granite High School and a building was erected with the intent of supplementing secular education with religious education. Thomas J. Yates was invited to be the instructor and contracted for a salary of $100 a month. Upon parent request, students were released from Granite High School during one of their six periods. Thus, the first Seminary class got underway. Seventy students were enrolled that first year. The idea spread rapidly among other LDS stakes and by 1918 there were thirteen seminaries with a total of 1,528 students enrolled. In the 1950's a new offering was instituted. Non-released-time seminaries began to be established with weekday classes being held before the regular school day began. At the present time, there are approximately 700,000 students enrolled in religious education classes in more than 130 countries and territories. With an ever-increasing worldwide scope of LDS religious education, refinement of purpose and practices has been a vital concern of priesthood authorities, religious education administrators and interested researchers. As the scope of LDS religious education has changed and grown, its mission has had to change correspondingly. What was once a Utah "Wasatch Front phenomenon" is now a worldwide institution. Correspondingly, as LDS religious education has grown worldwide, issues relating to teacher evaluation have become increasingly complex.
CHAPTER 2

Review of Literature

History of Evaluation in the LDS Church Educational System

In 1970, Thomas S. Monson, of the Council of the Twelve Apostles of the Church of Jesus Christ of Latter-day Saints, announced a new church teacher development program to be implemented. Monson said,

Are wise shepherds, even skilled and righteous teachers, needed today? Our fast-moving jet-propelled world harbors pressures and temptations not previously known . . . The goal of gospel teaching today, as emphasized in the teacher development program, is not to “pour information” into the minds of class members. It is not to show how much a teacher knows, nor is it merely to increase knowledge about the Church. The basic goal of teaching in the Church is to help bring about worthwhile changes in the lives of boys and girls, men and women. The aim is to inspire the individual to think about, feel about, and then do something about living gospel principles (1970, p. 101).

After outlining the implementation of the church teacher development program, Monson stated,

A cardinal principle of industrial management teaches: “When performance is measured, performance improves. When performance is measured and reported, the rate of improvement accelerates.” I think the visit to your stakes by the General Authorities will bring the desired acceleration (1970, p. 101).
This emphasis on the effective measurement, reporting, and improvement of teacher performance has been an impetus for teacher evaluation among LDS religious educators. Nonetheless, Blount (1974) postulated that among mankind's perpetual pursuits are "the Holy Grail, the Fountain of Youth, and a defensible measure of teacher effectiveness" (p. V). As religious educators in the LDS Church Educational System (CES) have pursued the task of teaching to edify (or to build spiritually), a defensible evaluation system has been difficult to design and implement. Myriads of attempts have been made, each facing its own unique challenges.

One of the first incorporated approaches to the evaluation of CES teacher performance was a system based upon the merit rating of teachers. Merit ratings were based upon the observations and recommendations of a teacher's supervisor. An Exceptional Teacher rating (as opposed to Fine Contributing Teacher, or Probation ratings) warranted a bonus in salary. In time, the validity of these merit ratings was questioned. Critics asserted that the assigning of merit ratings was more a reflection of the supervisor making the rating than of the teacher being rated. In 1969, given the questioned validity of the teacher evaluation system ratings, merit ratings were no longer associated with salary increase (C. Schramm, personal communication, February 1997).

An instrument to evaluate seminary teacher effectiveness that has undergone numerous rigorous studies is the Student's Evaluation of Seminary (SES). The instrument drew heavily upon the graduate work in counseling of Wendell Johnson (1961) at Boston College. Johnson had developed a twenty-five-item rating form for assessing counselor-client rapport as rated by the client. From 1964-1968, a fifty-three-item revision of
Johnson's instrument was used by the Department of Seminaries and Institutes of Religion for evaluating prospective seminary teachers.

Yet another revision was made in 1968, developing a thirty-item short-form of the previously developed fifty-three-item instrument. This short form, sometimes called TE 30, was used to evaluate prospective seminary teachers from 1968-1972.

As a separate outgrowth of the fifty-three-item instrument, the draft version of the SES was developed. The SES was originally developed in 1968-69 by J. Alden Richins and a group of interested teachers in the Davis county area. This draft version contained seventy items and emphasized seven different constructs or scales. A revision of the seventy-item instrument led to the original published version of the SES which contained thirty-five items and emphasized seven constructs. In the first of several studies conducted to assess the effectiveness of the SES, Richins (1973) considered the reliability and validity of the instrument. Richins concluded in his study that the thirty-five-item SES was a reliable instrument for determining student feelings concerning seminary, but not necessarily as a measure of teacher effectiveness. In a careful study of the SES, Sudweeks (1979) concluded, the SES “appears to be a generalized rapport factor indicating to what extent a particular group of students like their teacher” (p. 22).

In summary, Sudweeks stated,

On the basis of these findings, CES Administrators are probably justified in interpreting a teacher's median rating on the SES composite scale as an indicator of the extent to which that teacher has or has not developed rapport with his students. Administrators who go beyond this and interpret ratings on the various
subscales as measures of a teacher's skill in methodology, his overall teaching
effectiveness, or his degree of preparation and organization are in danger of
making unwarranted inferences not supported by the data collected (1979, p. 22).

Versions of the SES were used widely in Seminaries from 1973 until 1991.

Boren (1984) studied CES teacher evaluation and proposed the need to establish an
"eclectic" or "broad-based approach involving administrative evaluation, teacher self-
evaluation, collegial evaluation and student evaluation" (p. 21).

In 1991, a CES Employee Evaluation Handbook was published. The published
evaluation system included measures of student achievement and attitudes as well as
teacher competencies. Data were gathered using 12 separate evaluation instruments.
While not necessarily motivated by the proposal made by Boren (1984), these
instruments include approaches involving administrative evaluation, teacher self-
evaluation, and student evaluation, but not collegial evaluation.

Addressing some of the issues raised by Sudweeks (1979), Lunt studied several
newly developed CES employee evaluation instruments found in the CES Employee
Evaluation Handbook. Lunt (1995) determined that CES could implement the CES
Employee Evaluation Handbook instruments as tools for measuring teacher and
administrator performance with confidence that they would yield reliable scores. These
instruments were confirmed to be reliable in internal consistency, with the items in each
subscale highly intercorrelated and all measuring the same general characteristic. The
instruments were also reliable in test/retest stability, confirming reliability from one
rating occasion to the next. Although reliability was confirmed, there were unsettled
feelings among CES employees regarding the use of these instruments as tools for measuring and improving teacher and administrator performance (Lunt, 1995). The implemented 1991 evaluation system has been met with resistance by teachers and administrators of the Church Educational System (R. Cole, personal communication, February 1997; Howell, 1995; Maughan, 1994; C. Schramm, personal communication, February 1997).

Although reliability (the stability across measurement occasions, equivalence across forms, or consistency across items within a scale) is a necessary prerequisite to validity, it is not sufficient to ensure validity (the accuracy, appropriateness, and comprehensiveness of measuring the specified qualities). Howell (1995) examined the congruence of teacher evaluation practices in CES with its institutionally stated purposes for which evaluation is to be conducted. In an ethnographic study, he found that "teachers described confusion regarding conflicting messages being communicated via teacher evaluation" (p. 86). He continued, "while the teachers suggest that teacher evaluation does clarify standards and expectations, there is little consensus regarding what those standards refer to and what they consist of" (p. 86). This finding demonstrates confusion and concerns regarding the validity of the constructs being evaluated.

Professional Teaching Standards and Teacher Functions

Similar confusion has existed in the evaluation of public school teachers. In 1983, there was an increase in public concern about American education when a federal report titled *A Nation at Risk* emerged. In 1986, the Carnegie Task Force on Teaching as a
Profession responded with a report titled *A Nation Prepared: Teachers for the 21st Century*. This report recommended the establishment of a National Board for Professional Teaching Standards. In 1987, such a board was organized. The National Board for Professional Teaching Standards (NBPTS) has established a central policy statement titled *What Teachers Should Know and Be Able to Do*. This statement contains five core propositions which purport to represent what NBPTS values and believes should be honored in teaching. These valued standards for teachers are being developed with complementary assessment tools. The five valued propositions which NBPTS believes should be honored in teaching include the following:

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students.
3. Teachers are responsible for managing and monitoring student learning.
4. Teachers think systematically about their practice and learn from experience.
5. Teachers are members of learning communities.

NBPTS provides information on the World Wide Web relating to the current research and development of these standards at http://www.nbpts.org/nbpts/standards/intro.html. This source states, “Excellence in teaching is the sum of human qualities like judgement and improvisation, expert knowledge and skill, and unflagging professional commitment.” The standards mentioned earlier were developed with the assistance of teachers and other experts and were then approved by the NBPTS board of directors. These standards were used to create a national standard for a certificate for experienced teachers.
Another institution that has contributed to defining professional teaching standards is the Educational Testing Service (ETS) in Princeton, New Jersey. Since ETS was first chartered in 1947 it has sought to develop principles and methodologies related to educational test design, scoring, scaling, interpretation, and reporting. Among other issues, ETS researchers investigate questions relating to the validity of measurement. In 1992, ETS published the results of national surveys dealing with the functions teachers perform (Rosenfeld, et al., 1992). To develop the surveys, committees of teachers, teacher educators and administrators were used to identify a list of the necessary functions for effective teachers. The surveys were then administered to a large sample of teachers, teacher educators, and administrators. Six major categories of functions were identified with little variation between the elementary school, middle school and secondary school levels. ETS purported that these six categories describe the six important sets of functions beginning teachers must perform. The sets of functions were used to develop entry-level teacher licensing examinations to be used by different states to assure that entering teachers were qualified. The six identified categories of functions include the following:

1. Planning and Preparing for Instruction
2. Managing the Classroom
3. Implementing Instruction
4. Evaluating Student Learning and Instructional Effectiveness
5. Administrative Responsibilities
6. Additional Professional Responsibilities
CES Values and Principles of Edification

CES has maintained a parallel history regarding the development of valued standards that administrators feel should be honored. Much like public school teacher evaluation, the most frequently mentioned concerns about CES evaluation instruments are problems related to validity. Often CES teachers and administrators express the concern that the measured criteria are not necessarily the most significant characteristics which church leadership has emphasized to CES (R. Cole, personal communication, February 1997).

In their discussion of structured observation schedules for evaluating teacher performance, Medley et al. (1984) proposed that,

The whole art of teacher evaluation up to the present consists of obtaining someone's subjective judgement of how “good” a teacher is, a judgement based on the assumption that the judge knows what good teaching is and can recognize it when he sees it (p. 29).

This highly subjective approach has generally been the case with former CES evaluation. With little basis for determining what “good” teacher performance is in the Seminary context, the standards for evaluation have often been arbitrary, and impressionistic. As a natural byproduct, CES teacher evaluation ratings have been interpreted by many as invalid (R. Cole, personal communication, February 1997).

In 1994, an employee handbook titled *Teaching the Gospel: A Handbook for CES Teachers and Leaders* was published. Rather than being an itemized policies and procedures handbook, this handbook was simply an articulation of the objectives and mission of CES. It established the philosophical and conceptual expectations of
priesthood leaders and CES employees. Prior to its publication, CES researchers reviewed the counsel given to CES employees by church authorities and CES administrators since the 1950's. From this review, they identified a list of core values or standards that are the expressed foundation of what CES should expect of employees. The six identified values include:

1. Doing God's Work
2. Understanding the Word of God
3. Living in Harmony With the Will of God
4. Edifying Teaching
5. Servant Leadership
6. Growing Toward Perfection

These constructs, or values, were identified and then ongoing employee training was conducted to establish an understanding of them. A three-year cycle of week-long summer workshops was held for each employee to introduce and reinforce these core values.

Notice that the CES values have corresponding dimensions to the NPBTS propositions. Proposition 1 addresses a teacher's commitment to students and their learning. In the values, the CES teacher is to place primary commitment on doing God's work. A CES handbook states, "Teaching the gospel is one of the most important ways of helping [God] accomplish his work" (Teaching the Gospel, p. 3). Proposition 2 focuses on a professional teacher's knowledge of the subject-matter and how to teach it. CES has two corresponding values: Understanding the Word of God and Edifying
**Teaching.** Proposition 5 relates to a professional teacher's participation in a learning community, inferring continued professional growth. Similarly, CES has identified the value of *Growth Toward Perfection*.

One of the CES values most directly related to the what religious educators do in the classroom is *Edifying Teaching*. By CES definition, edification occurs when a student is built up or strengthened spiritually. As a result of subsequent efforts to define and clarify *Edifying Teaching*, seven vital principles were identified as particularly important dimensions in bringing about *Edifying Teaching* (*Teaching the Gospel*, p. 2). The seven identified principles of edification consist of the following:

1. Recognize the Worth of a Soul (RWS)
2. Honor the Agency of Others (HAO)
3. Build Relationships of Trust (BRT)
4. Nurture Growth Through Participation (NGTP)
5. Expand Vision (EV)
6. Create Unity (CU)
7. Serve With an Eye Single to the Glory of God (SWES)

While the principles of edification correspond to the ETS functions, they are not defined as operational functions, or behaviors. Rather, they are identified in the form of principles which teaching functions should be based upon.

Although these principles of edification have been identified and inservice training has been conducted, these dimensions of edifying teaching have not yet become the basis for the evaluation of CES teachers.
In a recent study of Seminary teachers’ attitudes toward accountability in the religious education setting, Maughan (1994) found that the climate for revision of the CES evaluation system existed and proposed revision of the current accountability system. He asserted that the revision should be based upon the CES values, and the principles derived from them. He concluded that,

Teachers in the Church Educational System feel strongly that the philosophy, essentials and fundamental values of the church educational system if adhered to will accomplish the system's purposes (p. 105).

In discussing the tasks associated with adopting a new approach to teacher evaluation, Medley et al. (1984) commented,

The most difficult task that will face you . . . is probably the first . . . to define specifically and in detail what you mean by each dimension of teacher performance you propose to measure (p. 55).

They concluded by stating,

You cannot avoid this disagreeable task because you must provide the observer with a schedule or list of specific behaviors that he will be looking for and recording (p. 56).

As consideration was given to revising the current evaluation system, some proposed simply reclassifying the existing measurement instrument items by these identified principles of edification. Kelly (1927) suggested that this line of reasoning overlooks what he called the jingle fallacy, the fallacious idea that two tests that bear different names necessarily measure different traits (p. 64). Pursuant to further deliberation, it
became apparent that if these identified principles of edification were to be used as the basis for evaluation, a schedule or list of specific behaviors identified with each principle would be necessary (R. Cole, personal communication, February 1997).

Operational Definitions of the Principles of Edification

A recent study was conducted to facilitate a revision of the 1991 CES evaluation system which would be based upon the CES values, and the principles derived from them (Elzey, 1998). A section of the findings of the study provided operationalized definitions for each of the seven principles of edification and a potential evaluation instrument was prepared. As CES teachers and leaders were surveyed, they were asked to complete the following sentence for each of the seven principles of edification: “I can tell that teachers [demonstrate the given principle of edification] when they . . .” As the qualitative data were compiled, emergent themes were identified and listed in order of frequency. These emergent themes were intended to be used as operationalized definitions. Table 1 lists the statements used as operationalized definitions for each of the principles of edification.

These operationalized definitions form the basis for preparing evaluation items based upon the principles of edification. Although operationalized definitions are provided, among the emergent theme statements there is repetition, or overlap, between the principles of edification. For instance, surveyed individuals responded with issues relating to “student-focused teaching” as they defined both Recognize the Worth of a Soul and Nurture Growth Through Participation. “Student interaction” was identified with both Expand Vision and Create Unity.
Table 1

Operationalized Definitions of the Principles of Edification

<table>
<thead>
<tr>
<th>Operationalized Definition Statements</th>
<th>Frequency of Responses</th>
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<tbody>
<tr>
<td><strong>Recognize the Worth of a Soul</strong></td>
<td></td>
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<tr>
<td>1. have good student-teacher relations</td>
<td>24</td>
</tr>
<tr>
<td>2. greet students at the door and know their names</td>
<td>16</td>
</tr>
<tr>
<td>3. maintain student-focused teaching</td>
<td>10</td>
</tr>
<tr>
<td>4. follow-up on attendance, student progress, or discipline</td>
<td>4</td>
</tr>
<tr>
<td>5. attend students’ activities outside of class</td>
<td>4</td>
</tr>
<tr>
<td><strong>Honor the Agency of Others</strong></td>
<td></td>
</tr>
<tr>
<td>1. allow for student expression and leadership</td>
<td>11</td>
</tr>
<tr>
<td>2. focus on the choice/consequence relationship</td>
<td>8</td>
</tr>
<tr>
<td>3. allow opportunities to choose</td>
<td>8</td>
</tr>
<tr>
<td>4. teach correct principles and allow for self-governance</td>
<td>6</td>
</tr>
<tr>
<td>5. allow students to participate in leadership and class control</td>
<td>6</td>
</tr>
<tr>
<td><strong>Building Relationships of Trust</strong></td>
<td></td>
</tr>
<tr>
<td>1. show interest in students</td>
<td>12</td>
</tr>
<tr>
<td>2. are dependable with students, to policy, and to leaders</td>
<td>11</td>
</tr>
<tr>
<td>3. are sensitive of students’ feelings</td>
<td>7</td>
</tr>
<tr>
<td>4. keep confidences</td>
<td>6</td>
</tr>
<tr>
<td>5. extend confidence in students</td>
<td>4</td>
</tr>
</tbody>
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<tr>
<th>Operationalized Definition Statements</th>
<th>Frequency of Responses</th>
</tr>
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</table>

**Nurture Growth Through Participation**

1. enlist students in teaching and leadership 21  
2. use a variety of presentation methods 9  
3. allow for and positively reinforce student responses 9  
4. acknowledge the responsibility of the student in learning 7  
5. maintain student-focused teaching 3

**Expand Vision**

1. tie gospel learning into Heavenly Father’s Plan ("the big picture") 11  
2. assist students in finding meaning and application of the scriptures 6  
3. help students to examine scriptures with higher-order thinking skills (such as problem-solving, analysis, or synthesis) 6  
4. are committed to personal growth and change 4  
5. organize student interaction in class 3

**Create Unity**

1. encourage student interaction in class 14  
2. preserve a "safe" environment for students 10  
3. promote good faculty relations 8

(table continues)
Table 1 (continued)

<table>
<thead>
<tr>
<th>Operationalized Definition Statements</th>
<th>Frequency of Responses</th>
</tr>
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<tbody>
<tr>
<td><strong>Create Unity</strong></td>
<td></td>
</tr>
<tr>
<td>4. reach out to each student with love</td>
<td>5</td>
</tr>
<tr>
<td>5. are impartial with students</td>
<td>4</td>
</tr>
<tr>
<td><strong>Serve With An Eye Single to the Glory of God</strong></td>
<td></td>
</tr>
<tr>
<td>1. turn students’ attention away from teacher towards God</td>
<td>17</td>
</tr>
<tr>
<td>2. retain personal worthiness and integrity</td>
<td>9</td>
</tr>
<tr>
<td>3. have greater concern for students than for self-interests</td>
<td>8</td>
</tr>
<tr>
<td>4. are unselfishly committed to CES</td>
<td>7</td>
</tr>
<tr>
<td>5. teach with the Spirit</td>
<td>5</td>
</tr>
<tr>
<td>6. are submissive to leaders</td>
<td>3</td>
</tr>
</tbody>
</table>

Further overlap is seen where enlisting students in “leadership” was associated with both Honor the Agency of Others and Nurture Growth Through Participation. Individuals identified issues relating to “student-teacher relations” or “showing interest in students” with both Recognize the Worth of a Soul and Build Relationships of Trust.

These findings suggest that the seven constructs identified as the principles of edification either overlap conceptually or are interpreted differently by different respondents. Efforts were also made to consider the potential usefulness of former evaluation instrument response items. Findings showed that the majority of the former
CES evaluation items are also associated with multiple principles of edification. This further demonstrated that these principles overlap each other in mingled relationships.

**Evolving Concepts of Validity**

Perceptions of validity have evolved over the last number of decades. Angoff (1988) suggested that,

Conceptions of validity have changed several times in the last 35 years, but one conception, that validity itself is pre-eminent among the various psychometric concepts, remains constant. Validity has always been regarded as the most fundamental and important in psychometrics. It is therefore curious to note that serious work of clarifying the concept did not begin in earnest until the profession was 50 years old (p. 19).

As early as 1946, the ill-defined nature of validity was brought into question by Jenkins who wrote the paper, “Validity for what?” The notion of *predictive validity* was an early attempt at clarification. If a test is predictive, test scores are expected to maintain a high correlation with the future behavior the test is intended to predict. In the late 1940's, Flanagan (1948) discussed predictive validity in relation to the Air Force Aviation Psychology Program. The Air Force used a series of tests to predict the success of the training of bombardiers, navigators, and pilots.

Later, the concept of *concurrent validity* emerged as one type of predictive validity. With this type of predictive validity, two tests given concurrently which intend to measure the same trait are seen to be valid measures if the scores from the two tests are
highly correlated. Although not definitively confirming validity by itself, concurrent validity data assisted in replacing lengthier, costlier, or more prohibitive tests. If a test which is recognized as measuring some given trait correlates highly with a shorter, less expensive, or less prohibitive test, this other test may be used to replace the original.

In 1947, Mosier discussed in some detail the notion of face validity. This type of validity intends to confirm that a test appears valid to the test taker and to the public. The following issues are considered face validity issues: the use of appropriate, unambiguous language, the readability by the intended audience, or the visual simplicity of the test.

The concept of intrinsic validity emerged in the early 1950's. Gullisken (1950) described the process of intrinsic validation as follows:

1. theorizing the existence of similar (or dissimilar) traits,
2. theorizing the expected patterns of correlations,
3. measuring the several traits, and then,
4. examining the data for the expected correlational patterns.

Guilford (1946) began to classify types of validity. He identified two types of validity analogous to predictive and concurrent validities: factorial and practical. Similarly, Cronbach (1949) described two separate types of test validation: logical and empirical.

Construct Validity

In the early 1950's, Lee Cronbach served as the chairman of the American Psychological Association's committee to develop standards for educational and
psychological tests. Paul Meehl was a committee member. Following the committee’s deliberations, Cronbach and Meehl first introduced the term *construct validity* in the literature in 1955. They noted that,

Validation of psychological tests has not yet been adequately conceptualized, as the APA Committee on Psychological Tests learned when it undertook (1950-54) to specify what qualities should be investigated before a test should be published (p. 281).

Subsequently, four types of validity were distinguished and published in the *Technical Recommendations for Psychological Tests and Diagnostic Techniques*. At that time it was believed that each type of validity was established by different research and required different interpretations. The four identified types of validity included: predictive, concurrent, content, and construct validities. The chief innovation in the Committee’s report was the term *construct validity*. In reviewing this era of development, Cronbach (1989) reflected,

The committee requested preparation of an unofficial supplement to spell out the logic and methods of [construct validity] . . . Meehl developed the article with my help as committee chairman and generalist in testing . . . We were not radical innovators, but tellers of a tale already known in fragmentary form. (p. 149)

Cronbach (1971) expanded his definition of a construct by saying that, “A construct is an intellectual device by means of which one *construes* events. It is a means of organizing experience into categories” (p. 445). Gronlund and Linn (1990) later defined a construct as, “a psychological quality that we assume exists in order to explain some aspect of
behavior” (p. 66). They added that, “these are called constructs because they are theoretical constructions that are used to explain behavior” (p. 66-67). In defining this type of validation, the Technical Recommendations for Psychological Tests and Diagnostic Techniques stated, “construct validity is ordinarily studied when the tester has no definite criterion measure of the quality with which he is concerned, and must use indirect measures” (p. 14). Cronbach and Meehl (1955) stated,

*Construct validation* is involved whenever a test is to be interpreted as a measure of some attribute which is not “operationally defined.” The problem faced by the investigator is, “What constructs account for variance in test performance?” (p. 282).

Cronbach and Meehl (1955) went on to say that, “construct validity must be investigated whenever no criterion or universe of content is accepted as entirely adequate to define the quality to be measured” (p. 181).

Putting the conceptualization of construct validity into perspective, it has been said that,

It is arguable that social research methodology entered adolescence, if not maturity, in July 1955. This somewhat overlooked coming of age occurred with the publication of Cronbach and Meehl’s “Construct Validity in Psychological Tests” (Cherryholmes, 1988, p. 421)
Construct Validity As The Unifying Concept of Validity

In the 1966 and the 1970 editions of the APA *Standards for Educational and Psychological Tests*, the class of predictive validity was merged with that of concurrent validity. The new combined class was called criterion-related validity. This combination resulted in three types of validity described by the APA Standards. Guion (1980) described these three classes of validity as “a holy trinity representing three different roads to psychometric salvation” (p. 386). As the concepts of validity have continued to develop, the view that there are “three different roads” of validity has been modified. Messick (1980) stated,

[C]onstruct validity is indeed the unifying concept of validity that integrates criterion and content considerations into a common framework for testing rational hypotheses about theoretically relevant relationships (p. 1015).

Loevinger (1957) had stated much earlier, “since predictive, concurrent, and content validities are all essentially ad hoc, construct validity is the whole of validity from a scientific point of view” (p. 636). In essence, recent views have considered construct validity to comprise all validity. In this regard, Angoff (1988) stated,

[I]t may be said that the more recent view, in which construct validity comprises all validity, holds that these three types [of validity] are now to be regarded in a monotheistic mode as the three aspects of a unitary psychometric divinity (p. 25).

To further refine the notion of validity, Gronlund and Linn (1990) emphasized,

For convenience, the ways of accumulating evidence are usually grouped together in one of three categories (content, criterion related, and construct). Although
these categories help emphasize particular needs for evidence to support specific kinds of interpretations, they are interrelated and all contribute to an overall evaluation of the degree of validity (p. 50).

Cherryholmes (1988) summed up the practical significance of the unifying nature of construct validity, saying,

Construct validation is a pragmatic and socially critical activity because clear-cut distinctions among social research, social theory, and social practice cannot be sustained... [It] focuses attention where social theory and research converge and diverge at the juncture of words and things, concepts and objects, theory and practice—where theoretical constructs and research operations come together and separate. (pp. 421-422)

Thus, recent views emphasize the unifying nature of construct-related validity with content-related and criterion-related validities. Construct validation also unifies the aspects of social research, social theory, and social practice. Cronbach (1989) stated,

The conception of [construct validity] has evolved. [Construct validation] came in as an alternative style of validation—almost, as a last resort where analysis of content or predictive power could not support a validity claim. Today, [construct validity] is seen as the base on which the other approaches rest (p. 151).

Messick (1988) established the central place of construct validity in the unified view of validity when he said,

The heart of the unified view of validity is that appropriateness, meaningfulness, and usefulness of score-based inferences are inseparable and that the unifying force is
empirically grounded construct interpretation. Thus, from the perspective of validity as a unified concept, all educational and psychological measurement should be construct-referenced because construct interpretation undergirds all score-based inferences—not just those related to interpretive meaningfulness but also the content- and criterion-related inferences specific to applied decisions and actions based on test scores. As a consequence, although construct-related evidence may not be the whole of validity, there can be no validity without it (p. 35).

Construct Validity and Value Implications

Messick (1988) described the value implications of the overall evaluative judgement of the adequacy and appropriateness of inferences and actions based on test scores. He noted that such judgement “rests on four bases” (p. 42) derived from the crossing of the basis of judgement and the test function. He noted that,

Putting these four bases together, we see that test validity can be represented in terms of two interconnected facets linking the source of justification—either evidential or consequential—to the function or outcome of the testing, either interpretation or use. In a further development this notion, Messick (1992) later portrayed this unified view of test validity using the diagram in Figure 1.

When a test is used in a particular social context or applied setting, the respective value implications of consequential test interpretation emerge. For instance, when a test is used for different purposes, such as “selection, guidance, training, certification, or other social functions” (Messick, 1988, p. 42) the value implications for each of these
purposes may differ. With this reasoning, Messick further suggested that “validation should address values and consequences as well as utility and meaning” (p. 43).

<table>
<thead>
<tr>
<th>Evidential Basis</th>
<th>Test Interpretation</th>
<th>Test Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct Validity (CV)</td>
<td>Construct Validity (CV) + Relevance/Utility (R/U)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consequential Basis</th>
<th>Test Interpretation</th>
<th>Test Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct Validity (CV) + Value Implications</td>
<td>Construct Validity (CV) + Relevance/Utility (RU) + Social Consequences</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. A unified view of test validity

Ongoing Accumulations of Validity Evidence

Researchers and theorists currently consider validation efforts to be much more than a single validity check. One does not prove validity. Rather, validation is currently viewed as a lengthy, continuous process of ongoing accumulations of evidence. As crude theory sketches are defined, researchers attempt to find validity evidence from many sources. Campbell and Fiske (1959) introduced the multitrait-multimethod matrix approach to assist researchers in considering construct validity. Campbell and Fiske (1959) claimed that researchers should have more confidence in a theorized construct when (a) more ways to measure it are devised, and (b) more distinction from other constructs is confirmed. Cronbach (1989) discussed the notion that as ongoing construct validity evidence is accumulated, candidate constructs may become established constructs,
where “these interim understandings are the crude ore the scientific method intends to turn into gold” (p. 159). In this hypothesis-dominated research, “Confirming evidence should not count except when it . . . can be presented as a serious but unsuccessful attempt to falsify the theory” (Popper, 1962, p. 36). Thus, any given study (including this research) is a necessary step in the analysis of the crude ore theory sketch in construct validation, but should not be viewed as sufficient to confirm a pure gold construct. For any given construct, the ongoing sequence of research operations yields results which give greater clarity to the once crude theory sketch. Likewise, instruments intended to measure the given construct are refined in this iterative process.

Validation of Testing

Another new perception has emerged in regards to validity. Formerly, validity was primarily focused on the tests. In the more recent view, “not only . . . the test is at issue but . . . the rest of the testing situation is also at issue” (Angoff, 1988, p. 24). It is interesting to note that the earlier (1954, 1966, 1974) standards for educational and psychological tests were titled, Standards for Educational and Psychological Tests with the 1985 standards being titled, Standards for Educational and Psychological Testing. (emphasis added) In this regard, Gronlund and Linn (1990) stated,

Validity refers to the appropriateness of the interpretations made from test scores and other evaluation results, with regard to particular use . . . validity is always concerned with the specific use of the results and the soundness of our proposed interpretations (p. 47).
In other words, rather than simply verifying the measuring instrument, the validation also includes the verification of the theory of the construct which the instrument is intended to measure. Gronlund and Linn (1990) described construct validation as simply, "determining the extent to which test performance can be interpreted in terms of one or more psychological constructs" (p. 67). Angoff (1988) summarized by saying, More accurately, [construct validation] reflects a verification of the inferences and interpretations to be drawn from the test scores and a corresponding modification (if so indicated) of the instrument and/or the theory underlying the construct (p. 29).

Messick (1988) defines validity, in general, as "an overall evaluative judgement, founded on empirical evidence and theoretical rationales, of the adequacy and appropriateness of the inferences and actions based on test scores" (p. 33).

Statement of the Problem

With no definite empirical criterion measure of the dimensions represented by the principles of edification, indirect measures must be employed. Indirect measures of these principles might include such things as the following: administrative evaluation, teacher self-evaluation, peer evaluation and student evaluation. Although operationalized definitions are provided for instrument items by a recent study (Elzey, 1998), the findings of overlapping relationships narrow the valid interpretation of scores. Evaluation items are most useful when univocal. When instrument items maintain a high level of overlap, the valid interpretation of their scores is narrowed to a composite score rather than scores
for each factor. Instruments with this feature leave the researcher questioning which constructs account for variance in scale scores. Simply stated, researchers are unable to interpret the scores of such indirect measures in terms of teaching dimensions, or constructs.

**Statement of the Purpose**

The primary purpose of this study was to examine the construct validity of the teaching dimensions identified as the principles of edification. These dimensions are postulated as measures of *edifying teaching* among Seminary teachers in the LDS Church Educational System. The instrument proposed to measure these dimensions provides seven subscales with a number of items associated with each of the seven principles of edification. In this study, efforts were made to consider the degree to which the response patterns to this instrument cluster into the seven postulated factors. In addition, the proportion of the total variance accounted for by these factors were examined. As a secondary purpose, the gathered data were examined to consider an alternative set of factors that might be represented. Specifically, while not constraining the analysis to seven factors, the number of dimensions (or factors) along which students evaluate the level of *edifying teaching* among their seminary teachers were considered. Similar analysis regarding variance were conducted on this alternative set of identified factors.
Research Questions

Considering these purposes, the following research questions were considered in this research study:

1. To what extent do the results of the factor analysis confirm the postulated seven-factor structure?
   a. To what degree are the identified factors correlated with each other?
   b. What proportion of the total variance is explained by the aggregate of the identified factors.
   c. What proportion of the total variance is explained by each of the identified factors?

2. If not constrained to seven factors, how many dimensions (or factors) are there along which students evaluate the level of *edifying teaching* among their seminary teachers?
   a. To what degree are the unconstrained set of factors correlated with each other?
   b. What proportion of the total variance is explained by the aggregate of this unconstrained set of factors?
   c. What proportion of the total variance is explained by each of the factors in this unconstrained set?
CHAPTER 3

Method

As teacher evaluation is conducted in CES, there is a rather large set of possible variables or dimensions to consider. It is helpful to inquire about how many different underlying factors or dimensions are represented by any gathered data. Efforts were made to consider whether the seven identified principles of edification represent a parsimonious set of variables that accounts for a major percentage of the variation in the students' responses.

Data Collection and Analysis

A 40-item instrument was prepared which theoretically measures and discriminates between the seven dimensions identified as the principles of edification. Each of these dimensions of edifying teaching has a subscale represented by between four and seven items on the instrument. Data analysis was conducted in two phases: initial item analysis followed by factor analysis.

Using the current version of this instrument, a sample of seminary students was surveyed and the response data were analyzed. Each item was correlated with its own subscale total, as well with the total of the other six subscales.

The scales were revised based upon the results of the item analysis. Then the revised survey was administered to another sample of students. To test the theory underlying this instrument, multivariate statistical analysis was then employed. Two types of factor analysis were conducted—specifically, confirmatory factor analysis (Bryant & Yarnold,
1995, pp. 106-108) and exploratory factor analysis (Bryant & Yarnold, 1995, pp. 108-121). The purpose of this more thorough factor analysis was to (a) determine the number of dimensions along which students evaluate the effectiveness of their seminary teacher, (b) determine how these various dimensions interrelate with each other, and (c) interpret the meaning of the identified dimensions. In confirmatory factor analysis, the factor model was specified according to the theorized relationships. Conversely, exploratory factor analysis was used to identify other possible factor models. Confirmatory factor analysis was initially employed to test the original seven-factor hypothesis which is based upon the seven identified principles of edification. Next, modifications to the original seven-factor hypothesis structure were considered after relaxing various constraints. Exploratory factor analysis was then employed to consider other factor hypotheses that the data might better represent. As alternative hypotheses were considered, new combinations of variables were subjectively analyzed to give meaning to the newly identified factor structure. In factor analysis, the statistical data (measurements) are explored by transforming the data into linear combinations of the independent variables. The analysis was conducted on the correlation matrix of the observed variables with the “factor” being a weighted average of the original variables.

Gronlund and Linn describe the process of construct validation as including the following steps:

1. Identify and describe (by theoretical framework), the meaning of the construct(s) to be measured.
2. Derive hypothesis regarding test performance from the theory underlying the construct.

3. Verify the hypothesis by logical and empirical means.

To answer the first listed step above, the theorized factor model for the constructs relating to the seven principles of edification can be stated as follows: the seven principles of edification are distinct dimensions which bring about edifying, or spiritually building, teaching. The hypothesized test performance is as follows: instrument items associated with each of the seven principles of edification will correlate more highly within subscales than with the items in the other six subscales. In other words, the responses to the test items will identifiably cluster according to each of the seven principles of edification.

Confirmatory factor analysis was used to confirm or disconfirm the hypothesized factor structure. This type of factor analysis was used to determine whether the items were highly loaded on the scale they were intended to measure. Those with less of a load were eliminated to allow for more appropriate interpretation of scores. In this sense, the theorized dimensions of teaching identified as the principles of edification were examined. Items which appeared to be good indicators of these constructs were retained, while the remainder were eliminated. Korth (1975) described the difference between principal component analysis (often confused with factor analysis) and factor analysis by saying,
In component analysis, generally, the observed scores are assumed to have undergone some lengthy investigation, so that the measures themselves are considered precise, accurate, or reliable indications of some construct . . .

In factor analysis, the scores may or may not be so well regarded. Some of them may be considered good indications of a construct, but others may be initial attempts at developing a measure for a construct . . . In rather exaggerated terms, components analysis looks forward to a simplification of a relatively well-worked-out system, while factor analysis looks backward to attempt to find such a system by analyzing the latent components (p. 131).

Confirmatory factor analysis attempts to interpret the data according to seven factors assumed to represent the seven identified principles of edification. On the contrary, in exploratory factor analysis, the researcher attempts to identify the number of possible factors represented in the data by computing eigenvectors derived from a correlation matrix. Eigenvectors and eigenvalues were calculated using communalities. Kaiser proposed a commonly used stopping rule in which all factors with eigenvalues greater than 1.0 are retained (Kaiser, 1965). This stopping rule was used in this study. In this manner, the correlation matrix was broken down into each of the identifiable dimensions or sources of influence. Initially, the correlation matrix was adjusted with communalities. This adjusted correlation matrix was subjected to principal components analysis (hence, the confusion mentioned earlier), followed by the development of a new correlation matrix which was based upon the new communalities derived from the analysis. This process was iterated until only insignificant changes occurred in the new
communalities. The resulting information allowed for the identification of the number of dimensions in the data set along which students evaluate the level of *edifying teaching* among their seminary teachers.

**Instruments**

Student evaluations of their seminary teachers were conducted using the proposed survey from the study Elzey (1998) conducted (see Appendix A). After considering initial findings, modifications were then made to the survey and this second survey was used.

**Subjects**

There were approximately 1,460 full-time CES Seminary teachers in US/Canada considered in the study. The majority of this group were released-time teachers or administrators, with a smaller group serving as Coordinators who supervise volunteer teachers and sometimes also teach classes themselves. This study focused on the released-time population. Released-time teachers have approximately 20-175 students, with most having an average of 150. These US/Canada released-time seminary students were the subjects who provided the information gathered for this study.

**Sampling**

In current multivariate statistical analysis sampling practices, for the results of one’s analysis to be reliable, researchers rely on a rule of thumb called the subjects-to-variable
(STV) ratio. Most researchers suggest that the STV ratio should be five or greater.

Bryant and Yarnold (1995) explained,

For the results of one’s analysis to be reliable, that is, for the results to replicate if the analysis is repeated using an independent sample, the minimum number of (randomly selected) observations in one’s sample should be at least five times the number of variables: The STV ratio should be 5 or greater.

Therefore, with the first survey having 40 items or variables of interest, a sample of 200 or more students was needed for reliable data. Fifteen randomly selected teachers were instructed to administer the student evaluation to one of their randomly selected classes to allow for the initial item analysis. Using the conclusions generated from the item analysis, modifications were then made to the instrument. Secondly, fifteen different randomly selected teachers were instructed to administer the modified student evaluation instrument to one of their randomly selected classes to allow for the two types of factor analysis.
CHAPTER 4

Findings

Item Analysis

In an effort to analyze the items of the original 40-item survey (see Appendix A) for discriminating power, an item analysis was conducted. One consideration in evaluating an item’s discriminating power is to examine its correlation to all of the items within its hypothesized factor. A random set of 297 students from among 12 of the 15 randomly selected teachers responded to the 40-item survey. Three teachers did not respond. As the data were analyzed, item-to-total correlation coefficients were calculated. Generally, an item has marginally acceptable item-to-total correlation if between .50 and .60, while a greater correlation is acceptable. For this study, it was determined that any item which had an item-to-total correlation of .50 or lower would be deleted from the instrument. Likewise, it was determined that where a correlation was in the marginally acceptable range, that item would be considered for deletion. Table 2 shows the item-to-total correlations for each item associated with the seven hypothesized factors.

There were no item-to-total correlations of .50 or lower which would lead to deletion solely upon this criterion. Additionally, only two items (13 and 19 in RWS) were found to have correlations less than .60. The majority of the items were found to be much more highly correlated with their subscale total.

While examining the relationship of an item to the other items within its own hypothesized factor is important, it is not sufficient. Another important consideration involves the item’s relationship to the other factors. If an item is highly correlated with its own factor but is also highly correlated with other factors, it has low discriminating power. Table 3 shows the six items which were found to have unacceptably high item-
to-total correlations with other factors. Therefore, the six items listed in Table 3 were deleted from the 40-item survey to create a 34-item survey (see Appendix B).

Table 2

<table>
<thead>
<tr>
<th>Item-to-total Correlations For Original 40-item Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors</td>
</tr>
<tr>
<td>RWS</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1 = .73</td>
</tr>
<tr>
<td>13 = .58</td>
</tr>
<tr>
<td>15 = .68</td>
</tr>
<tr>
<td>19 = .58</td>
</tr>
<tr>
<td>25 = .73</td>
</tr>
<tr>
<td>39 = .76</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Items With High Inter-factor Correlations For Original 40-item Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Number</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>25</td>
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<tr>
<td>39</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
It was noted earlier that several items maintain only marginally acceptable item-to-total correlation with their hypothesized factor. An examination of their correlations with the other factors is shown on Table 4.

Table 4

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item-to-total Correlation With the Hypothesized Factor</th>
<th>Next Highest Item-to-total Correlation With Other Factor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>.58 (RWS)</td>
<td>.41 (BRT)</td>
</tr>
<tr>
<td>19</td>
<td>.58 (RWS)</td>
<td>.46 (EV)</td>
</tr>
</tbody>
</table>

While these items show only marginally acceptable levels of correlation with their hypothesized factors, they are distinguishably more highly correlated with this factor than any other factor. Therefore, they were retained in the instrument. Gender, which is item 41 on the survey, was not considered in the item analysis. Thus, there are 34 variables of interest on the prepared survey.

Confirmatory Factor Analysis

The 34-item survey was responded to by 276 randomly selected students from among 12 of the 15 randomly selected teachers. Three teachers did not respond. Confirmatory factor analysis was then employed to determine how well the data represent the hypothesized factor structure. One alternative in confirmatory factor analysis is to examine the factor structure using the linear equations which the hypothesis
represents. Structural equation modeling using Calis (Covariance Analysis of Linear Structural Equations) estimates parameters and tests the appropriateness of linear structural equation models. (See Appendix C for a glossary of statistical terms referred to in the findings.)

Seven-Factor Hypothesis

The seven-factor hypothesis based upon the seven principles of edification was used to define the linear structural relationships. Factor model specifications included the expected linear structural relationships, the expected factor variances and covariances, and any expected unique errors in the measured variables (see Appendix D). A goodness-of-fit index and root mean squared residual were calculated to determine how well the data fit into the linear structural relationships implied by the hypothesis. The goodness-of-fit index was found to be .78 and the root mean squared residual was found to be .05. Generally, a goodness of fit index of .80 is the minimally acceptable level, with .90 as better, and .95 as quite good. Therefore, this procedure provides evidence that the unmodified seven-factor hypothesis is poorly represented in the collected data.

Modifications which relax the constraints on unique error terms or single factor loadings would likely adjust the goodness-of-fit index up to a minimally acceptable level but inter-factor correlations must be considered first. The inter-factor correlations for the seven factors range from .90 to 1.0. Therefore, although seven separate factors are identified using Calis, they are so highly correlated that they do not serve to discriminate.
The seven factors identified in Calis are not interpretable. Conceptually speaking, Calis arrived at a rotation that allowed for seven separate vectors to be identified but the vectors are so closely parallel that they are indistinguishable beyond one overall vector. The evidence from this confirmatory factor analysis suggests that the originally hypothesized seven-factor structure does not allow for an adequate level of discriminating power. Therefore, other potential factor structures represented in the data were explored.

**Exploratory Factor Analysis**

Exploratory factor analysis can be used to determine the optimum number of factors that might be extracted from (or represented by) a set of data. One can define the hypothesized number of factors to explore or can use the optimum number of factors determined by a stopping rule.

**Principal Factor Analysis**

Principal Factor Analysis is the simplest and computationally most efficient method of factor analysis. In Principal Factor Analysis, squared multiple correlations are used for the prior communality estimates. For this study, Principal Factor Analysis was used as follows: (a) eigenvalues of the correlation matrix were derived, (b) the optimum number of factors to extract using Kaiser's stopping rule was determined, and (c) a scree plot of eigenvalues was constructed.
Table 5 shows the eigenvalues of the reduced correlation matrix for the first seven factors and the percent of total variance the factor accounts for.

Table 5

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>Percent of Variance Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>15.58</td>
<td>79.6</td>
</tr>
<tr>
<td>II</td>
<td>1.12</td>
<td>5.7</td>
</tr>
<tr>
<td>III</td>
<td>.76</td>
<td>3.9</td>
</tr>
<tr>
<td>IV</td>
<td>.68</td>
<td>3.5</td>
</tr>
<tr>
<td>V</td>
<td>.54</td>
<td>2.8</td>
</tr>
<tr>
<td>VI</td>
<td>.48</td>
<td>2.4</td>
</tr>
<tr>
<td>VII</td>
<td>.41</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Figure 2 shows the scree plot of all 34 eigenvalues using Principal Factor Analysis. Two factors occur above the line drawn through the “scree” of the remaining 32 items’ eigenvalues. The second factor is barely above the line.

Kaiser’s stopping rule suggests that factors with associated eigenvalues of 1.0 or greater should be retained. Therefore, using this stopping rule to determine the optimum number of vectors to explore, two vectors (factors) should be extracted. With this in mind, notice in the previous scree plot (Figure 2) that Factor I begins the vertical slope, Factor II ends the slope and Factor III begin the “scree” or rubble at the base of the slope. All of the other factors are encompassed in the “scree” or rubble.
The two extracted factors account for 85% of the total variance in teacher's ratings as provided by students.

![Scree plot of eigenvalues](image)

**Figure 2.** Scree plot of eigenvalues

Although the hypothesized seven-factor structure was found to be inadequate, prudent reasoning suggests that other possible seven-factor structures should first be explored before resorting to an exploration of only two extracted factors as determined by the stopping rule.

**Varimax Rotation**

Varimax, which is the most popular orthogonal rotation method, may be used in an attempt to achieve simple structure by forcing factors to be uncorrelated. As this rotation method was used to explore the acquired data, being constrained to seven uncorrelated
factors, the pattern is found to be “noisy” (see Appendix E). While seven factors are identifiable, the number of variables in each factor’s subscale is limited. For the purpose of this study, it was determined that only those items which have a loading of .40 or greater would be considered satisfactory variables in a subscale for any factor. Additionally, items need to be relatively independent. Therefore, it was determined that the item must load on the associated factor at a minimum level of .10 larger than its’ loading on any other factor. With these criteria, only two factors were found to have more than two items in their subscales. Given the mentioned criteria, one factor does not have any variables which independently load on it, and another factor has only one loading variable.

Finally, of the 34 items of interest on the survey, only three loaded at an acceptable level on the factor they were hypothesized to represent (see Appendix F).

**Procrustes Rotation**

Procrustes is an oblique rotation method used in an attempt to achieve simple structure while allowing factors to be correlated. In order to explore the hypothesized relationships, a target matrix is defined accordingly. When defined to include seven factors, the pattern shows little possibility for a valid structure (see Appendix G). Four factors have no variables which load to an acceptable level according to the previously mentioned criteria. As seen in Table 6, while RWS has a variable that loads at an acceptable level, the variance explained by this factor is still quite low. NGTP and EV factors have more promising variance levels.
Table 6

Variance Explained By Each Factor Ignoring Other Factors In The Procrustes Rotation

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percent of Variance Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Recognize the Worth of A Soul (RWS)</td>
<td>2.61</td>
</tr>
<tr>
<td>II Honor the Agency of Others (HAO)</td>
<td>3.94</td>
</tr>
<tr>
<td>III Build Relationships of Trust (BRT)</td>
<td>5.19</td>
</tr>
<tr>
<td>IV Nurture Growth Through Participation (NGTP)</td>
<td>7.31</td>
</tr>
<tr>
<td>V Expand Vision (EV)</td>
<td>11.20</td>
</tr>
<tr>
<td>VI Create Unity (CU)</td>
<td>4.08</td>
</tr>
<tr>
<td>VII Serve With An Eye Single to the Glory of God (SWES)</td>
<td>9.59</td>
</tr>
</tbody>
</table>

Although SWES has a promising variance level, Table 7 shows that it is so highly inter-factor correlated that it becomes a weak discriminator. These findings suggest that the Procrustes rotation is unable to identify an alternative satisfactory seven-factor structure. While Procrustes was unsuccessful in identifying an alternative seven-factor structure, another oblique rotation method which relaxes the constraint on each of the factors being uncorrelated may be should be explored before resorting to the exploration of the two extracted factors as determined by Kaiser’s stopping rule.
Table 7

Inter-Factor Correlations in the Procrustes Rotation

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>RWS</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>HAO</td>
<td>0</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>BRT</td>
<td>4</td>
<td>-5</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>NGTP</td>
<td>10</td>
<td>46</td>
<td>36</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>EV</td>
<td>24</td>
<td>59</td>
<td>34</td>
<td>57</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>CU</td>
<td>16</td>
<td>-38</td>
<td>26</td>
<td>5</td>
<td>21</td>
<td>100</td>
</tr>
<tr>
<td>VII</td>
<td>SWES</td>
<td>44</td>
<td>3</td>
<td>36</td>
<td>31</td>
<td>48</td>
<td>67</td>
</tr>
</tbody>
</table>

Promax Rotation

Promax is another oblique rotation method used in an attempt to achieve simple structure by relaxing the constraint on factors being uncorrelated. In contrast to Procrustes rotation, Promax is not defined by a hypothesized structure. Several Promax rotations may be employed to consider the factor loadings. Even when the least restrictive Promax rotation method is employed for the data, the seven-factor pattern is still quite poor (see Appendix H). Similar to the varimax findings, only two factors have a satisfactory number of variables in their subscales. Three factors are shown to have only two items in their respective subscales, and the remaining two factors have only one variable which meet the previously mentioned criteria.
With these evidences that a seven-factor structure is poorly represented in the data, an exploration of the two-factor structure determined by Kaiser's stopping rule is appropriate.

**Two-factor Promax Rotation**

When the number of factors is not constrained to seven, the oblique promax rotation achieves a very promising simple structure from the data (see Appendix I). In the previous exploratory factor analyses, the minimum loading criteria for considering an item have been as follows: a minimum loading of at least .40 on the factor of interest and at least .10 greater than it's loading on the other factors. Using these criteria, 31 of the 34 variables of interest load at this minimally acceptable level. Analysis of this large set did not provide any interpretable pattern to deduce meaning. Nonetheless, an analysis which began with the items having the highest loadings among the two factors did provide interpretable meaning. If these criteria are raised to a more conservative level where the loading is at least .55 on the factor of interest and at least .30 greater than on the other factor, 19 variables are retained. Factor I retains 13 items and Factor II retains the remaining six items. Tables 8 and 9 show the two sets of items and their associated statements from the 34-item survey. Items with highest loadings are listed first.

In order to find meaning behind the segregation of the two factors, a subjective interpretation was made. Such an analysis gave evidence that items loading on Factor I predominantly relate to teacher-student relations. Eleven of the thirteen items mention some aspect of teacher-student interaction. Notice that ten of these items mention
students directly and the eleventh speaks of relationships. The other two items relate to a teacher’s character.

Table 8

Factor I Items and Their Associated Survey Statements

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Survey Statement</th>
<th>Loading On Factor I</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>My teacher honors the agency of others.</td>
<td>.84</td>
</tr>
<tr>
<td>26</td>
<td>My teacher seems unselfishly committed to the seminary program.</td>
<td>.77</td>
</tr>
<tr>
<td>28</td>
<td>My teacher shows love for each student.</td>
<td>.74</td>
</tr>
<tr>
<td>25</td>
<td>My teacher doesn’t play favorites with students.</td>
<td>.71</td>
</tr>
<tr>
<td>9</td>
<td>My teacher teaches what is right and allows students to govern themselves.</td>
<td>.66</td>
</tr>
<tr>
<td>29</td>
<td>My teacher seems worthy and full of integrity.</td>
<td>.66</td>
</tr>
<tr>
<td>34</td>
<td>My teacher is sensitive to student’s feelings.</td>
<td>.66</td>
</tr>
<tr>
<td>3</td>
<td>My teacher builds relationships of trust.</td>
<td>.64</td>
</tr>
<tr>
<td>19</td>
<td>My teacher helps to preserve a “safe” environment for students.</td>
<td>.61</td>
</tr>
<tr>
<td>1</td>
<td>My teacher gets along well with the students.</td>
<td>.57</td>
</tr>
<tr>
<td>22</td>
<td>My teacher extends confidence in students.</td>
<td>.56</td>
</tr>
<tr>
<td>23</td>
<td>My teacher allows students to express things and respects their opinions.</td>
<td>.56</td>
</tr>
<tr>
<td>27</td>
<td>My teacher allows students opportunities to choose.</td>
<td>.55</td>
</tr>
</tbody>
</table>
Table 9

Factor II Items and Their Associated Survey Statements

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Survey Statement</th>
<th>Loading On Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>My teacher uses a variety of presentation methods.</td>
<td>.84</td>
</tr>
<tr>
<td>17</td>
<td>My teacher helps students to examine the scriptures in a way that helps them really think.</td>
<td>.67</td>
</tr>
<tr>
<td>15</td>
<td>My teacher ties the learning in class into the plan of Heavenly Father.</td>
<td>.57</td>
</tr>
<tr>
<td>2</td>
<td>My teacher nurtures students growth by inviting participation.</td>
<td>.57</td>
</tr>
<tr>
<td>12</td>
<td>My teacher attends students activities outside of class.</td>
<td>.56</td>
</tr>
<tr>
<td>8</td>
<td>My teacher turns student’s attention to God, rather than to themselves.</td>
<td>.56</td>
</tr>
</tbody>
</table>

The items loading on Factor II predominantly relate to a teacher’s manner of presentation. Simplifying, there is evidence that when students evaluate their seminary teachers they discriminate upon the dimensions of teacher-student relations and the teacher’s presentation manner or skill. The correlation between Teacher-student Relations and Teacher Presentation is .68. This correlation suggests that these two factors are positively correlated to a high degree. In other words, teachers who were
rated high on *Teacher-student Relations* tend to be rated high on *Teacher Presentation* and vice-versa. Another interesting analysis includes examining the clustering of items in relation to the postulated seven-factor pattern. Table 10 shows the combinations of items for the two extracted factors in relation to the original subscales for the principles of edification.

**Table 10**

**Factor I and Factor II Items Relative to the Principle of Edification Subscales**

<table>
<thead>
<tr>
<th>Principle of Edification</th>
<th>Factor I</th>
<th>Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognize the Worth of a Soul (RWS)</td>
<td>1 item</td>
<td>1 item</td>
</tr>
<tr>
<td>Honor the Agency of Others (HAO)</td>
<td>3 items</td>
<td>0 items</td>
</tr>
<tr>
<td>Build Relationships of Trust (BRT)</td>
<td>3 items</td>
<td>0 items</td>
</tr>
<tr>
<td>Nurture Growth through Participation (NGTP)</td>
<td>0 items</td>
<td>2 items</td>
</tr>
<tr>
<td>Expand Vision (EV)</td>
<td>0 items</td>
<td>2 items</td>
</tr>
<tr>
<td>Create Unity (CU)</td>
<td>3 items</td>
<td>0 items</td>
</tr>
<tr>
<td>Serve With An Eye Single to the Glory of God</td>
<td>3 items</td>
<td>1 item</td>
</tr>
</tbody>
</table>

A schematic diagram of the relationship between the hypothesized factor structure and the two-factor structure is displayed in Figure 3. Numbers in the diagram represent the item or variable from the 34-item instrument.

The variance explained by each of the two extracted factors ignoring other factors is 93% for Factor I with the remaining 7% accounted for by Factor II. In other words, the
primary dimension upon which students evaluated their seminary teacher using the
provided instrument was teacher-student relations.

**Hypothesized Seven-factor Structure**

- Honor the Agency of Others (HAO)
  - 5, 9, 23, 27, 32

- Build Relationships of Trust (BRT)
  - 3, 10, 22, 34

- Create Unity (CU)
  - 13, 19, 25, 28, 30

- Serve With An Eye Single to the Glory of God (SWES)
  - 4, 8, 16, 21, 26, 29, 33

- Recognize the Worth of A Soul (RWS)
  - 1, 12, 14, 18

- Nurture Growth through Participation (NGTP)
  - 2, 6, 11, 20

- Expand Vision (EV)
  - 7, 15, 17, 24, 31

**Extracted Two-factor Structure**

- Teacher-Student Relations
  - 5, 9, 27 (HAO)
  - 3, 22, 34 (BRT)
  - 19, 25, 28 (CU)
  - 23, 26, 29 (SWES)
  - 1 (RWS)

- Teacher Presentation
  - 8 (SWES)
  - 12 (RWS)
  - 2, 6 (NGTP)
  - 15, 17 (EV)

**Figure 3.** Schematic diagram of the relationship between the postulated seven-factor and
the extracted two-factor items
CHAPTER 5
Discussion and Conclusions

Conclusions

As religious educators in the LDS Church Educational System have pursued the task of teaching to edify (or to build students spiritually), a defensible teacher evaluation system has been difficult to design and implement. Many attempts have been made, each facing its unique challenges.

The most recent evaluation system in CES was published in 1991, the CES Employee Evaluation Handbook. The evaluation system includes 12 separate instruments. This set of instruments is intended to provide a means for collecting data regarding teachers from three sources: administrators, students, and the teachers themselves. Although a thorough study confirmed the reliability (the consistency of evaluation measures) of these instruments (Lunt, 1995), the same study concluded that there were unsettled feelings among CES employees regarding the use of these instruments as tools for measuring and improving teacher and administrator performance.

The implemented 1991 CES teacher evaluation system has generally been met with resistance by teachers and administrators of the Church Educational System (R. Cole, personal communication, February 1997; Howell, 1995; Maughan, 1994; C. Schramm, personal communication, February 1997). Many of the identified areas of concern relate to the appropriateness, meaningfulness, and usefulness of score-based inferences produced by the use of such instruments. Previously, there has been little consensus
regarding the appropriate dimensions to be measured in such an evaluation. Despite several administrative and scholarly attempts, there has been an absence of an accepted set of dimensions for such measurement.

In an effort to specify the desirable attributes and practices of religious educators, CES administrators have defined six values and seven principles of edification which they believe are governing principles in effective religious education. One of the six CES values is Edifying Teaching. The seven principles of edification are believed to be important in fostering teaching that edifies. Although CES has systematically trained full-time employees on the values and principles of edification, they are not yet the basis for teacher evaluation. When surveyed, almost all (98%) CES teachers and leaders reported they believed that the identified principles of edification govern their teaching. By contrast, ironically, more than 70% feel that they think of the principles of edification only occasionally or rarely in their teaching (Elzey, 1998).

One of inhibitor to incorporating the CES values and principles of edification in an evaluation system has been the lack of clear definitions of how each of them operates in practical applications. In a recent study, operationalized definitions for each of the seven principles of edification were generated and a proposed evaluation instrument was prepared (Elzey, 1998). The study concluded that the principles of edification maintain a high degree of inter-factor correlation. Evaluation instruments are most useful when the separate dimensions or factors they measure are univocal. Simplistically, when instrument items representing separate factors are highly correlated, the valid interpretation of their scores is narrowed to a composite score rather than scores for each
factor. In other words, it is not useful to attempt to interpret a profile of such highly correlated scores.

This study explores the dimensions upon which students evaluate their seminary teachers and the potential viability of using the principles of edification as measures. Findings give evidence that while students may conceptually understand the principles of edification, they are unable to apply them to an evaluation of their teacher. Further orientation or training of students on the use of the seven principles of edification may, or may not, allow for valid use of such ratings but without such training, students do not discriminate upon these dimensions.

Confirmatory factor analysis shows that the hypothesized seven-factor structure based upon the principles of edification is not represented in the data. Furthermore, an alternative seven-factor structure is not found to be viable either. While seven factors can be segregated out from the data, these factors are so highly correlated that they become weak indicators. Conceptually, they act as one larger factor.

Using exploratory factor analysis, there is evidence that students do discriminate among two factors or dimensions in evaluating their seminary teacher. When subjectively analyzing the sets of variables represented in these two factors, there is evidence that students discriminate upon such dimensions as Teacher-student Relations and the teacher's general Teacher Presentation manner or skill. Intuitively, these distinct dimensions represent two important aspects in all learning: relationships and activities, rapport and pedagogy. It is important to note that the first of these two dimensions, teacher-student relations, accounts for 93% of the variance in this two-factor model.
In summary, the originally postulated seven-factor structure based upon the principles of edification was not found to have construct validity as a measure of edifying teaching by seminary students. Rather, students provide ratings for their teachers based upon a smaller set of dimensions. There is evidence that these dimensions relate to teacher-student relations and the teacher's general presentation manner or skill, with teacher-student relations accounting for almost all of the variance in ratings.

Recommendations For Future Research

As noted earlier, construct validation requires an ongoing accumulation of evidence. In this regard, further research relating to construct validity issues might focus on the following questions:

1. How should an instrument which incorporates the 19 items associated with the two extracted factors be further refined to ensure that the items have a higher item discrimination index?

2. Where does this 19-item instrument fit in relation to a comprehensive evaluation system to provide teacher evaluation across a full profile in CES?

3. Rather than students, can teachers or administrators use evaluation instruments based upon the principles of edification as valid measures?

4. In complementing an evaluation of Edifying Teaching based upon the principles of edification, how might the other five identified CES values be incorporated into a comprehensive evaluation system?
5. How might CES better assure the appropriate use of student ratings of teachers utilized for different purposes, such as teacher selection, guidance, training, certification, or otherwise?

6. How might findings differ regarding the validity of the principles of edification as measures of edifying teaching by students if using a different set of operationalized definitions?

7. How able are Seminary students in providing accurate information for evaluating their teacher?

**Recommendations for CES Policy and Practice Considerations**

The findings of this study have significant implications for CES policies and practices relating to teacher evaluation. First, it is important to affirm that this study has in no way invalidated the significance of the principles of edification as being important in bringing about teaching that edifies. These principles are surely significant aspects which should govern a religious educator’s teaching and leadership. Their application in teacher evaluation may yet serve CES. Further research regarding the valid use of the principles of edification in evaluation ratings provided by teachers or administrators is necessary.

However, the findings of this study affirm that the use of the principles of edification as a means for students to evaluate their seminary teachers has questionable validity. Students demonstrated that they did not make independent judgements for each of the seven dimensions associated with the principles of edification when evaluating their teachers. Any currently prepared instruments purporting to use the principles of
edification for student-provided ratings of their teacher should be studied for validity. While such instruments may maintain test-retest reliability, the use of these ratings as a basis for making inferences about the degree to which individual teachers successfully use the principles of edification in their teaching should be discouraged. Further research should be conducted regarding the two identified constructs which, in this study, students are found able to discriminate. Particular attention should be given to the construct associated with teacher-student relations.

Among other things, validity has to do with the *accuracy, appropriateness*, and *comprehensiveness* of evaluative measurements and their use. Considering comprehensiveness, it is important to note that CES has defined religious education as requiring three fundamental aspects: (a) the influence of the Spirit, (b) the teaching of saving principles, and (c) appropriate consideration of the principles of edification (*Teaching the Gospel*, p. 2). While this study has focused on the third of these fundamental aspects by considering the CES value of *Edifying Teaching*, there are surely other domains which need to be considered in a full teacher evaluation system. Therefore, evaluation which measures the other two aspects should be researched as well.

Wherein a measured evaluation of the influence of the Spirit in a CES classroom experience is surely subject to serious difficulties, it may well be one of the overriding factors which students consider in providing ratings of their teachers. One possibility for incorporating aspects of the influence of the Spirit in teacher evaluation is in self-assessment. Further efforts in preparing teacher self-assessment instruments might more appropriately address the influence of the Spirit by allowing for self-reflection. Such self
assessment might be helpful as a basis for formative evaluation of teachers, but their usefulness in any kind of summative evaluation is highly questionable.

In regards to the comprehensiveness of CES evaluation, the five other identified CES values may well be incorporated into a broad-based evaluation system to provide teacher-evaluation across a fuller profile.
References


Appendix A

40 Item Survey: Student Feedback About Seminary
RE: Evaluation Study

Dear Colleague:

An instrument has been designed to encourage personal and professional growth by clarifying performance standards and expectations, providing edifying feedback, and reinforcing CES values and their application through principles of edification.

Rob Elzey, who is completing a doctorate degree at BYU, is studying the content and implementation of this evaluation instrument which is based upon the principles of edification. We would appreciate your full cooperation with the study by following the accompanying instructions.

As a participant in this study, be assured that your identity and individual scores will not be shared with CES. The data from all respondents will only be used to help determine the usefulness of the instrument. Therefore, the data will be aggregated and reported to us by Brother Elzey in the form of summary statistics only.

It is important that the data for this evaluation be gathered within a specific time-frame. Would you please give this project a high priority and COMPLETE AND RETURN the enclosed materials, as directed, by FRIDAY, 1 MAY 1998. If you will be unable to participate in the study in this time-frame, please respond immediately so that another teacher may be invited to participate in your place. Follow up or questions should be directed to Brother Elzey at the Church Office Building at (801) 240-6564 or evenings at (801) 763-0761.

We appreciate your assistance with this project. We are confident that appropriate evaluation is an important component of effective teaching and leadership in the Church Educational System. Your assistance will help to direct our efforts.

Sincerely,

Stanley A. Peterson

22 April 1998
Instructions for Teachers

Please note:
The data from this evaluation will be used only to help determine the usefulness of the Student Feedback About Seminary form. Teachers identity or the identity of the participating students is not important in this study. Code numbers are simply attached to each survey to allow for the data to be analyzed and for timely follow up with participating teachers. The data from all respondents will only be shared with CES in aggregate form to allow for anonymity.

1. Select one of your classes. A class that is heterogeneous in terms of gender, attitudes toward learning and the church, and scholastic ability, is likely to provide the best data. Please avoid administering the survey on days with high absenteeism or unusual conditions.

2. Where possible, invite another adult to administer the survey so that you can be away from the class during this time. Provide soft-lead #2 black pencils for the participating students.

3. Have the following statement read to the selected class just prior to their participating in the survey and show them the white envelope to return their surveys to.

You have the opportunity of participating in a church-wide evaluation of a new tool designed to give feedback to your seminary teacher. As you complete the survey, please be thoughtful, take the necessary time, and honestly represent your true feelings about your teacher. Your teacher will not see the results of this survey. Your survey, along with the forms of hundreds of others in the United States and Canada, will be sent to Utah and analyzed to assess the usefulness of this feedback tool. Please do not write your name or your teacher's name anywhere on the survey. Please use a soft-lead (#2) black pencil and fill in each bubble you select completely. Once completed, please slip your survey in the provided white envelope. Your help in this project is an important part of improving the seminary experience of the future.

4. Distribute a copy of the survey to each student. It is anticipated that students will need approximately 15-20 minutes to complete the survey.

5. Discard any unused surveys.

6. MAIL THE SURVEYS ON OR BEFORE FRIDAY, MAY 1, 1998. Your timely participation and mailing is crucial for the success of this project.
### Church Educational System

**Student Feedback about Seminary**

**Directions:** Please share your honest feelings about your teacher and experience in seminary by marking on the provided bubble sheet (with a #2 black lead pencil) whether you strongly agree, agree, no opinion or doesn’t apply, disagree, or strongly disagree.

<table>
<thead>
<tr>
<th>My teacher...</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion, or Doesn’t Apply</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. gets along well with the students.</td>
<td>(completely fill in bubble 0)</td>
<td>(completely fill in bubble 1)</td>
<td>(completely fill in bubble 2)</td>
<td>(completely fill in bubble 3)</td>
<td>(completely fill in bubble 4)</td>
</tr>
</tbody>
</table>

**Note:** To complete this evaluation, please turn this sheet over and write what you like about your teacher and seminary and any suggestions you have for your teacher and seminary.
Appendix B

34 Item Survey: Student Feedback About Seminary
RE: Evaluation Study

Dear Colleague:

An instrument has been designed to encourage personal and professional growth by clarifying performance standards and expectations, providing edifying feedback, and reinforcing CES values and their application through principles of edification.

Rob Elzey, who is completing a doctorate degree at BYU, is studying the content and implementation of this evaluation instrument which is based upon the principles of edification. We would appreciate your full cooperation with the study by following the accompanying instructions.

As a participant in this study, be assured that your identity and individual scores will not be shared with CES. The data from all respondents will only be used to help determine the usefulness of the instrument. Therefore, the data will be aggregated and reported to us by Brother Elzey in the form of summary statistics only.

It is important that the data for this evaluation be gathered within a specific time-frame. Would you please give this project a high priority and COMPLETE AND RETURN the enclosed materials, as directed, by FRIDAY, 24 MAY 1998. If you will be unable to participate in the study in this time-frame, please respond immediately so that another teacher may be invited to participate in your place. Follow up or questions should be directed to Brother Elzey at the Church Office Building at (801) 240-6564 or evenings at (801) 763-0761.

We appreciate your assistance with this project. We are confident that appropriate evaluation is an important component of effective teaching and leadership in the Church Educational System. Your assistance will help to direct our efforts.

Sincerely,

Stanley A. Peterson

jl
Instructions for Teachers

Please note:
The data from this evaluation will be used only to help determine the usefulness of the Student Feedback About Seminary form. Teachers identity or the identity of the participating students is not important in this study. Code numbers are simply attached to each survey to allow for the data to be analyzed and for timely follow up with participating teachers. The data from all respondents will only be shared with CES in aggregate form to allow for anonymity.

1. Select one of your classes. A class that is heterogeneous in terms of gender, attitudes toward learning and the church, and scholastic ability, is likely to provide the best data. Please avoid administering the survey on days with high absenteeism or unusual conditions.

2. Where possible, invite another adult to administer the survey so that you can be away from the class during this time. Provide soft-lead #2 black pencils for the participating students.

3. Have the following statement read to the selected class just prior to their participating in the survey and show them the white envelope to return their surveys to.

   You have the opportunity of participating in a church-wide evaluation of a new tool designed to give feedback to your seminary teacher. As you complete the survey, please be thoughtful, take the necessary time, and honestly represent your true feelings about your teacher. Your teacher will not see the results of this survey. Your survey, along with the forms of hundreds of others in the United States and Canada, will be sent to Utah and analyzed to assess the usefulness of this feedback tool. Please do not write your name or your teacher's name anywhere on the survey. Please use a soft-lead (#2) black pencil and fill in each bubble you select completely. Once completed, please slip your survey in the provided white envelope. Your help in this project is an important part of improving the seminary experience of the future.

4. Distribute a copy of the survey to each student. It is anticipated that students will need approximately 15-20 minutes to complete the survey.

5. Discard any unused surveys.

6. MAIL THE SURVEYS ON OR BEFORE FRIDAY, MAY 24, 1998. Your timely participation and mailing is crucial for the success of this project.
**Church Educational System**

**Student Feedback About Seminary**

Directions: Please share your honest feelings about your teacher and experience in seminary by marking on the provided bubble sheet (with a #2 black lead pencil) whether you:

- **Strongly Agree** (completely fill in bubble 0)
- **Agree** (completely fill in bubble 1)
- **No Opinion, or Doesn't Apply** (completely fill in bubble 2)
- **Disagree** (completely fill in bubble 3)
- **Strongly Disagree** (completely fill in bubble 4)

My teacher...

1. gets along well with the students.
2. nurtures student's growth through active participation.
3. builds relationships of trust.
4. teaches with the Spirit.
5. honors the agency of others.
6. uses a variety of presentation methods.
7. is committed to personal growth and change.
8. turns student's attention to God, rather than to themselves.
9. teaches what is right and then allows students to govern themselves.
10. keeps personal things confidential.
11. allows for and positively reinforces student responses.
12. attends students activities outside of class.
13. promotes good relations between the seminary teachers.
14. follows-up on attendance, class discipline, and my progress in class.
15. ties the learning in class into the plan of Heavenly Father.
16. serves with an eye single to the glory of God.
17. helps students to examine the scriptures in a way that helps them really think.
18. greets students at the door and knows their names.
19. helps to preserve a "safe" environment for students.
20. acknowledges the responsibility of the students in the learning.
21. has greater concern for students than for their own self-interests.
22. extends confidence in students.
23. allows students to express things and respects their opinions.
24. expands student's views.
25. doesn't play favorites with students.
26. seems unfailingly committed to the seminary program.
27. allows students opportunities to choose.
28. shows love for each student.
29. seems worthy and full of integrity.
30. creates unity.
31. assists students in finding meaning and application of the scriptures.
32. focuses on choices and their consequences.
33. follows leaders.
34. is sensitive to student's feelings.  
35. I am a **Male** (mark bubble 0) **Female** (mark bubble 1)

Note: To complete this evaluation, please turn this sheet over and write what you like about your teacher and seminary, and any suggestions you have for your teacher and seminary.
Appendix C

Glossary of Statistical Terms
GLOSSARY OF STATISTICAL TERMS

**Calis Covariance Structure Analysis**: As one method of confirmatory factor analysis, structural equation modeling using Calis (Covariance Analysis of Linear Structural Equations) estimates parameters and tests the appropriateness of linear structural equation models.

**Communality**: Equal to the sum over all factors of the squared factor loadings for a variable, communality indicates the variance which a variable has in common with the other variables in the analysis. The communality shows how well the variable is predicted by the retained factors. Similar to the $R^2$ value that would be achieved if the variable were regressed on the retained factors.

**Confirmatory Factor Analysis**: A multivariate statistical technique for testing hypotheses about the dimensions underlying a set of measured variables. A hypothesized factor model is specified and its relative fit to the data is evaluated.

**Eigenvalues**: An index (denoted using the symbol $\lambda$) that indicates the portion of the total variance of a correlation matrix that is explained by an eigenvector. The sum of the eigenvalues is equal to the number of the original variables that the given factor retains information from. Also referred to as latent roots or characteristic roots.

**Eigenvectors**: The linear functions of the variables (identified using principal-components analysis) that maximize the amount of the total variance in a correlation matrix that is explained. Also referred to as latent vectors or characteristic vectors.

**Exploratory Factor Analysis**: A methodology that is used to identify linear functions or factors, which explain the theoretical maximum amount of (remaining) common variance in a correlation matrix.

**Factors**: Dimensions that are extracted in an exploratory factor analysis or posited to exist in confirmatory factor analysis.

**Goodness-of-fit Index**: A coefficient, ranging from zero to one, that reflects the improvement in fit gained by a given CFA model over the most restrictive factor model, which is typically a null model. As a rule of thumb, a minimum GFI of .90 has been recommended in judging the acceptability of CFA models (Bentler & Bonnet, 1980).

**Kaiser’s Stopping Rule**: A stopping rule for determining the appropriate number of eigenvectors (factors) to extract, in which one retains all factors with associated eigenvalues of one or greater.
**Modification Index:** For each fixed parameter in a CFA model, a measure of the predicted decrease in chi-square if the particular parameter is freed and the model is reestimated. The constrained parameter corresponding to the largest such index is the one that, if estimated rather than fixed, will maximally improve the model’s fit.

**Oblique rotation:** Used in an attempt to achieve simple structure, this factor rotation method allows eigenvectors (factors) to be correlated.

**Orthogonal Rotation:** Used in an attempt to achieve simple structure, this factor rotation method forces eigenvectors (factors) to remain uncorrelated ($r = 0$).

**Principal Factor Analysis:** A factor analysis method that uses squared multiple correlations for the prior communality estimates.

**Scree Test:** A stopping rule for determining the appropriate number of eigenvectors (factors) to extract, in which one graphs the eigenvalues of successive eigenvectors (factors) and then draws a line of best fit, which indicates the change in eigenvalues over successive factors. The factors with eigenvalues that lie on the path of steep descent in this plot are retained. The factors with eigenvalues that come later lie on the scree slope and are not extracted.

**Simple Structure:** A Condition in which variables load at near 1 (in absolute value) or near 0 on an eigenvector (factor). Variables that load near 1 are clearly important in the interpretation of the factor, and variables that load near 0 are clearly unimportant. Simple structure thus implies the task of interpreting the factors.

**Uniqueness:** The portion of the total variance that is unrelated to other variables. Thus, uniqueness = specific variance + error variance. Also, uniqueness is equal to 1 - the communality.

**Varimax Rotation:** Used in an attempt to achieve simple structure, this factor rotation method forces eigenvectors (factors) to be uncorrelated ($r = 0$). This rotation method focuses on making as many values in each column of the factor loading coefficient table to be as close to zero as possible. This rotation method is the most popular orthogonal rotation method.

Appendix D

SAS Calis Program for Seven-Factor Hypothesis
data one;
infile data;
input v1-v34;
run;

proc calis data=one modification;
lineqs
v1 = x1 f1 + e1,
v12 = x12 f1 + e2,
v14 = x14 f1 + e14,
v18 = x18 f1 + e18,
v5 = x5 f2 + e5,
v9 = x9 f2 + e9,
v23 = x23 f2 + e23,
v27 = x27 f2 + e27,
v32 = x32 f2 + e32,
v3 = x3 f3 + e3,
v10 = x10 f3 + e10,
v22 = x22 f3 + e22,
v34 = x34 f3 + e34,
v2 = x2 f4 + e2,
v6 = x6 f4 + e6,
v11 = x11 f4 + e11,
v20 = x20 f4 + e20,
v7 = x7 f5 + e7,
v15 = x15 f5 + e15,
v17 = x17 f5 + e17,
v24 = x24 f5 + e24,
v31 = x31 f5 + e31,
v13 = x13 f6 + e13,
v19 = x19 f6 + e19,
v25 = x25 f6 + e25,
v28 = x28 f6 + e28,
v30 = x30 f6 + e30,
v4 = x4 f7 + e4,
v8 = x8 f7 + e8,
v16 = x16 f7 + e16,
v21 = x21 f7 + e21,
v26 = x26 f7 + e26,
v29 = x29 f7 + e29,
v33 = x33 f7 + e33;
std
f1 f2 f3 f4 f5 f6 f7 =7* 1.0,
E1-e34 = u1-u34;
cov
f2 f1 = the 1,
f3 f1 = the 2,
f4 f1 = the 3,
f5 f1 = the 4,
f6 f1 = the 5,
f7 f1 = the 6,
f3 f2 = the 7,
f4 f2 = the 8,
f5 f2 = the 9,
f6 f2 = the 11,
f7 f2 = the 12,
f5 f3 = the 13,
f6 f3 = the 14,
f7 f3 = the 15,
f5 f4 = the 16,
f6 f4 = the 17,
f7 f4 = the 18,
f6 f5 = the 19,
f7 f5 = the 20,
f7 f6 = the 21;
run;
Appendix E

Varimax Rotated Seven-Factor Pattern
VARIMAX ROTATED 7-FACTOR PATTERN

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Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than .40 have been flagged by an ‘*’. Flagged values at least .10 greater than any other factor for the item have been bolded.
Appendix F

Varimax Rotated Seven-Factor Pattern
Organized by Hypothesis
### VARIMAX ROTATED 7-FACTOR PATTERN ORGANIZED BY HYPOTHESIS

<table>
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<th>Item</th>
<th>Factor I (RWS)</th>
<th>Factor II (HAO)</th>
<th>Factor III (BRT)</th>
<th>Factor IV (NGTP)</th>
<th>Factor V (EV)</th>
<th>Factor VI (CU)</th>
<th>Factor VII (SWES)</th>
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</table>

#### Recognize the Worth of a Soul (RWS)
- Q1 22 **63*** 2 22 10 14 22
- Q12 19 11 6 **55*** 22 2 4
- Q14 22 25 19 26 13 **45*** -4
- Q18 14 11 19 14 **53*** 8 8

#### Honor the Agency of Others (HAO)
- Q5 33 **59*** 26 2 12 4 24
- Q9 31 **55*** 25 9 12 12 12
- Q23 **48*** 38 18 27 39 18 9
- Q27 **57*** 29 22 21 27 20 -3
- Q32 **59*** 27 36 27 18 15 7

#### Build Relationships of Trust (BRT)
- Q3 41* 48* 19 18 22 14 29
- Q10 22 **43*** 19 20 37 13 3
- Q22 **46*** 36 17 13 16 19 25
- Q34 **66*** 36 7 17 14 14 19

#### Nurture Growth Through Participation (NGTP)
- Q2 23 32 17 **44*** 11 18 47*
- Q6 12 8 8 **59*** 0 37 14
- Q11 10 **43*** 44* 36 22 20 10
- Q20 **55*** 27 35 23 9 23 15

#### Expand Vision (EV)
- Q7 20 **45*** 33 18 12 41* 16
- Q15 27 20 **43*** 32 29 30 18
- Q17 36 12 20 **24*** 26 24 **48*** 38
- Q24 **43*** 30 32 11 35 32 14
- Q31 **44*** 18 12 20 30 **41*** 18

(table continues)
(continued)

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<tr>
<th>Item</th>
<th>Factor I (RWS)</th>
<th>Factor II (HAO)</th>
<th>Factor III (BRT)</th>
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<th>Factor V (EV)</th>
<th>Factor VI (CU)</th>
<th>Factor VII (SWES)</th>
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**Create Unity (CU)**
- Q13 16 45* 34 30 11 6 1
- Q19 27 51* 12 13 35 11 13
- Q25 25 61* 24 8 11 16 -8
- Q28 49* 52* 17 12 16 17 19
- Q30 58* 32 26 23 5 30 13

**Serve With An Eye Single to the Glory of God (SWES)**
- Q4 28 32 14 16 36 24 39
- Q8 14 25 33 38 32 18 25
- Q16 24 23 57* 6 27 20 9
- Q21 47* 26 50* 19 12 9 13
- Q26 41* 39 46* -5 21 14 17
- Q29 51* 37 11 7 38 5 9
- Q33 42* 22 36 18 16 -5 38

Printed values are multiplied by 100 and rounded to the nearest integer.
Values greater than .40 have been flagged by an "+*".
Flagged values at least .10 greater than any other factor for the item have been bolded.
Appendix G

Procrustes Rotated Seven-Factor Pattern
Organized by Hypothesis
# PROCURSTES 7-FACTOR PATTERN ORGANIZED BY HYPOTHESIS

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Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than .40 have been flagged by an ‘*’. Flagged values at least .10 greater than any other factor for the item have been bolded.
Appendix H

Promax Rotated Seven-Factor Pattern
### PROMAX ROTATED 7-FACTOR PATTERN

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Printed values are multiplied by 100 and rounded to the nearest integer.
Values greater than .40 have been flagged by an ‘*’.
Flagged values at least .10 greater than any other factor for the item have been bolded.
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Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than .55 have been flagged by an ‘**’. Flagged values at least .30 greater than any other factor for the item have been bolded.