

1983

Factors underlying the grading attitude of industrial education instructors at Midwestern state universities

Anusorn Skulkhu
Iowa State University

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FACTORS UNDERLYING THE GRADING ATTITUDE OF INDUSTRIAL
EDUCATION INSTRUCTORS AT MIDWESTERN STATE UNIVERSITIES

Iowa State University

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Factors underlying the grading attitude of
industrial education instructors at midwestern state universities

by

Anusorn Skulkhu

A Dissertation Submitted to the
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DOCTOR OF PHILOSOPHY

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CHAPTER I. INTRODUCTION

Grading is one of the oldest and most controversial issues in education. For many centuries, educators have always felt the need to establish a system of symbolizing different levels of achievement among students (Cureton, 1971). The history of grading in American higher education dates back to 1636 when Harvard University began to classify students in each class into 20 groups according to their achievement levels. About a hundred years later, Yale University reduced this number of groups to only four and called them from top to bottom first, second best, inferior, and bad. The five-letter grading system which is probably the most widely used currently in the United States was first introduced at Harvard in 1880 (Smallwood, 1935).

In spite of its long history, however, grading is still a major unsolved problem in education. In fact, its meaning, purposes, and methods continue to be debated even today. Several problems concerning grading practices have arisen. The most serious among these seems to be the inconsistency of grading practices among instructors (Prather and Smith, 1976). Since a generally satisfactory solution to the grading problem has not yet been realized, the discrepancies in grading seem to be inevitable. These discrepancies will not do much damage if an institution or society does not attach great importance to grade. But, as Warren (1975) pointed out, all the evidences of practice contradict this. Grades have usually been used in selecting students for awards, honors, higher

levels of education, and jobs. Therefore, even though most problems concerning grading are still unsolved and are perhaps unlikely to be solved in the near future, educators have agreed that something should be done about them in order that a common basis be established for all who have to grade or are affected by grading (Marshall, 1971).

Statement of the Problem

The problem of grading is one of the most complex because, like most educational problems, it is composed of many components (Conklin, 1970). Among these components is the grading attitude of the instructor or the grader which has been found to have an enormous effect upon the grading practices employed (Van Dyke, 1969; O'Bryan, 1973; Murray, 1981). This grading attitude has been postulated by Dressel (1961) to have many underlying factors. In fact, Dressel proposed that there were three groups of factors underlying the grading attitude of all instructors, namely, philosophy of grading, purpose of grading, and method of grading. In his pioneering work, he also classified the philosophies of grading into three major categories. These were traditionalism, eclecticism, and relativism. Traditionalism was defined as the philosophy of those who believed that there was a basic subject matter of everlasting value that everyone should know. The function of an instructor was to transmit this subject matter. Evaluation should focus on the mastery of this core of knowledge and should be done only by the instructor since s/he knew best what should be taught and evaluated and what should be the standards for evaluation.

Grading in this philosophical school was highly subjective.

Eclecticism, on the other hand, focused on social environment. To the eclecticists, knowledge of subject matter was of secondary importance. They believed that education was interaction between organism and environment; this interaction they called experience. The function of an instructor in this school was to provide learning activities from which students would gain experiences. Evaluation focused more on problem-solving ability than mastery of subject matter, and students were to share responsibility in the evaluation process.

Relativism, in contrast to both traditionalism and eclecticism, left most of the responsibility in evaluation to the student. Relativists believed that all value systems were relative to time, place, and person. Therefore, each individual must seek or choose for himself or herself the standards for evaluation. The function of an instructor in this school was to help students develop their general ability which could be applied in various situations.

Dressel did not classify the purposes and methods of grading as he did for grading philosophies. Classifications of the remaining two groups of factors underlying the grading attitudes were proposed by Ericson (1967) and Terwilliger (1971). Ericson divided all existing purposes of grading into three classes: institution-oriented, instruction-oriented, and student-oriented. The institution-oriented purposes were those which served the interests of an institution. These included: to summarize and report the student's achievement; to maintain the

academic standards of the institution; to select students for awards, honors, and advanced levels of education; and to improve the curricula or academic programs, using the information provided by grading.

The instruction-oriented purposes served the interests of the instructor who could use the information provided by grading as a basis for the improvement of instruction, guidance, and other instructional activities.

The student-oriented purposes served the interests of the student. These included: to provide feedback to direct the student's study; to help the student to discover his or her aptitudes and choose an area of specialization or career; and to help the student improve his or her study habits.

The methods of grading were classified by Terwilliger (1971) into three categories: norm-referenced, criterion-referenced, and motivation. Norm-referenced method of grading was the grading based on norms. In this type of grading, a person's grade would be affected by grades of other students in the class. Since the function of norm-referenced measurement was to sort people out, the tests used must discriminate between students. Competition among students was usually inevitable if this method of grading was employed.

Criterion-referenced method of grading, on the other hand, used criterion behavior. Each student score would be judged against some pre-specified fixed standard of criterion-behavior. Therefore, in this type of grading, each student's grades would not be affected by the grades

received by other students.

In the motivation method of grading, neither norms nor some fixed standards were used. The evaluation standards were flexible. The grader was allowed to use different standards with different students, depending upon the backgrounds of the students being graded.

Classifications by Dressel, Ericson, and Terwilliger have been widely accepted, as can be seen in the studies by Benson (1969), Hurek (1969) and Oh (1976).

In spite of its wide acceptance, Dressel's, Ericson's, and Terwilliger's classifications remain only hypotheses forming a tentative theory.

It was the purpose of the present investigator to test this tentative theory. It was hoped that from the study, the evidences could be found which would lead to either confirmation or refutation of the theory, and thus this study would shed some light on the true nature of grading attitude in general.

Statement of Purposes

The major purpose of this study was to investigate the factor structure and the relationship among the factors of grading attitude of industrial education instructors from midwestern state universities.

Another purpose was to compare the factors of the grading attitude of the industrial education instructors who differed in sex, number of years of college teaching, academic rank, highest education degree

attained, number of college credits of educational evaluation completed, and type of courses taught.

Objectives of the Study

The objectives of the study included the following:

1. To factor analyze the grading attitude of the industrial education instructors from midwestern state universities.

2. To study the relationship among the factors of the grading attitude.

3. To compare the factors of the grading attitude of the industrial education instructors at midwestern state universities who differed in the following demographic variables:

3.1 Sex

3.2 Number of years of college teaching

3.3 Academic rank

3.4 Highest education degree attained

3.5 Number of college credits of educational evaluation completed

3.6 Type of courses taught.

4. To study the relationship between the instructors' demographic variables and each of the factors of grading attitude.

Definition of Terms

Terms used in this study were defined as follows:

Grading: An act of assigning a symbol (letter, number, word, etc.) to represent a value judgment concerning the quality of a student's performance (Terwilliger, 1977).

Grading Attitude: An organized predisposition to think, feel, perceive, or behave toward grading (Murray, 1981).

Traditionalism: The grading philosophy held by traditionalists. Traditionalists are those who believe that there is a basic subject matter of everlasting value that everybody should know; that the primary purpose of education is to transmit this basic subject matter; that this transmission is also the primary function of the instructor; and that the instructor should be solely responsible for the determination of course objectives and subjective evaluation since s/he knows best what is of more value (Dressel, 1961).

Eclecticism: The grading philosophy held by eclecticians. Eclecticians are those who believe that education is a continuing process without a true distinction between means and end; that the primary function of the instructor is to provide certain learning activities from which the student can acquire experiences which are considered to be more important than any subject matter; that the teaching, learning, and evaluating processes should be participated by both the instructor and the student (Dressel, 1961).

Relativism: The grading philosophy held by relativists. Relativists

are those who believe that truths and values are relative to place, time, and person, and it is the duty of individuals to seek truths and values for themselves; that grading done by others has no real value whatever; and that individuals should evaluate themselves using their own standards (Dressel, 1961).

Institution-oriented: A group of purposes of grading which serve the objectives of an institution. These include: to maintain the academic standards of an institution; to improve the curricula; to summarize and report student's achievement; and to select students for advanced levels of education, awards, honors, fellowship, etc. (Ericson, 1967).

Instruction-oriented: A group of purposes of grading which contribute to the improvement of instruction, student guidance, and evaluation of teaching effectiveness (Ericson, 1967).

Student-oriented: A group of purposes of grading which serve the interests of students. These include the following purposes: to provide feedback about student's study; to help students improve their ability to assess themselves; to help students choose their specializations and careers; and to help students in their improvement of study habits (Ericson, 1967).

Norm-referenced: A method of grading in which a student's performance or test score is compared to norms of the group. Therefore, each student's grade is affected by scores of other students and will be meaningful only when interpreted relatively to them. A test upon which this method of grading is based must be able to discriminate between students

or, in other words, yield enough response variance (Terwilliger, 1977).

Criterion-referenced: A method of grading in which a student's performance or test score is judged against a pre-specified standard of criterion behavior. A test upon which this method of grading is based usually covers every aspect of course objectives or at least covers every aspect of a well-defined behavior domain (Terwilliger, 1977).

Motivation: A method of grading in which students' backgrounds and study habits are taken into account, and the graders are allowed to use different standards with different students simply to motivate individual students. Also, in this type of grading, the amount of individual improvement during a period of time is considered to be no less important than an individual's standing (Terwilliger, 1977).

Hypotheses

The following hypotheses were tested:

1. Grading attitude is comprised of three groups of factors, namely, philosophy of grading, purpose of grading, and method of grading.

1.1 Philosophy of grading has three factors: traditionalism, eclecticism, and relativism.

1.2 Purpose of grading has three factors: institution-oriented, instruction-oriented, and student-oriented.

1.3 Method of grading has three factors: norm-referenced, criterion-referenced, and motivation.

2. There are no significant differences regarding the factors of the grading attitude among the instructors of different levels of

2.1 Sex

2.2 Number of years of college teaching

2.3 Academic rank

2.4 Highest education degree attained

2.5 Number of college credits of educational evaluation completed

2.6 Type of courses taught.

3. There is no linear relationship between sex, number of years of college teaching, academic rank, highest education degree attained, number of college credits of educational evaluation completed, and type of courses taught as predictors and each of the factors of grading attitude as criterion.

Delimitations of the Study

The sample used in this study included only those industrial education instructors at midwestern state universities. The results of the study, therefore, could neither be generalized to instructors in other departments of midwestern state universities nor to the industrial education instructors at other universities outside the midwest area.

The variables used in this study were limited to those items in the questionnaire. Special consideration had to be given to the fact that some aspects of grading attitude might be neglected, even though the

questionnaire was intended to cover all representative aspects.

Organization of the Study

The report of this study is organized in the following manner: Chapter I presents a statement of the problem, a statement of purposes, objectives of the study, definition of terms, research hypotheses, basic assumptions, and delimitations of the study. Chapter II reviews literature and research findings relevant to the present study. Chapter III presents methods and procedures used for selecting the sample and collecting and analyzing the data. Chapter IV gives the results from the analysis of data. The final chapter, Chapter V, contains a summarization of the findings of this study with the conclusions and suggestions for further research based on the findings.

CHAPTER II. REVIEW OF THE LITERATURE

The purpose of this chapter is to review the literature related to grading, grading attitude, and factors underlying grading attitude. Because few studies have been concerned directly with the grading attitude of industrial education instructors, it is necessary in many cases to cite research of other groups for findings which may be relevant to this study.

The literature reviewed will be arranged in the following sequence:

1. Grading and grading attitude
2. Philosophies of grading
3. Purposes of grading
4. Methods of grading
5. Discrepancies of grading practices among the instructors with different characteristics or backgrounds.

Grading and Grading Attitude

Grading has been a subject of serious debate throughout all levels of education (Carnegie Commission, 1973; White, 1975; Etzioni, 1975). Most people have heard of the problems arising from it. These problems usually included the invalidity and unreliability of grading and the discrepancies of grading practices among the instructors.

Literature concerning grading abounded. In one of the most comprehensive studies of grading in general, Warren (1971) reviewed more than

two hundred articles about grading. Of these, about one-fourth concerned grading methods. Another quarter were related to the purposes of grading. The remaining half were about a variety of topics: variability of grading standards, grade inflation, advantages and disadvantages of grading, philosophies underlying it, and its psychological and social effects.

At the higher education level, there was a comprehensive study by Wasserman (1976) who not only categorized the existing studies concerning grading but also clearly pointed out the changing role of grading as suggested by the titles of those studies. According to Wasserman, grading had changed its role so rapidly from an all-meaningful to an all-meaningless one. This could be seen from the fact that most of the studies about grading in recent times usually concerned the institutional or the societal functions instead of the teaching or learning ones as in the past. A similar view was stated by Kraft and Lunquist (1971). Pointing out some of the potential hazards of losing sight of the full meaning of grading, Kraft and Lunquist stated:

Some people now even believe that grades are the be-all and end-all of education and that they have become moral equivalents. A good grade is often correlated with good behavior and self-worth; a bad grade, with bad behavior and low self-worth. One's transcript becomes more important than one's education as grades become the substitute for learning (Kraft and Lunquist, 1971).

Correct use or misuse, the importance of grades and grading was undeniable. Grades had been used to select an individual for a job, advanced level of education, and many other kinds of rewards (Warren, 1975). The problems of grading were, therefore, inevitably serious.

Educators, however, had also tried to lessen this seriousness. They had done it not by lessening the importance of grading, but by trying to clarify the concepts related to it. Their conviction was that by knowing it more clearly, we would have more chance to solve the relevant problems. Obviously, one of the ways to know anything clearly was to know its component parts (Dressel, 1961).

In a rare study concerning the components of grading, Dressel (1961) pointed out that one of the more important components of grading was the attitude of the grader toward grading itself. Having indicated this, he postulated that this attitude was composed of three groups of factors, namely, philosophy of grading, purpose of grading, and method of grading.

Most of the rest of this chapter will be devoted to the discussion of these three groups of factors.

Philosophies of Grading

A philosophy of grading or grading philosophy was usually identified as an educational philosophy underlying the grading. Some educators (e.g., Terwilliger, 1977) contended that only the term philosophy of education, and not philosophy of grading, should be used since all educational practices, including grading, had to be necessarily based on philosophy of education. However, as Dressel (1961) pointed out, considering a philosophy of grading as something different from a philosophy of education might be helpful because there were certainly many philosophies of education in existence but obviously not as many types of grading

practices. A philosophy of grading, therefore, should be defined more broadly to include certain aspects of more than one philosophy of education.

Dressel classified philosophies of grading into three major systems which he called traditionalism, eclecticism, and relativism, respectively.

Traditionalism

Traditionalism was defined by Dressel (1961) to be the philosophy of those who believed that there was certainly a basic core of knowledge, or something of everlasting value, that every human being should know. These people were usually oriented to the past, i.e., they believed that all or almost all the significant truths and values had already been presented by the great minds of bygone years.

Therefore, a traditionalist as an educational philosopher could be said to be an essentialist and a perennialist combined. According to Wingo (1974), the essentialist believed that:

Education is the transmission of certain elements of the cultural heritage whose importance is so great that they cannot be neglected. From the standpoint of the individual, the purpose of education is to help him achieve intellectual discipline. Stated briefly, the essentialist thesis about the aim of education is intellectual training.

A similar belief was held by the perennialist who, again, according to Wingo (1974), believed that:

All men share in the same human nature and this nature is constant; it does not change. Since all men have the same nature, all men have the same natural powers. By virtue is meant all the perfection of a natural power and since all men have the same natural powers, the virtues are the same

for all men. Education is concerned with the development of man's rational powers, that is, with the formation of the intellectual virtues. Since the aim of education is the formation of the intellectual virtues, and since these virtues are the same for all men, the aim of education is the same for all men.

Having such a fundamental belief, therefore, the traditionalist emphasized the importance of teachers' responsibility in teaching and evaluating students. Teachers, they argued, should be solely responsible for the determination of course objectives because they knew best what subject matter was more valuable. Similarly, they should be the sole judge of students' level of performance. In short, the traditionalists preferred a subjective type of evaluation with some fixed standards set by the teacher (Dressel, 1961).

Traditionalistic grading had been practiced everywhere, and it could not be said to be without merit. A study by Oh (1976) showed that it suited a small group of people with high ability much better. In the past, traditionalistic grading was probably the only one in use. Bell (1944) observed that most mathematicians and natural scientists adopted this philosophical viewpoint. For example, if Gauss said that Riemann was an excellent mathematician, Riemann was, no matter how low his test scores appeared. In fact, a traditionalist would rather believe a comment of the instructor than scores from any number of formal tests.

Traditionalism was really found to be more attractive to people in some areas of study than in others. Studies by Riesman et al. (1970) and Oh (1976) demonstrated that higher percentage of natural scientists held a traditionalistic philosophy than social scientists did. This con-

firmed Bell's observations.

Eclecticism

According to Dressel (1961), educators who reconciled with the eclectic philosophy of grading were oriented to the present. Specifically, they believed that our society was pluralistic and that education should focus on a variety of the present social environments.

From a philosophy of education point of view, an eclecticist was a combination of a progressivist and a pragmatist.

John Dewey (1897) defined the progressivists to be those who believed that:

All education proceeds by the participation of the individual in the social consciousness of the race. The only true education comes through the stimulation of the child's powers by the demands of the social situations in which he finds himself.

This was equally true for the pragmatists who adopted a similar view:

Nature itself is a great complex of interactions of many and diverse kinds and one of these is experience--the interaction of a human being with the environmental media in which and by which it lives. Education is simply the system of meanings that has developed through experience and in this sense it is learned behavior.

Consequently, the eclecticists did not concern themselves too much with the past or the future. For them, education was always the present. Education, they usually said, was life itself and not the preparation for life. It was difficult, they argued, to differentiate between the process and the goal of education. Rather, it was the interaction between these two or the "experience" that we should mean by education. In the eclectic

point of view, mastery of a subject matter was of secondary importance. The eclecticists emphasized the importance of learning by doing or problem-solving. They also believed that a true function of a teacher was to provide learning activities from which the student might gain experiences. As to evaluation, they recommended that students should help the instructor in determining both the course objectives and the standards for evaluation (Dressel, 1961).

Relativism

The relativists were defined by Dressel (1961) to be those who were oriented to the future. This did not mean that they ignored the present nor discounted the past, but they believed that it was the task of an individual to seek his or her own truths and values. Truths and values, they argued, were always relative to time, place, and person. Hence, it was inappropriate for a teacher to try to make students accept the teacher's value systems. Since teacher's evaluation standards formed a value system, evaluation by teacher should be discarded. Instead, teachers should encourage students to find their own standards and evaluate themselves. Also, they should try to help them develop their general ability which could be applied in many situations.

To most relativists, grading was a nightmare or a tragedy (University of California, Berkeley, 1968). Some relativists objected to grading altogether. They considered grades to be meaningless, harmful, and unnecessary.

Miller (1967), who was one of the proponents of relativism, observed that grading systems at all levels tended to reward the conforming plodder and penalize the imaginative student who was likely to make significant contributions to nearly any field.

Another relativist, Smith (1975), stated:

It is incredible, even incomprehensible, that grades play such a major role in American education, especially when one considers the fact that grading has evolved into an un-scholarly game that has absolutely nothing to do with the primary goal of education, i.e., teaching and learning. To say that grades have done more harm than good is a gross statement, yet it is not far from truth.

It was difficult to identify the relativists with any group of educational philosophers. Probably the existentialists were among the nearest (Hoffmann, 1962). According to Kierkegaard, one of the founders of existentialism (Kaufmann, 1956),

Truth lay in the individual's own unique experience. In this sense, it is subjective, for man always stands alone. His existence precedes his being. He is condemned with complete freedom to choose and to become.

Relativistic philosophy seemed to be extreme. But certain great names in the history of human thought preferred it. Snow (1981) pointed out that the mathematician Galois, the physicist Einstein, and many other great scientists hated every kind of examination or achievement evaluation and objected to any type of grading by others whatsoever.

Purposes of Grading

Grading philosophy was one thing, purpose of grading was another. The former concerns what one believed in doing, the latter simply why one did it. Literature on grading almost totally ignored the purposes of grading (Milton, 1967; Scriven, 1969). Nevertheless, in a rare study in this area, Ericson (1967) classified the purposes of grading into three categories, namely, institution-oriented, instruction-oriented, and student-oriented.

Institution-oriented

The institution-oriented purposes of grading usually included the recording of student performance or progress for reporting or for administrative decisions such as retention or dismissal, transfer, eligibility for financial aids, employment, or improvement of the curriculum, and the maintenance of academic standard of an institution through the selection process in which students were selected for more advanced levels of education, honors, or awards (Ericson, 1967).

The most discussed, and probably the most unfortunate, function of grading was the selection function (Glazer, 1970). In spite of its rapidly increasing role, most educators were still reluctant to openly accept it as a valid function, since it contributed nothing to the realization of the true goal of education. Instead, as Jencks and Riesman (1968) pointed out, it offered the opportunity for further development to only those already most highly developed, and increased the gap between the

lower and higher segments of society with respect to whatever benefits education could provide.

A study by Lunneborg (1978) showed that the institution-oriented purposes of grading were very popular among educational administrators and sometimes among instructors but were distasteful to students. Some research findings of Perney (1975) indicated that the institution-oriented purposes of grading could demand compliance from instructors and other educational consumers as well.

Instruction-oriented

The instruction-oriented purposes of grading had been the original purposes of grading. Most educators agreed that instructional functions of grades were very important and were, in fact, true functions if not the only true ones (Sparks, 1969; Rossman, 1970). Essentially, this type of grading purposes encompassed the feedback to instructors about their teaching effectiveness. This feedback, in turn, would provide them information as to how to improve their teaching, guidance program, class activities, or the curriculum (Ericson, 1967).

It was unfortunate that the instruction-oriented purposes of grading had usually been neglected due to the over-emphasis of the institution-oriented purposes (De Nicola, 1973; Wasserman, 1976).

Student-oriented

The student-oriented purposes of grading included: providing feed-

back about student's accomplishment or progress; helping students to discover their own aptitudes and, hence, be able to make correct decisions about their future careers or specializations; providing information as to how the student could improve his or her study habits, and helping students to develop their ability to evaluate themselves (Ericson, 1967).

Another important grading purpose which was also student-oriented was to motivate students. Research findings by Stallings and Leslie (1970) revealed that most students would not learn if not graded. This, however, depended highly upon the type of students involved in the learning and evaluation processes. While some students needed formal affirmation of accomplishment, others found constraints of grades had a negative effect on their learning abilities (Sparks, 1969).

The motivation function of grading was strongly supported by instructors since it helped facilitate their instruction (Wolansky and Oranu, 1975).

Methods of Grading

There were many methods of grading in use. Among many proposed classifications, the following by Terwilliger (1977) has been hypothetically adopted in this study and would thus be discussed.

Terwilliger classified the methods of grading into three categories: norm-referenced, criterion-referenced, and motivation methods.

Norm-referenced

Norm-referenced grading was simply the grading based on norms. A norm was an estimate of some characteristic of a distribution of test scores for a specified population (Flanagan, 1951). For example, it could be a mean, a median, or any quantile value. From these definitions, norm-referenced grading could be defined as an assignment of grade to a student's score relative to these estimates. Thus, each grade received by a student under this method would be meaningful only when it was interpreted in terms of the distribution of total scores of the class. It was clear that in this way each student's grade had to be affected by the grades received by other students. The tests used to provide the scores in this type of evaluation had to be able to discriminate between students, otherwise one could not sort students out, and the scores would be uninterpretable.

The history of norm-referenced grading could be traced back to Binet's intelligence tests around the turn of the century. The method was popular as an achievement evaluation method until recently when some of its disadvantages were discovered. However, some educators still defended its merits as a method for achievement evaluation.

There were a very large number of studies about norm-referenced grading. A study by Stone (1977) showed that it did not favor industrial education students.

Criterion-referenced

Criterion-referenced grading was the method of grading in which a student's score was compared with a fixed standard of criterion behavior domain for the class. This type of evaluation was first introduced by Glaser in 1963 (Popham, 1971) with the intention that it would replace norm-referenced evaluation as the achievement evaluation method. Since that time, it had gained wider and wider acceptance among educators. Unlike norm-referenced grading with which it was usually contrasted, criterion-referenced grading provided grades which could be interpreted directly in terms of course objectives. Each student's grade was by no means affected by others' grades since no comparison between them was made. A criterion-referenced test, moreover, need not be able to discriminate between students, as did a norm-referenced test, but usually covered every aspect of the objective domain.

There were studies (De Laura, 1974; Stone, 1977) which showed that most industrial education students and instructors preferred criterion-referenced grading because it helped them improve their learning and teaching much better than the norm-referenced method of grading.

Motivation

Motivation method of grading included every method of grading which depended neither on norms or some fixed standards of criterion behavior domain. Thus, it included such methods as contract grading in which the student and the instructor made a contract about the achievement level

the student tried to achieve and self-evaluation method. Motivation method, therefore, might equally be called self-referenced grading (Terwilliger, 1977).

Motivation grading method allowed the instructor to use different evaluation standards with different students. The proponents of motivation method argued that since students had different backgrounds and potentialities, it would be senseless to apply the same standard to all of them. If the true aim of education was to help each individual realize his or her maximum, and each individual's maximum was different from others, why, then, should we try to equate them in our evaluation. Therefore, the motivationists' evaluation process was very flexible. They took the motivation evidence, e.g., student participation in class, into evaluation account. They stressed the importance of each individual progressing in his or her own terms. Sometimes they even allowed students to do course evaluation for themselves.

Sexton (1967) observed that all the grading methods other than motivation method tend to discourage, shame, and label as incompetent those who failed to possess the degree of achievement as desired by society. Motivation grading was, for this reason, closer to the spirit of education for individual development.

Discrepancies of Grading Practices
among the Instructors with Different Characteristics
or Backgrounds

Discrepancies of grading practices in higher education have been well-known among students, faculties, and administrators for years. In recent times, they even gained widespread media attention (Wolansky and Oranu, 1978). Researches dealing with this issue, like the present study, have been conducted but most of them concentrated on the "how" rather than the "why" of it. However, there were some studies which attempted to find the causes of grading inconsistencies and discrepancies in terms of the academic discipline and the characteristics or backgrounds of the instructors.

Oh (1976) said that the instructors who were natural scientists and those who were social scientists graded differently. Instructors who were natural scientists tended to assign lower grades than instructors who were social scientists. He concluded from his study that:

Natural scientists maintain strict and uniform expectations of student performance, while social scientists appear to make adjustments according to student characteristics. Natural scientists strongly disagree that it is necessary to adjust the content and level of academic material to the nature and level of the student population, while social scientists and members of humanities faculty agree. Consequently, while natural scientists appear to be traditional and inflexible in their grading practices, social scientists seem to be more adaptive to the current academic milieu.

Grading discrepancies due to the nature of the academic discipline might be serious but, as studies by Van Dyke (1969) and Mossman (1979) indicated, it was less serious than the discrepancies due to the instructors themselves. Instructors, even in the same academic discipline, graded differently. Each instructor seemed to have grading philosophy, purpose, and method and system of his or her own. These philosophy, purpose, method and system were dictated by the instructor's experiences and characteristics (Van Dyke, 1969).

In his study concerning the effect of teacher's characteristics on grading, Keech (1975) concluded that male teachers preferred criterion-referenced grading with strict standard more than female teachers. This conclusion was supported by Mossman (1979) who, beside arriving at the similar conclusion as that of Keech, also found the effect of the academic rank of the instructors on grading practices. In particular, his study revealed that the instructors of lower academic rank tended to assign higher grades than the instructors of higher academic rank.

In summarizing the reviewed literature, grades and grading have brought about many serious problems concerning the invalidity, unreliability, inconsistency, and discrepancies of them. Most people, however, recognized the necessity or the positive functions of grades and grading (Sparks, 1969; Feldmesser, 1972; McKeachie, 1976). It was suggested that the grading attitude of the instructor might be one of the factors which contributed to the grading problems. The

grading attitude was postulated to consist of three groups of factors: (1) Philosophy, with Traditionalism, Eclecticism, and Relativism factors, (2) Purpose, with institution-oriented, instruction-oriented, and student-oriented factors, and (3) Method, with norm-referenced, criterion-referenced, and motivation factors. It was also found from previous studies that some characteristics of the instructor such as sex and academic rank had an effect on grading practices and, thus, grading discrepancies.

CHAPTER III. METHODS AND PROCEDURES

The purpose of this chapter is to present the methods and procedures that were used in the sample selection, research instrumentation, data collection, and data analysis.

The Population

The target population for this study consisted of 313 instructors who had been teaching industrial education at state universities in the midwest.

The midwest area includes the following states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

The population was determined from information provided by the college catalogs department, Iowa State University Library.

The Sample

The sample consisted of 194 industrial education instructors selected from the target population excluding 62 instructors who had served as subjects for the pretest. The sampling selection method was simple random sampling without replacement using instructor as a sampling unit.

The Research Instrument

Description

The instrument used to collect data was the Grading Attitude Survey questionnaire (see Appendix A) constructed by the present investigator. The questionnaire had two parts. Part I concerned background of the questionnaire respondent. Part II had a seven-point Likert scale format. Its 45 items were divided into nine sections:

(1) Items 1 to 5 were intended to measure Traditionalism.

(2) Items 6 to 10 were intended to measure Eclecticism.

(3) Items 11 to 15 were intended to measure Relativism.

(4) Items 16 to 20 were intended to measure institution-oriented grading attitude.

(5) Items 21 to 25 were intended to measure instruction-oriented grading attitude.

(6) Items 26 to 30 were intended to measure student-oriented grading attitude.

(7) Items 31 to 35 were intended to measure norm-referenced grading attitude.

(8) Items 36 to 40 were intended to measure criterion-referenced grading attitude.

(9) Items 41 to 45 were intended to measure motivation grading attitude.

The questionnaire had been approved by the Human Subjects Committee of Iowa State University before it was pretested.

Pretest

In pretesting the questionnaire, a sample of 62 industrial education instructors were selected from the population. The sample selection method was that of simple random sampling without replacement using instructor as a sampling unit.

The questionnaire was delivered to the pretest sample on August 6, 1982. The pretest participant was given ample opportunity to comment on the instrument. Upon receiving the completed questionnaire, pretest data in Part II of the questionnaire was analyzed, and the questionnaire was revised as necessary. The pretest and revision processes were repeated until the questionnaire was found satisfactory.

The pretest data analysis included the analysis of the discriminating power for each item of Part II of the questionnaire. For this purpose, Edwards' 25% technique (Edwards, 1957) was used. This technique included performing the following steps:

1. For each questionnaire, each item in Part II was scored and the total score for each section was computed.
2. For each section, the total scores (across the questionnaires) were ranked from the highest to the lowest. Since there were nine sections, there were nine lists of total scores.
3. For each list of total scores from step 2, the top 25% and the bottom 25% were used as the high group and the low group of the corresponding section, respectively.
4. For each item, the t statistic was used to test the difference

between the item mean scores of the corresponding high and low group, i.e., the high and low groups of the section to which the item belonged. Significant t value indicated that the item had discriminating power, i.e., could discriminate between the respondents.

Also computed in the pretest data analysis was coefficient alpha reliability for each section of Part II. The computation formula was:

$$\alpha = \frac{n}{n-1} \left[1 - \frac{\sum \sigma_i^2}{\sigma_x^2} \right]$$

where

α = coefficient alpha reliability index

n = number of items in the section

$\sum \sigma_i^2$ = sum of variances of individual items in the section

σ_x^2 = variance of total scores in the section

The results of the pretest data analysis are presented in Appendix B.

Collection of the Data

Following the selection of sample, the questionnaire packets were assembled. Each packet included a copy of the cover letter and a questionnaire. The cover letter stated the auspices under which the study was being conducted and encouraged the instructor's participation. To assure anonymity, each respondent was asked to complete the questionnaire and to mail it directly to the researcher. The questionnaire was mailed to all

randomly selected industrial education instructors on September 3, 1982. A follow-up letter and a questionnaire was sent on September 21, 1982, to those who by that time had not responded to the first mailing of the questionnaire.

Methods of Data Analysis

Each returned questionnaire was carefully examined to make sure that each item had been answered. If Part II contained unanswered items, the questionnaire was eliminated. The usable questionnaires were keypunched and the following statistical methods were employed in data analysis:

1. Principal factor analysis, to find the factor structure of the grading attitude.
2. Correlation analysis, to find the relationship among the factors underlying the grading attitude.
3. Regression analysis to test the difference among the instructors with different levels of demographic variables regarding the factors underlying the grading attitude and to find the relationship between the demographic variables of the instructors and the factors of grading attitude.

The results of the statistical data analysis will be presented in Chapter IV. A discussion of conclusions and recommendations will be found in Chapter V.

CHAPTER IV. REPORT OF THE FINDINGS

The purpose of this chapter is to present the research findings generated from the analysis of the questionnaires sent to the industrial education instructors at midwestern state universities. All responses were coded, keypunched and analyzed, using the programming of Statistical Packages for Social Sciences (SPSS).

The results will be presented in five sections: (1) sample profile, (2) the results from factor analysis and the test of hypothesis 1, (3) computation and transformation of factor scores, and (4) the results from regression analysis and the test of hypotheses 2 and 3.

Sample Profile

The number of questionnaires included in the data analysis was 194. Six categories of background information on the respondents were as follows: (1) sex, (2) number of years of college teaching, (3) academic rank, (4) highest education degree attained, (5) number of college credits of educational evaluation completed, and (6) type of courses taught. Table 1 shows that most industrial education instructors were male (83%). There were less ordinary instructor (6.2%) than instructors of higher academic ranks. About half (47.9%) taught theoretical courses; the other (52.1%) taught laboratory courses. Most industrial education instructors (59.3%) had completed between 6 to 12 college credits of educational eval-

Table 1. Sample profile (categorical data)

	<u>Number</u>	<u>Percent</u>
Sex:		
Male	161	83.0
Female	33	17.0
Total	194	100.0
Number of years of college teaching:		
Five or less	69	35.5
More than five but less than fifteen	56	29.0
Fifteen or more	69	35.5
Total	194	100.0
Academic rank:		
Professor	65	33.5
Associate professor	48	24.8
Assistant professor	69	35.5
Instructor	12	6.2
Total	194	100.0
Highest education degree attained:		
Doctoral	173	89.2
Master	21	10.8
Total	194	100.0
Number of college credits of educational evaluation completed:		
Six or less	49	25.3
More than six but less than twelve	115	59.3
Twelve or more	30	15.4
Total	194	100.0
Type of courses taught:		
Theoretical	93	47.9
Laboratory	101	52.1
Total	194	100.0

uation. More information about the number of years of college teaching and the number of college credits of educational evaluation completed is presented in Table 2: the number of years of college teaching ($\bar{x} = 9.315$), and the number of college credits of educational evaluation completed ($\bar{x} = 8.429$).

Table 2: Sample profile (continuous data)

	<u>Range</u>	<u>Mean</u>	<u>Standard deviation</u>	<u>Number</u>
Number of years of college teaching	1-26	9.315	5.475	194
Number of college credits of educational evaluation completed	2-24	8.429	6.092	194

Results from Factor Analysis

Factor analysis is a statistical technique whose objective is to represent a set of observed variables, or simply variables, in terms of a smaller number of hypothetical variables or factors. Although the method of factor analysis is complicated mathematically, its rationale is very simple. It is based on the assumption that the observed variables are linear combinations of the factors. Some of these factors are assumed to be common to two or more variables, and some are assumed to be unique to each variable. The unique factors are furthermore assumed to be orthogonal or independent to each other and, therefore, do not contribute to the correlations among variables. In other words, only common factors

contribute to the correlations among the variables. The function of factor analysis is to find the best set of such common factors, i.e., the one which explains most of the covariation among the observed variables.

A correlation analysis of the forty-five items in Part II of the questionnaire was performed. Table 3 shows that most of the correlations were highly positive and none was significantly negative.

The forty-five items were then factor analyzed by the principal factor method. Seven initial factors were obtained. The correlations among the seven initial factors were evaluated. Table 4 shows that all the correlations among the initial factors were not statistically significant at .05 level. Therefore, an orthogonal (varimax) rotation of the initial factors was performed to provide a clearer interpretation of the item loadings which were the correlations between the variables and the factors. Table 5 presents the factor loadings after varimax rotation, together with the communalities.

For each factor, the variables with significant (.40) loadings on that factor were singled out and used in the interpretation and naming of the factor. The factors together with the variables with significant loadings in order of magnitude were as follows:

Factor I, titled student-oriented grading attitude, is presented in Table 6. The items which made up this factor were primarily concerned with grading attitudes which were student-oriented or instruction-oriented. The factor would have been titled "student and instruction-oriented" because items 22, 23 and 25, which were instruction-oriented,

Table 3. Correlations among forty-five items

Item	1	2	3	4	5	6	7	8	9	10	11
1											
2	.39										
3	.47	.62									
4	.37	.66	.57								
5	.40	.70	.71	.66							
6	.56	.23	.34	.18	.13						
7	.30	.57	.62	.65	.55	.23					
8	.45	.24	.37	.21	.19	.56	.27				
9	.57	.23	.36	.21	.18	.49	.36	.47			
10	.48	.27	.25	.20	.12	.60	.28	.46	.56		
11	.53	.22	.24	.24	.07	.53	.35	.57	.58	.57	
12	.45	.25	.27	.18	.12	.48	.28	.50	.52	.57	.52
13	.02	.01	.05	.03	.12	.11	.06	.10	.09	.02	.10
14	.46	.22	.36	.19	.17	.49	.37	.50	.50	.51	.49
15	.10	.02	.04	.08	.12	.14	.11	.06	.13	.03	.13
16	.31	.47	.41	.34	.38	.20	.34	.28	.25	.17	.20
17	.22	.38	.40	.39	.38	.17	.37	.28	.26	.22	.16
18	.25	.36	.41	.40	.40	.17	.37	.20	.09	.10	.09
19	.36	.21	.24	.27	.27	.22	.13	.19	.21	.24	.19
20	.30	.49	.33	.41	.38	.19	.31	.34	.17	.23	.14
21	.44	.30	.27	.30	.24	.34	.32	.35	.33	.35	.41
22	.37	.27	.23	.26	.22	.35	.22	.33	.27	.38	.25
23	.50	.29	.37	.33	.30	.37	.31	.30	.35	.33	.38
24	.40	.38	.33	.34	.34	.35	.36	.29	.19	.21	.26
25	.41	.26	.33	.29	.27	.34	.26	.28	.33	.36	.29
26	.40	.32	.32	.17	.28	.35	.21	.26	.16	.19	.22
27	.48	.30	.32	.31	.24	.33	.24	.20	.35	.36	.35
28	.33	.22	.28	.23	.24	.21	.19	.22	.16	.19	.16
29	.40	.32	.36	.33	.35	.31	.23	.28	.18	.25	.23

<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------

.21											
.56	.15										
.16	.72	.13									
.16	.09	.24	.12								
.19	.09	.22	.12	.51							
.09	-.04	.17	.03	.57	.61						
.15	.07	.19	.15	.23	.30	.22					
.17	-.04	.16	.04	.66	.50	.63	.27				
.31	.05	.36	.04	.15	.21	.15	.13	.16			
.39	.12	.36	.14	.17	.23	.17	.60	.16	.22		
.34	-.00	.37	.05	.18	.21	.17	.65	.20	.29	.70	
.17	.04	.27	.08	.22	.21	.23	.21	.26	.66	.27	.26
.29	-.01	.33	.07	.21	.24	.17	.66	.18	.27	.69	.66
.26	.01	.30	.04	.14	.10	.17	.50	.19	.20	.57	.60
.38	-.01	.33	.03	.15	.20	.12	.61	.21	.27	.67	.73
.19	.05	.26	.06	.05	.16	.11	.59	.11	.19	.60	.62
.27	.09	.31	.14	.19	.20	.22	.63	.23	.26	.72	.68

Table 3. (continued)

<u>Item</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	<u>32</u>	<u>33</u>	<u>34</u>
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25	.23										
26	.39	.56									
27	.24	.67	.56								
28	.24	.62	.59	.63							
29	.33	.66	.60	.64	.58						

35 36 37 38 39 40 41 42 43 44

Table 3. (continued)

<u>Item</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>
30	.43	.32	.39	.31	.33	.31	.26	.29	.25	.29	.31
31	.38	.21	.24	.13	.07	.56	.08	.44	.46	.47	.37
32	.35	.10	.21	.04	.03	.49	.07	.39	.36	.28	.32
33	.40	.14	.18	.07	.10	.39	.03	.29	.41	.35	.27
34	.39	.18	.26	.12	.15	.42	.18	.34	.48	.45	.36
35	.36	.19	.17	.25	.18	.35	.17	.26	.25	.43	.26
36	.28	.25	.31	.20	.24	.31	.31	.27	.18	.28	.21
37	.19	.32	.29	.29	.31	.18	.34	.21	.15	.15	.09
38	.25	.29	.31	.19	.23	.27	.29	.30	.24	.14	.22
39	.32	.31	.30	.24	.21	.29	.27	.33	.14	.21	.22
40	.30	.28	.24	.24	.19	.22	.28	.19	.16	.24	.21
41	.28	.10	.10	.06	-.02	.41	.08	.31	.36	.14	.36
42	.40	.37	.30	.27	.28	.27	.27	.24	.17	.30	.19
43	.40	.35	.27	.32	.21	.27	.25	.26	.22	.11	.36
44	.35	.36	.32	.30	.21	.21	.26	.24	.09	.28	.28
45	.32	.29	.23	.25	.25	.19	.24	.17	.06	.22	.16

<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
.30	.04	.32	.09	.21	.23	.22	.64	.21	.22	.61	.65
.37	.02	.29	.00	.32	.21	.19	.14	.19	.31	.19	.20
.40	.01	.33	.03	.26	.20	.16	.10	.22	.25	.17	.15
.34	-.04	.29	-.01	.22	.11	.12	.18	.13	.28	.15	.20
.41	.01	.38	.09	.28	.21	.18	.13	.27	.29	.17	.21
.23	-.00	.21	.11	.20	.17	.15	.30	.19	.35	.26	.34
.09	.05	.26	.10	.30	.36	.30	.20	.24	.30	.22	.32
.12	.02	.22	.02	.24	.33	.26	.07	.21	.24	.25	.19
.18	.06	.31	.05	.39	.33	.33	.16	.35	.22	.23	.31
.23	.06	.27	.09	.26	.33	.24	.23	.25	.36	.32	.32
.18	.10	.26	.15	.22	.25	.29	.11	.28	.32	.19	.20
.29	.09	.43	.13	.09	.15	.10	.08	.12	.26	.17	.14
.19	.02	.30	.13	.20	.25	.30	.14	.24	.31	.22	.24
.28	.04	.32	.07	.15	.25	.17	.22	.23	.40	.23	.29
.26	-.04	.26	-.05	.23	.27	.27	.17	.29	.37	.26	.29
.16	-.01	.25	.08	.15	.25	.22	.16	.20	.28	.19	.23

Table 3. (continued)

<u>Item</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	<u>32</u>	<u>33</u>	<u>34</u>
30	.31	.59	.68	.59	.56	.64					
31	.23	.17	.16	.15	.06	.17	.18				
32	.24	.09	.24	.14	.05	.14	.15	.60			
33	.20	.15	.26	.22	.07	.15	.17	.56	.46		
34	.23	.14	.22	.22	.09	.20	.24	.59	.64	.46	
35	.25	.26	.22	.30	.17	.21	.29	.46	.39	.39	.35
36	.42	.18	.29	.26	.32	.25	.29	.17	.13	.12	.12
37	.25	.20	.20	.21	.29	.29	.23	.08	.07	.07	.16
38	.26	.22	.24	.23	.30	.24	.31	.16	.08	.11	.12
39	.39	.28	.34	.33	.31	.34	.38	.16	.12	.17	.11
40	.22	.13	.14	.19	.18	.14	.13	.17	.27	.12	.17
41	.18	.18	.07	.15	.09	.09	.11	.35	.33	.19	.29
42	.29	.21	.27	.17	.17	.19	.18	.19	.26	.16	.14
43	.35	.28	.26	.28	.30	.22	.28	.18	.22	.16	.22
44	.36	.24	.29	.28	.21	.26	.27	.13	.22	.12	.16
45	.34	.23	.26	.16	.18	.19	.24	.11	.13	.15	.08

<u>35</u>	<u>36</u>	<u>37</u>	<u>38</u>	<u>39</u>	<u>40</u>	<u>41</u>	<u>42</u>	<u>43</u>	<u>44</u>
.21									
.05	.57								
.19	.65	.56							
.23	.70	.52	.61						
.20	.33	.27	.38	.35					
.21	.23	.17	.22	.16	.42				
.21	.36	.28	.32	.39	.67	.39			
.21	.29	.26	.22	.33	.55	.46	.57		
.17	.25	.20	.29	.29	.54	.36	.57	.61	
.15	.34	.23	.26	.43	.55	.38	.62	.54	.52

Table 4. Correlations among the initial factors

<u>Factor</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>	<u>VI</u>
I						
II	.091					
III	.048	.024				
IV	.035	.072	.038			
V	.040	.106	.061	-.081		
VI	.021	.093	.092	.061	-.046	
VII	.004	.016	.060	.093	.091	.083

were included. However, in the investigator's opinion, items 21 and 24 more clearly represented instruction-oriented purposes, and if these two were not included in Factor I, and they were not, then the factor should have only "student" in its title. Moreover, all five items which were student-oriented were definitely included.

Factor II, titled eclectic grading attitude, is presented in Table 7. The items which made up this factor were intended to measure eclectic, relativistic, or traditionalistic grading attitudes. But the reason for naming the factor "eclectic" was that more items from the eclectic grading attitude were included. Moreover, eclectic grading attitude was the broadest among the three philosophies. It allowed a variety of ideas and, therefore, could easily encompass some aspects of other philosophies.

Table 5. Varimax rotated factor matrix

Item	Factor							h ²
	I	II	III	IV	V	VI	VII	
1	.361	.428	.266	.305	.334	.073	.063	.576
2	.175	.117	.203	.691	.073	.098	.287	.660
3	.209	.219	.097	.651	.115	.168	.265	.620
4	.202	.116	.165	.702	-.019	.027	.255	.641
5	.210	-.035	.077	.779	.056	.083	.269	.730
6	.209	.550	.126	.069	.432	.169	.018	.582
7	.095	.308	.119	.656	-.092	.186	.197	.630
8	.168	.555	.095	.120	.263	.197	.101	.478
9	.136	.690	.001	.145	.266	.035	.089	.595
10	.197	.680	.067	.086	.228	.040	.065	.571
11	.157	.696	.152	.117	.179	.062	-.015	.580
12	.200	.650	.118	.081	.206	-.002	.038	.525
13	.013	.113	-.004	.032	-.040	.036	-.007	.017
14	.203	.609	.197	.103	.142	.152	.057	.509
15	.066	.066	.065	.020	.023	.011	.046	.016
16	.061	.113	.035	.250	.212	.166	.680	.572
17	.116	.130	.143	.228	.059	.207	.595	.503
18	.089	-.012	.156	.257	.105	.158	.689	.608
19	.780	.020	.040	.038	.110	-.023	.219	.672
20	.113	.055	.156	.246	.146	.089	.681	.593
21	.121	.267	.303	.318	.312	.227	-.131	.445
22	.770	.235	.101	.042	.047	.086	.076	.676
23	.780	.249	.108	.145	.079	.108	.048	.726
24	.191	.063	.262	.399	.325	.307	-.083	.475
25	.762	.232	.101	.113	.019	.032	.083	.666
26	.686	.035	.129	.146	.226	.159	-.036	.588
27	.757	.269	.093	.116	.056	.068	.035	.677
28	.736	.070	.108	.080	-.035	.199	-.024	.606
29	.771	.081	.059	.179	.111	.118	.075	.668

Table 5. (continued)

Item	Factor							h^2
	I	II	III	IV	V	VI	VII	
30	.726	.127	.073	.175	.133	.148	.078	.625
31	.036	.363	.048	.004	.709	.042	.158	.666
32	.026	.278	.176	-.057	.683	-.018	.149	.602
33	.107	.247	.049	.022	.602	.025	.047	.661
34	.066	.369	.055	.061	.593	-.006	.166	.526
35	.226	.141	.118	.097	.470	.061	.073	.325
36	.163	.065	.200	.107	.105	.798	.132	.748
37	.125	.093	.144	.197	-.031	.593	.157	.461
38	.153	.185	.167	.048	-.010	.693	.296	.656
39	.252	.093	.256	.113	.098	.697	.086	.653
40	.061	.105	.716	.068	.070	.179	.186	.601
41	.006	.395	.487	-.130	.181	.078	.069	.451
42	.093	.063	.740	.159	.125	.176	.121	.646
43	.179	.205	.702	.156	.086	.083	.026	.607
44	.178	.121	.683	.167	.059	.076	.129	.567
45	.129	.023	.684	.143	.061	.189	.053	.547
Eigenvalue	12.877	3.401	3.299	2.163	1.600	1.445	1.252	
Percent of variance	47.8	12.6	12.2	8.0	5.9	5.4	4.6	Total 96.5

Table 6. Factor I: Student-oriented grading attitude

Item	Rotated factor loadings
23. Grades provide valuable information as to how to group students for class activities	.780
19. Grades provide the best information as to whether a student will be successful in his or her further study	.779
29. Grades provide valuable information for the student in selecting his or her future career or specialization	.771
22. Grades provide valuable information for the instructor to improve his or her student guidance	.770
25. Grades provide valuable information for the instructor to develop special programs, projects, etc., to meet individual student's need	.762
27. Grades help students to improve their ability to assess their own work	.757
28. Grades help students to discover their own aptitude	.736
30. Grades provide valuable information for the students to improve their study habits	.726
26. Grades provide useful information about student's progress	.686

Table 7. Factor II: Eclectic grading attitude

Item	Rotated factor loadings
11. The primary function of education is to help develop students' general ability so that they will be able to solve their future problems	.694
9. Students should be allowed to help determine the standards that could provide bases for course grading	.690
10. Knowledge of the core of subject matter is less important than the experience derived from direct contact with contemporary society or social situation in which one lives	.680
12. It is important that the instructor does not inculcate in the student what the instructor believes to be true or considers to be of value but should encourage the student to seek his or her own truth and values	.650
14. Students should be encouraged to find their own standards and evaluate themselves	.609
8. It is important that students help their instructor in determining the objectives for the course of study	.555
6. Education is a continuing reconstruction of experience; that the process and the goal of education are one and the same thing	.550
1. The major purpose of education is to transmit certain elements of cultural heritage whose importance is so great that they cannot be neglected	.428

Factor III, titled motivation grading attitude, is presented in Table 8. The items which made up this factor primarily supported the motivation method of grading.

Factor IV, titled traditionalistic grading attitude, is presented in Table 9. With the exception of item 7, all the other items which made up this factor supported traditionalism.

Table 8. Factor III: Motivation grading attitude

Item	Rotated factor loadings
42. Gained score or student's progress is as important as obtained score or student's achievement level	.740
40. Student should be encouraged to compete with his or her own past instead of competing with others	.716
43. Each student's background should also be considered in student evaluation	.702
45. Sometimes the low achieving student should be given extra work to do to meet the standard	.684
44. Student's attendance and participation in class activities is one reasonable basis for grade assignment	.683
41. Students, even in the same class, should not be judged by the same standards	.487

Table 9. Factor IV: Traditionalistic grading attitude

Item	Rotated factor loadings
5. Students should be graded primarily on the basis of their mastery of a body of subject matter	.779
4. The instructor is the best judge of the student's level of performance and the judgment should be allowed to be subjective	.703
2. The primary function of an instructor is to inform the student directly about subject matter	.691
7. The primary function of an instructor is to provide certain learning activities from which the student acquires physical and intellectual skills	.656
3. The instructor should be solely responsible for the determination of course objectives since he or she knows best what the student should learn	.651

Factor V, titled norm-referenced grading attitude, is presented in Table 10. With the exception of item 6, all the other items which made up this factor were concerned with norm-referenced grading.

Table 10. Factor V: Norm-referenced grading attitude

Item	Rotated factor loadings
31. Competition among students is highly motivating; grades should be assigned competitively to take advantage of this fact	.709
32. A test should be able to discriminate students into high/low achieved groups	.683
33. A norm from a class is more reliable and justifiable as a standard for student evaluation than a pre-specified criterion	.602
34. Grades are meaningful only when they reflect a student's position relative to the class	.593
35. The instructor should not assign grades before he or she knows all students' scores	.470
6. Education is a continuing reconstruction of experience; that the process and the goal of education are one and the same thing	.432

Factor VI, titled criterion-referenced grading attitude, is presented in Table 11. The items which made up this factor were concerned with criterion-referenced grading.

Table 11. Factor VI: Criterion-referenced grading attitude

Item	Rotated factor loadings
36. Comprehensive examinations are appropriate for the evaluation of student achievement	.798
39. A high score should mean that a student has mastered some well-defined domain of knowledge	.697
38. A test need not be able to discriminate students but should cover every aspect of the course objectives	.693
37. Student's performance should be judged against a pre-specified criterion	.593

Factor VII, titled institution-oriented grading attitude, is presented in Table 12. The items which made up this factor supported the institutional functions of grading.

Table 12. Factor VII: Institution-oriented grading attitude

Item	Rotated factor loadings
18. Grading is the most appropriate method of summarizing and reporting student's achievement	.698
20. Grades are useful devices for screening and selecting students for fellowship, awards, honors, employment, etc.	.681
16. Grading is a valuable tool for the maintenance of academic standards of an institution	.680
17. Grades provide valuable information for the improvement of curriculum	.595

Examination of the factors suggested that the seven factors could be grouped into three groups. Group 1 was concerned with the philosophies of grading. This group consisted of Factor II and Factor IV. Group 2, which was concerned with the purposes of grading, consisted of Factor I and Factor VII. Factor III, Factor V, and Factor VI constituted Group 3 because each of these factors was concerned with the methods of grading.

Careful examination of Table 5 also revealed that Item 6 loaded significantly on two factors, namely, Factor II: eclectic grading attitude, and Factor V: norm-referenced grading attitude. Item 21 and Item 24 did not have significant loadings on any of the seven factors.

Test of Hypothesis 1

Hypothesis 1. Grading attitude is comprised of three groups of factors, namely, philosophy of grading, purpose of grading, and method of grading.

- 1.1 Philosophy of grading has 3 factors: traditionalism, eclecticism, and relativism.
- 1.2 Purpose of grading has 3 factors: institution-oriented, instruction-oriented, and student-oriented.
- 1.3 Method of grading has 3 factors: norm-referenced, criterion-referenced, and motivation.

The factor analysis indeed yielded three groups of factors, namely, philosophy of grading, purpose of grading, and method of grading but with the following factor structures:

Philosophy of grading had only two factors: traditionalism and eclecticism.

Purpose of grading had only two factors: institution-oriented and

student-oriented.

Method of grading had three factors: norm-referenced, criterion-referenced, and motivation.

Comparing the results of factor analysis with the hypothesis, the investigator rejected Hypothesis 1.1 and Hypothesis 1.2 and retained Hypothesis 1.3.

Computation and Transformation of Factor Scores

After the factor analysis, the factor scores of each instructor were computed using a regression method. These factor scores were approximately standardized with mean exactly zero and standard deviation approximately one. These individual factor scores were then linearly transformed to a scale with mean four and standard deviation one to approximate the scores from the original scale (Harman, 1967). The transformed factor scores were then used in the regression analysis.

Results from Regression Analysis

In order to test the differences among the instructors of different levels of demographic variables and to evaluate the linear relationships between all the demographic variables and each of the factors of grading attitude, multiple regression analysis was performed using dummy variables for categorical data. If the regression coefficient for a variable was statistically significant, which indicated that the grading attitudes of different categories of the variable were different, then Scheffé multiple

comparison method was used to determine which of the categories differed significantly from each other.

In the analysis, only the number of years of college teaching and the number of credits of educational evaluation completed were used in two different ways: (1) They were used as continuous variables in regression analysis for the purpose of determining the linear relationships between all the demographic variables and each of the factors of grading attitude in the most accurate possible way. (2) They were used as categorical variables in multiple comparison to provide more appropriate interpretation regarding the differences of grading attitude among the instructors.

The dummy representations were as follows:

Sex = 1 if the respondent was male; 0 otherwise;

Rank 1 = 1 if the respondent was a professor; 0 otherwise;

Rank 2 = 1 if the respondent was an associate professor; 0 otherwise;

Rank 3 = 1 if the respondent was an assistant professor; 0 otherwise;

Degree = 1 if the respondent had a doctoral degree; 0 otherwise;

Course = 1 if the respondent taught theoretical courses; 0 otherwise.

Table 13 presents the results of regression analysis of student-oriented grading attitude using all demographic variables as predictors.

The correlation coefficients indicated that student-oriented grading attitude was highly correlated with academic rank and degree.

The regression coefficients were statistically significant for academic rank. This suggested that the instructors of different academic

Table 13. Regression analysis of student-oriented grading attitude

<u>Variable</u>	<u>Zero order correlation</u>	<u>Regression B</u>	<u>Coefficient beta</u>	<u>Standard error</u>	<u>t</u>
Sex	.114	.427	.158	.395	1.081
Years	.076	.047	.258	.027	1.748
Rank 1	-.256**	-1.350**	-.635	.242	-5.579
Rank 2	-.262**	-1.703**	-.732	.348	-4.893
Rank 3	.103	.318	.153	.308	1.031
Degree	-.270**	-3.206**	-.994	.467	-6.865
Credits	.022	.019	.116	.024	0.807
Courses	.015	-.121	-.061	.296	-0.408
(Constant)		4.936			
n = 194		$R^2 = .225^{**}$		F = 6.71	

** Significant at .01 level.

ranks were different regarding student-oriented grading attitude. The Scheffé method was used to determine which of the academic ranks differed from each other.

The four levels of academic rank, together with the number of the instructors at each level, were as follows:

<u>Academic rank</u>	<u>n</u>
Professor	65
Associate professor	48
Assistant professor	69
Instructor	12

The Scheffé method revealed the difference ($p = .05$) in student-oriented grading attitude between instructors ($\bar{x} = 5.710$) on the one hand and professors ($\bar{x} = 3.923$), associate professors ($\bar{x} = 3.847$), and assistant professors ($\bar{x} = 3.882$) on the other hand.

The regression coefficient was also statistically significant for degree. This suggested that the instructors of different degrees were different regarding student-oriented grading attitude.

The two degrees, together with the number of the instructors with each degree and the means of student-oriented grading attitude, were as follows:

<u>Degree</u>	<u>n</u>	<u>Mean</u>
Doctoral	173	3.942
Master's	21	4.483

The squared multiple correlation coefficient indicated that the demographic variables explained 22.5 percent of variance in student-oriented grading attitude. This was statistically significant. There was a linear relationship between all demographic variables and student-oriented grading attitude.

Table 14 presents the results of regression analysis of eclectic grading attitude using all demographic variables as predictors.

The results of regression analysis indicated that none of the demographic variables was significantly correlated with eclectic grading attitude. Also, none of the demographic variables contributed significantly to the regression equation. This suggested that there were no

Table 14. Regression analysis of eclectic grading attitude

Variable	Zero order correlation	Regression B	Coefficient beta	Standard error	t
Sex	-.113	-.528	-.195	.462	-1.142
Years	-.068	-.035	-.192	.032	-1.102
Rank 1	.167	.469	.220	.369	1.270
Rank 2	.157	.519	.223	.408	1.271
Rank 3	.058	.044	.021	.361	0.122
Degree	.174	.895	.277	.547	1.636
Credits	-.006	-.029	-.177	.028	-1.047
Courses	-.101	.209	.105	.346	0.603
(Constant)		3.593			
	n = 194	$R^2 = .051$			F = 1.248

differences among instructors of different levels of demographic variables. The squared multiple correlation coefficient indicated that only 5 percent of variance in eclectic grading attitude was explained by all demographic variables. This was not significant. There was no linear relationship between all the demographic variables and eclectic grading attitude.

Table 15 presents the results of regression analysis of motivation grading attitude using all demographic variables as predictors.

The correlation coefficients indicated that motivation grading attitude was correlated with degree and credits.

The regression coefficient was statistically significant for degree. This suggested that the instructors of different degrees were different

Table 15. Regression analysis of motivation grading attitude

<u>Variable</u>	<u>Zero order correlation</u>	<u>Regression B</u>	<u>Coefficient beta</u>	<u>Standard error</u>	<u>t</u>
Sex	-.117	-.716	-.265	.397	-1.803
Years	-.084	-.013	-.071	.027	-0.474
Rank 1	-.019	-.333	-.157	.317	-1.050
Rank 2	.122	.663	.285	.350	1.895
Rank 3	-.072	.194	.093	.310	0.625
Degree	-.194*	-1.114*	-.345	.470	-2.371
Credits	-.269**	-.128**	-.780	.026	-5.353
Courses	-.106	-.157	-.079	.297	-0.528
(Constant)		2.733			
	n = 194	R ² = .242**		F = 7.369	

* Significant at .05 level.

** Significant at .01 level.

regarding motivation grading attitude.

The two degrees, together with the number of the instructors with each degree and the means of motivation grading attitude, were as follows:

<u>Degree</u>	<u>n</u>	<u>Mean</u>
Doctoral	173	3.729
Master's	21	4.628

The regression coefficient was also statistically significant for credits. In order to test the differences among the instructors in this case, however, the number of credits of evaluation completed was treated

as a categorical variable to facilitate the interpretation.

The three levels of credits, together with the number of the instructors at each level, were as follows:

<u>Number of credits of educational evaluation completed</u>	<u>n</u>
Six or less	49
More than six but less than twelve	115
Twelve or more	30

The Scheffé method did not reveal the difference ($p = .05$) in motivation grading attitude among the instructors from three levels of credit. This might be because the reduction of the number of groups to only three groups or three categories resulted in the reduction of variance and led to the insignificance of differences. There were no significant differences among the instructors of different levels of number of credits of educational evaluation completed regarding motivation grading attitude.

The squared multiple correlation coefficient indicated that 24.2 percent of variance in motivation grading attitude was explained by all demographic variables. This was statistically significant. There was a linear relationship between all demographic variables and motivation grading attitude.

Table 16 presents the results of regression analysis of traditionalistic grading attitude using all the demographic variables as predictors.

Table 16. Regression analysis of traditionalistic grading attitude

Variable	Zero order correlation	Regression B	Coefficient beta	Standard error	t
Sex	-.136	-.234	-.087	.458	-0.512
Years	-.120	-.033	-.181	.031	-1.067
Rank 1	-.070	.347	.163	.365	0.951
Rank 2	.184	.459	.197	.404	1.136
Rank 3	-.022	-.176	-.084	.357	-0.492
Degree	.082	.331	.103	.541	0.612
Credits	.060	.012	.073	.028	0.445
Courses	-.123	-.122	-.061	.342	-0.356
(Constant)		3.486			
	n = 194	R ² = .046		F = 1.124	

Table 16 indicated that none of the demographic variables was significantly correlated with traditionalistic grading attitude. Also, none contributed significantly to the regression equation. This suggested that there were no differences among the instructors of different levels of demographic variables regarding traditionalistic grading attitude. The squared multiple correlation coefficient indicated that only 4.6 percent of the variance in traditionalistic grading attitude was explained by all demographic variables. This was not statistically significant. There was no linear relationship between all demographic variables and traditionalistic grading attitude.

Table 17 presents the results of regression analysis of norm-

Table 17. Regression analysis of norm-referenced grading attitude

Variable	Zero order correlation	Regression B	Coefficient beta	Standard error	t
Sex	.139	.284	.105	.384	0.739
Years	-.063	.021	.115	.026	0.795
Rank 1	-.374***	-1.334**	-.627	.307	-4.344
Rank 2	-.260**	-1.294**	-.556	.339	-3.818
Rank 3	-.199*	-1.095	-.399	.455	-2.407
Degree	.134	.402	.193	.300	1.340
Credits	-.064	.035	.213	.024	1.452
Courses	.005	-.060	-.030	.288	-0.208
(Constant)		4.310			
	n = 194	R ² = .250**		F = 7.690	

* Significant at .05 level.

** Significant at .01 level.

*** Significant at .001 level.

referenced grading attitude using all the demographic variables as predictors.

The correlation coefficients indicated that academic rank was negatively correlated with norm-referenced grading attitude.

The regression coefficient was statistically significant for academic rank. This suggested that the instructors of different academic ranks were different regarding norm-referenced grading attitude.

The four levels of academic rank, together with the number of the instructors at each level, were as follows:

<u>Academic rank</u>	<u>n</u>
Professor	65
Associate professor	48
Assistant professor	69
Instructor	12

The Scheffé method revealed the difference ($p = .05$) in norm-referenced grading attitude between instructors ($\bar{x} = 3.333$) on the one hand and professors ($\bar{x} = 4.1009$), associate professors ($\bar{x} = 3.809$), and assistant professors ($\bar{x} = 4.137$) on the other hand.

The squared multiple correlation coefficient indicated that the demographic variables explained 25.0 percent of variance in norm-referenced grading attitude. This was statistically significant. There was a linear relationship between all demographic variables and student-oriented grading attitude.

Table 18 presents the results of regression analysis of criterion-referenced grading attitude using all the demographic variables as predictors.

Table 18 indicated that academic rank, degree, and credits were correlated with criterion-referenced grading attitude.

The statistically significant regression coefficient for academic rank suggested that the instructors of different academic rank were different regarding criterion-referenced grading attitude. The Scheffé method was used to determine which of the academic ranks differed from each other.

Table 18. Regression analysis of criterion-referenced grading attitude

<u>Variable</u>	<u>Zero order correlation</u>	<u>Regression B</u>	<u>Coefficient beta</u>	<u>Standard error</u>	<u>t</u>
Sex	.125	.393	.145	.386	1.018
Years	-.048	.027	.164	.026	1.133
Rank 1	.396***	.941**	.442	.308	3.056
Rank 2	.135	.434	.187	.340	1.276
Rank 3	-.031	-.067	-.032	.301	-0.222
Degree	.272**	1.206**	.374	.456	2.644
Credits	.203*	.057*	.312	.026	2.181
Courses	-.140	.531	-.266	.289	-1.839
(Constant)		1.661			
	n = 194	R ² = .270**		F = 8.546	

* Significant at .05 level.

** Significant at .01 level.

*** Significant at .001 level.

The four levels of academic rank, together with the number of the instructors at each level, were as follows:

<u>Academic rank</u>	<u>n</u>
Professor	65
Associate professor	48
Assistant professor	69
Instructor	12

The Scheffé method revealed the difference ($p = .05$) in criterion-referenced grading attitude between professors ($\bar{x} = 4.372$) on the one hand and associate professors ($\bar{x} = 3.599$), assistant professors ($\bar{x} = 3.999$), and instructors ($\bar{x} = 3.609$) on the other hand.

The regression coefficient was also statistically significant for degree. This suggested that the instructors with doctoral degrees and the instructors with master's degrees were different regarding criterion-referenced grading attitude.

The two degrees, together with the number of the instructors with each degree and the means of criterion-referenced grading attitude, were as follows:

<u>Degree</u>	<u>n</u>	<u>Mean</u>
Doctoral	173	4.109
Master's	21	3.112

Also statistically significant was the regression coefficient for credits. Again, the data were treated as categorical data for more meaningful interpretation for testing differences among group means.

The three levels of number of credits of educational evaluation completed, together with the number of the instructors at each level, were as follows:

<u>Number of credits of educational evaluation completed</u>	<u>n</u>
Six or less	49
More than six but less than twelve	115
Twelve or more	30

The Scheffé method revealed the difference ($p = .05$) in criterion-referenced grading attitude between the instructors who had completed six or less than six credits of educational evaluation ($\bar{x} = 3.640$) and the instructors who had completed more than six but less than twelve credits of educational evaluation ($\bar{x} = 4.169$). The criterion-referenced grading attitude mean for the instructors who had completed twelve or more credits of educational evaluation is 3.947.

The squared multiple correlation coefficient indicated that 27.0 percent of variance in criterion-referenced grading attitude was explained by all the demographic variables. This was statistically significant. There was a linear relationship between all the demographic variables and criterion-referenced grading attitude.

Table 19 presents the results of regression analysis of institution-oriented grading attitude using all the demographic variables as predictors.

The correlation coefficients indicated that number of years of college teaching, academic rank, and degree were correlated with institution-oriented grading attitude.

The regression coefficient for number of years of college teaching

Table 19. Regression analysis of institution-oriented grading attitude

<u>Variable</u>	<u>Zero order correlation</u>	<u>Regression B</u>	<u>Coefficient beta</u>	<u>Standard error</u>	<u>t</u>
Sex	.152	.498	.184	.454	1.097
Years	.253**	.124**	.680	.031	4.001
Rank 1	.198*	.450	.153	.362	1.243
Rank 2	.128	.213	.092	.400	0.533
Rank 3	-.103	-.238	-.114	.356	-0.673
Degree	-.196*	-.796	-.247	.537	-1.482
Credits	-.070	.044	.268	.028	1.578
Courses	-.111	-.544	-.272	.340	-1.601
(Constant)		1.477			
	n = 194	R ² = .133**		F = 3.56	

* Significant at .05 level.

** Significant at .01 level.

was statistically significant. This suggested that there were differences among the instructors of different levels of number of years of college teaching regarding institution-oriented grading attitude.

The number of years of college teaching was treated as a categorical variable in multiple comparison. The categories, together with the number of instructors in each category, were as follows:

<u>Number of years of college teaching</u>	<u>n</u>
Five or less	69
More than five but less than fifteen	56
Fifteen or more	69

The Scheffé method did not reveal the difference ($p = .05$) in institution-oriented grading attitude among the instructors from three levels of number of years of college teaching. This might be because the reduction of the number of groups to only three groups resulted in less variation and, thus, the insignificance of the mean differences.

Test of Hypothesis 2

Since the factors of grading attitude had already been known from factor analysis, Hypothesis 2 can be reformulated for the sake of precision as follows:

Hypothesis 2.

- 2.1 There are no significant differences between male and female instructors regarding
 - 2.1.1 Traditionalistic grading attitude
 - 2.1.2 Eclectic grading attitude
 - 2.1.3 Institution-oriented grading attitude
 - 2.1.4 Student-oriented grading attitude
 - 2.1.5 Norm-referenced grading attitude
 - 2.1.6 Criterion-referenced grading attitude
 - 2.1.7 Motivation grading attitude
- 2.2 There are no significant differences among instructors of different levels of number of years of college teaching regarding
 - 2.2.1 Traditionalistic grading attitude
 - 2.2.2 Eclectic grading attitude
 - 2.2.3 Institution-oriented grading attitude
 - 2.2.4 Student-oriented grading attitude
 - 2.2.5 Norm-referenced grading attitude
 - 2.2.6 Criterion-referenced grading attitude
 - 2.2.7 Motivation grading attitude

- 2.3 There are no significant differences among instructors of different academic ranks regarding
 - 2.3.1 Traditionalistic grading attitude
 - 2.3.2 Eclectic grading attitude
 - 2.3.3 Institution-oriented grading attitude
 - 2.3.4 Student-oriented grading attitude
 - 2.3.5 Norm-referenced grading attitude
 - 2.3.6 Criterion-referenced grading attitude
 - 2.3.7 Motivation grading attitude
- 2.4 There are no significant differences between instructors with doctoral degree and instructors with master's degree regarding
 - 2.4.1 Traditionalistic grading attitude
 - 2.4.2 Eclectic grading attitude
 - 2.4.3 Institution-oriented grading attitude
 - 2.4.4 Student-oriented grading attitude
 - 2.4.5 Norm-referenced grading attitude
 - 2.4.6 Criterion-referenced grading attitude
 - 2.4.7 Motivation grading attitude
- 2.5 There are no significant differences among instructors with different levels of number of college credits of educational evaluation completed regarding
 - 2.5.1 Traditionalistic grading attitude
 - 2.5.2 Eclectic grading attitude
 - 2.5.3 Institution-oriented grading attitude
 - 2.5.4 Student-oriented grading attitude
 - 2.5.5 Norm-referenced grading attitude
 - 2.5.6 Criterion-referenced grading attitude
 - 2.5.7 Motivation grading attitude
- 2.6 There are no significant differences between instructors who teach theoretical courses and instructors who teach laboratory courses regarding
 - 2.6.1 Traditionalistic grading attitude
 - 2.6.2 Eclectic grading attitude
 - 2.6.3 Institution-oriented grading attitude
 - 2.6.4 Student-oriented grading attitude
 - 2.6.5 Norm-referenced grading attitude
 - 2.6.6 Criterion-referenced grading attitude
 - 2.6.7 Motivation grading attitude

Invoking the results from regression analysis, the investigator rejected hypotheses 2.3.4, 2.3.5, 2.3.6, 2.4.4, 2.4.6, and 2.5.6. All other hypotheses were retained.

Test of Hypothesis 3

Since the factors of grading attitude had already been known from factor analysis, hypothesis 3 can be reformulated as follows:

Hypothesis 3: There is no linear relationship between sex, number of years of college teaching, academic rank, highest education degree attained, number of college credits of educational evaluation completed, and type of courses taught as predictors and each of the following factors as criterion:

- 3.1 Traditionalistic grading attitude
- 3.2 Eclectic grading attitude
- 3.3 Institution-oriented grading attitude
- 3.4 Student-oriented grading attitude
- 3.5 Norm-referenced grading attitude
- 3.6 Criterion-referenced grading attitude
- 3.7 Motivation grading attitude

Invoking the results from regression analyses, the investigator rejected hypotheses 3.3, 3.4, 3.5, 3.6 and 3.7 and retained hypotheses 3.1 and 3.2.

CHAPTER V. SUMMARY AND CONCLUSIONS

The final chapter of this study includes (1) a summarization of the purposes and the findings, (2) conclusions and implications, and (3) recommendations for further study.

Summary

The purposes of this study were to investigate the factor structure and the relationships among the factors of grading attitude of industrial education instructors from midwestern state universities and to compare the factors of the grading attitude of the industrial education instructors who differed in sex, number of years of college teaching, academic rank, highest education degree attained, number of college credits of educational evaluation completed, and type of courses taught. The need for research in this area was discussed in the introductory chapter. Many educationists involved in grading had found difficulties in grading practices due to their inconsistencies and discrepancies. It was suggested that one of the variables which played an important role in grading practices and gave rise to many of the difficulties was the grading attitude of the instructors (Van Dyke, 1969; O'Bryan, 1973; Murray, 1981). The instructor's grading attitude was postulated to have three groups of factors: (1) philos-

ophy of grading with its three factors, namely, traditionalism, eclecticism, and relativism (Dressel, 1961), (2) purpose of grading with its three factors, namely, institution-oriented, instruction-oriented, and student-oriented (Ericson, 1967), and (3) method of grading with norm-referenced, criterion-referenced, and motivation methods as its three factors (Terwilliger, 1971). These postulates had been widely used from their inception. It was the belief of the investigator that in order to solve any problem one must necessarily understand the problem fully and to understand the problem more fully means to understand its inner structure. Therefore, the investigator set out to test the postulates concerning the structure of the grading attitude of the instructors together with a study of related issues. In fact, this study sought to answer the following questions: (1) Is the grading attitude truly composed of three groups of factors as some educationists postulated?; (2) What are the relationships among the factors?; (3) Are there any differences among the instructors of different levels of demographic variables such as sex, number of years of college teaching, academic rank, highest educational degree attained, number of college credits of educational evaluation completed, and type of courses taught regarding the factors of the grading attitude?; and (4) Are there any relationships between the demographic variables of the instructors and the factors of the grading attitude and, if so, how can one predict the attitude toward grading from the knowledge of the instructor's demographic variables?

Two hundred and sixty questionnaires asking about the grading attitude were sent to the industrial education instructors from the midwestern state universities. One hundred and ninety four questionnaires or 74.6 percent were obtained.

The data obtained were analyzed to answer the above questions. The null hypotheses were tested using factor analysis and regression analysis.

The findings of this study may be summarized as follows:

1. The grading attitude of the industrial education instructors from the midwestern state universities had three groups of factors, namely, philosophy of grading, purpose of grading, and method of grading.
2. Philosophy of grading had only two factors: traditionalism and eclecticism.
3. Purpose of grading had only two factors: institution-oriented and student-oriented.
4. Method of grading had three factors: norm-referenced, criterion-referenced, and motivation.
5. There were no significant relationships among the factors of the grading attitude.
6. There were significant differences among the instructors with different academic ranks regarding the student-oriented, norm-referenced, and criterion-referenced grading attitudes. The instructors had better attitude toward student-oriented

purpose of grading and norm-referenced method of grading than the instructors of higher academic ranks. The professors preferred criterion-referenced grading method more than the instructors of other academic ranks.

7. There were significant differences between the instructors with doctoral and master's degrees regarding the grading attitude. The instructors with master's degrees were more student-oriented in grading. The instructors with doctoral degrees preferred criterion-referenced grading method more than the instructors with master's degrees.
8. There was a significant difference between the instructors who had completed six or less than six credits of educational evaluation and the instructors who had completed more than six but less than twelve credits of educational evaluation regarding the criterion-referenced grading attitude. The instructors who had completed more than six but less than twelve credits of educational evaluation preferred criterion-referenced grading more than the instructors who had completed six or less than six credits of educational evaluation.
9. There were linear relationships between all demographic variables in the study and every factor of the grading attitude except traditionalistic and eclectic grading attitudes.

Conclusion and Implications

It may be concluded that the grading attitude of the industrial education instructors at midwestern state universities had three groups of factors, namely, philosophy of grading, purpose of grading, and method of grading but with different factor structures from those postulated by Dressel, Ericson, and Terwilliger because it was found that both grading philosophy and grading purpose had only two factors each. The reason for the missing of relativistic grading philosophy may be that the philosophy was too extreme in the opinion of the industrial education instructors. Grading may result in many serious problems but it has always been necessary. The fact that most people, even the students who received bad grades, were not ready to throw away grading suggested that it had far more advantages than disadvantages (Sparks, 1969; Feldmesser, 1972; McKeachie, 1976). Beside being a good communication device, grading also served as a reinforcement/motivation and as a prediction/selection process. Therefore, the relativistic grading philosophy, which advocated self-evaluation and the abandonment of instructor's evaluation altogether, simply did not exist in the industrial education instructor's point of view.

As to the missing of the instruction-oriented purpose of grading, a possible explanation is that this study was done with the instructors. As Sparks (1969) pointed out, most instructors usually forgot that the more important and reasonable functions of grading were concerned with

instruction rather than learning or administration. The instructors should consider grades as a feedback about their teaching effectiveness and should use them as a basis for the improvement of various instructional and counseling programs. Unfortunately, general practices indicated that this function of grading had usually been neglected. In particular, students were assumed to know that "these grades were for you and you only" (Stallings, 1970). However, the investigator doubted that if this study had been done with the students instead of with the instructors, the instruction-oriented purpose of grading would have appeared as a factor of grading attitude.

Results of the study also indicated that there were no correlations among the factors of the grading attitude. This is contrary to what it should have been because at least philosophy, purpose, and method of any system should be correlated (Dressel, 1961). Man's objectives should be based on what he believes and his action; in turn, should directly follow his objectives. We know from the results of this study, however, that this was not always the case. The independence of each factor of the grading attitude suggested that in practice the grading processes were not at all consistent. The instructors might personally believe in one philosophy but may have to serve purposes contradictory to their belief. For example, they might support Eclecticism which allowed student's participation in evaluation but had to evaluate students all alone by themselves to serve the institutional purpose of maintenance of academic standards. Or they might

prefer instruction-oriented purposes which called for criterion-referenced type of grading method but may have to use norm-referenced grading method because that was the only grading method they knew or that was the most widely-used method at that particular time.

Results of the study revealed the differences among the industrial education instructors of different academic ranks regarding the student-oriented, norm-referenced, and criterion-referenced grading attitudes. It appeared that in educational evaluation the professors were more strict than the instructors of other academic ranks. As the results showed, the professors preferred criterion-referenced grading attitude more than the instructors of other academic ranks, while the instructors were more student-oriented and preferred norm-referenced grading method more than instructors of higher academic ranks. This may be because the professors assumed more authority on or mastery of the subject and, hence, were more subject matter-oriented.

It can also be concluded that the instructors with doctoral degrees were more "criterion-referenced" than the instructors with master's degrees while the instructors with master's degrees were more student-oriented. The reason for this should be similar to the one for the differences among the instructors of different academic ranks.

It was found that all the demographic variables together were linearly correlated with each of the factors of the grading attitude except traditionalistic and eclectic grading attitude. This may be

because of the complexity of each philosophy of grading. It is usually difficult for the instructors who were not conversant with educational philosophies to distinguish between one grading philosophy from the other.

Recommendations for Future Research

Based on the findings of this study, the following observations and suggestions for future research are presented.

1. There should be an in-depth study of each of the factors of grading and grading attitude. The study should take all the major foundations of education into account. These foundations include philosophy, psychology, socio-economics, and technology. Such a study will help clarify the concept of grading as a whole.

2. If similar research is to be conducted, the researcher should try to include more variables in the study. Also, he or she should use other types of measurement tools, e.g., Likert scale with different point-scale or Osgood's semantic differential scale. It is also possible to postulate other sets of hypotheses about the number of factors of grading attitude or about the nature of the factors themselves.

3. It would be interesting to determine whether grading attitude, grading practices, and grading systems are correlated. The last of these,

namely, grading systems, are, without doubt, much discussed currently in higher educational institutions.

4. Similar research, with an improvement of design and analysis, can also be done with other populations, such as faculty members in areas other than industrial education, or with students in different fields of study.

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APPENDIX A: COVER LETTER AND QUESTIONNAIRE

IOWA STATE UNIVERSITY

College of Education
Professional Studies
N243 Quadrangle
Ames, Iowa 50011

Telephone 515-294-4143

August 5, 1982

Dear Industrial Education Instructor:

As an industrial education instructor in a midwestern university, you have been randomly selected to participate in a study of grading attitude. The purpose of the questionnaire is to collect information for use in the research study which is in partial fulfillment of the requirements of my doctoral degree.

Your responses to the enclosed questionnaire are a crucial part of the project. Its accuracy is entirely dependent upon your willingness to answer the questions. The form includes questions on your attitude toward grading and your background.

Your answer will be held in the strictest confidence. This commitment is assured. I am interested only in the total distribution of the responses and in statistical relationship, and will under no circumstances report your responses on an individual or institutional basis.

It is hoped that you will find the questionnaire interesting to answer, and that you will return it in the enclosed stamped, and self-addressed envelope by August 25. I will welcome any comments you might make, and will attempt to answer any questions you might choose to ask. Therefore, please feel free to write to me at the above address or contact me directly at the following address:

Anusorn Skulkhu
755 Pamela Court
Ames, Iowa 50010 Ph. 515-292-5496

Thank you for your help.

Sincerely yours,



(Anusorn Skulkhu)

Part II

For each of the following statements, please indicate your degree of agreement by circling only one appropriate numeral in the response column:

1 means strongly disagree

2 means disagree

3 means slightly disagree

4 means neither agree nor disagree

5 means slightly agree

6 means agree

7 means strongly agree

- | | | |
|----|---|---------------|
| 1. | The major purpose of education is to transmit certain elements of cultural heritage whose importance is so great that they cannot be neglected. | 1 2 3 4 5 6 7 |
| 2. | The primary function of an instructor is to inform the student directly about subject matter. | 1 2 3 4 5 6 7 |
| 3. | The instructor should be solely responsible for the determination of course objectives since s/he knows best what the student should learn. | 1 2 3 4 5 6 7 |
| 4. | The instructor is the best judge of the student level of performance and the judgment should be allowed to be subjective. | 1 2 3 4 5 6 7 |
| 5. | Students should be graded primarily on the basis of their mastery of a body of subject matter. | 1 2 3 4 5 6 7 |
| 6. | Education is a continuing reconstruction of experience; that the process and the goal of education are one and the same thing. | 1 2 3 4 5 6 7 |

7. The primary function of an instructor is to provide certain learning activities from which the student acquires physical and intellectual skills. 1 2 3 4 5 6 7
8. It is important that students help their instructor in determining the objectives for the course of study. 1 2 3 4 5 6 7
9. Students should be allowed to help determine the standards that could provide bases for course grading. 1 2 3 4 5 6 7
10. Knowledge of the core of subject matters is less important than the experience derived from direct contact with contemporary society or social situations in which one lives. 1 2 3 4 5 6 7
11. The primary function of education is to help develop students' general ability so that they will be able to solve their future problems. 1 2 3 4 5 6 7
12. It is important that the instructor does not inculcate in the student what the instructor believes to be true or considers to be of value but should encourage the student to seek his or her own truth and values. 1 2 3 4 5 6 7
13. Grades do not adequately reflect a student's ability. 1 2 3 4 5 6 7
14. Students should be encouraged to find their own standards and evaluate themselves. 1 2 3 4 5 6 7
15. We should do away with grading. 1 2 3 4 5 6 7
16. Grading is a valuable tool for the maintenance of academic standard of an institution. 1 2 3 4 5 6 7
17. Grades provide valuable information for the improvement of curriculum. 1 2 3 4 5 6 7

18. Grading is the most appropriate method of summarizing and reporting student's achievement. 1 2 3 4 5 6 7
19. Grades provide the best information as to whether a student will be successful in his or her further study. 1 2 3 4 5 6 7
20. Grades are useful devices for screening and selecting students for fellowship, awards, honors, employment, etc. 1 2 3 4 5 6 7
21. Grades can give the instructor valuable information about his or her teaching effectiveness. 1 2 3 4 5 6 7
22. Grades provide valuable information for the instructor to improve his or her student guidance. 1 2 3 4 5 6 7
23. Grades provide valuable information as to how to group students for class activities. 1 2 3 4 5 6 7
24. Grades provide valuable information for the improvement of instruction. 1 2 3 4 5 6 7
25. Grades provide valuable information for the instructor to develop special programs, projects, etc., to meet individual student's needs. 1 2 3 4 5 6 7
26. Grades provide useful information about student's progress. 1 2 3 4 5 6 7
27. Grades help students to improve their ability to assess their own work. 1 2 3 4 5 6 7
28. Grades help students to discover their own aptitudes. 1 2 3 4 5 6 7
29. Grades provide valuable information for the student in selecting his or her future career or specialization. 1 2 3 4 5 6 7
30. Grades provide valuable information for the student to improve his/her study habits. 1 2 3 4 5 6 7

31. Competition among students is highly motivating; grades should be assigned competitively to take advantage of this fact. 1 2 3 4 5 6 7
32. A test should be able to discriminate the students into high/low achieved groups. 1 2 3 4 5 6 7
33. A norm from a class is more reliable and justifiable as a standard for student evaluation than a pre-specified criterion. 1 2 3 4 5 6 7
34. Grades are meaningful only when they reflect a student's position relative to the class. 1 2 3 4 5 6 7
35. The instructor should not assign grades before s/he knows all students' scores. 1 2 3 4 5 6 7
36. Comprehensive examinations are appropriate for the evaluation of student achievement. 1 2 3 4 5 6 7
37. Student's performance should be judged against a pre-specified criterion. 1 2 3 4 5 6 7
38. A test need not be able to discriminate students but should cover every aspect of the course objectives. 1 2 3 4 5 6 7
39. A high grade should mean that a student has mastered some well-defined domain of knowledge. 1 2 3 4 5 6 7
40. Student should be encouraged to compete with his or her own past instead of competing with others. 1 2 3 4 5 6 7
41. Students, even in the same class, should not be judged by the same standards. 1 2 3 4 5 6 7

42. Gained score or student's progress is as important as obtained score or student's achievement level. 1 2 3 4 5 6 7
43. Each student background should also be considered in student evaluation. 1 2 3 4 5 6 7
44. Student's attendance and participation in class activities is one reasonable basis for grade assignment. 1 2 3 4 5 6 7
45. Sometimes the low achieving student should be given extra work to do to meet the standard. 1 2 3 4 5 6 7

APPENDIX B: RESULTS OF PRETEST DATA ANALYSIS

Higher group
Lower group

	n	Mean	Standard deviation	t
1. The major purpose of education is to transmit certain elements of cultural heritage whose importance is so great that they cannot be neglected.	$\frac{21}{20}$	$\frac{4.952}{3.950}$	$\frac{.669}{.945}$	3.96
2. The primary function of an instructor is to inform the student directly about subject matter.	$\frac{21}{20}$	$\frac{4.705}{3.460}$	$\frac{.625}{.826}$	5.46
3. The instructor should be solely responsible for the determination of course objectives since s/he knows best what the student should learn.	$\frac{21}{20}$	$\frac{5.171}{3.901}$	$\frac{.870}{.788}$	4.89
4. The instructor is the best judge of the student level of performance and the judgment should be allowed to be subjective.	$\frac{21}{20}$	$\frac{5.192}{4.416}$	$\frac{.873}{.616}$	3.27
5. Students should be graded primarily on the basis of their mastery of a body of subject matter.	$\frac{21}{20}$	$\frac{5.033}{4.400}$	$\frac{.730}{.858}$	2.55

Coefficient alpha for Section I (Items 1-5) = .885.

6. Education is a continuing reconstruction of experience; that the process and the goal of education are one and the same thing.	$\frac{17}{19}$	$\frac{5.103}{3.707}$	$\frac{.666}{.725}$	5.99
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		<u>Higher group</u>			
		<u>Lower group</u>			
		<u>n</u>	<u>Mean</u>	<u>Standard deviation</u>	<u>t</u>
7.	The primary function of an instructor is to provide certain learning activities from which the student acquires physical and intellectual skills.	<u>17</u> <u>19</u>	<u>4.826</u> <u>3.856</u>	<u>.717</u> <u>.807</u>	3.79
8.	It is important that students help their instructor in determining the objectives for the course of study.	<u>17</u> <u>19</u>	<u>5.518</u> <u>3.708</u>	<u>.892</u> <u>.633</u>	7.08
9.	Students should be allowed to help determine the standards that could provide bases for course grading.	<u>17</u> <u>19</u>	<u>5.029</u> <u>3.834</u>	<u>.659</u> <u>.629</u>	5.57
10.	Knowledge of the core of subject matters is less important than the experience derived from direct contact with contemporary society or social situations in which one lives.	<u>17</u> <u>19</u>	<u>5.015</u> <u>4.100</u>	<u>.546</u> <u>.873</u>	3.72

Coefficient alpha for Section II (Items 6-10) = .643.

11.	The primary function of education is to help develop students' general ability so that they will be able to solve their future problems.	<u>18</u> <u>20</u>	<u>5.074</u> <u>3.923</u>	<u>.714</u> <u>.803</u>	4.65
12.	It is important that the instructor does not inculcate in the student what the instructor believes to be true or considers to be of value but should encourage the student to seek his or her own truth and values.	<u>18</u> <u>20</u>	<u>5.142</u> <u>4.004</u>	<u>.884</u> <u>.734</u>	4.34

		<u>Higher group</u>		<u>Lower group</u>		
		<u>n</u>	<u>Mean</u>	<u>Standard deviation</u>	<u>t</u>	
13.	Grades do not adequately reflect a student's ability.	<u>18</u>	<u>5.269</u>	<u>.783</u>	7.06	
		<u>20</u>	<u>3.645</u>	<u>.634</u>		
14.	Students should be encouraged to find their own standards and evaluate themselves.	<u>18</u>	<u>5.221</u>	<u>.614</u>	7.79	
		<u>20</u>	<u>3.637</u>	<u>.636</u>		
15.	We should do away with grading.	<u>18</u>	<u>5.285</u>	<u>.729</u>	2.71	
		<u>20</u>	<u>4.654</u>	<u>.704</u>		

Coefficient alpha for Section III (Items 11-15) = .797.

16.	Grading is a valuable tool for the maintenance of academic standard of an institution.	<u>17</u>	<u>4.839</u>	<u>.638</u>	4.15	
17.	Grades provide valuable information for the improvement of curriculum.	<u>17</u>	<u>5.252</u>	<u>.791</u>	5.02	
		<u>18</u>	<u>4.058</u>	<u>.610</u>		
18.	Grading is the most appropriate method of summarizing and reporting student's achievement.	<u>17</u>	<u>5.104</u>	<u>.736</u>	5.51	
		<u>18</u>	<u>3.637</u>	<u>.834</u>		
19.	Grades provide the best information as to whether a student will be successful in his or her further study.	<u>17</u>	<u>5.134</u>	<u>.739</u>	8.12	
		<u>18</u>	<u>3.225</u>	<u>.652</u>		
20.	Grades are useful devices for screening and selecting students for fellowship, awards, honors, employment, etc.	<u>17</u>	<u>4.992</u>	<u>.877</u>	5.84	
		<u>18</u>	<u>3.354</u>	<u>.783</u>		

Coefficient alpha for Section IV (Items 16-20) = .871.

		<u>Higher group</u> <u>Lower group</u>			
		<u>n</u>	<u>Mean</u>	<u>Standard deviation</u>	<u>t</u>
21.	Grades can give the instructor valuable information about his or her teaching effectiveness.	$\frac{16}{18}$	$\frac{5.063}{3.776}$	$\frac{.695}{.618}$	5.64
22.	Grades provide valuable information for the instructor to improve his or her student guidance.	$\frac{16}{18}$	$\frac{5.124}{3.168}$	$\frac{1.204}{.938}$	5.32
23.	Grades provide valuable information as to how to group students for class activities.	$\frac{16}{18}$	$\frac{4.831}{3.603}$	$\frac{.784}{.667}$	4.96
24.	Grades provide valuable information for the improvement of instruction.	$\frac{16}{18}$	$\frac{4.938}{4.000}$	$\frac{.880}{.840}$	3.18
25.	Grades provide valuable information for the instructor to develop special programs, projects, etc., to meet individual student's needs.	$\frac{16}{18}$	$\frac{5.050}{3.755}$	$\frac{.683}{.945}$	4.53

Coefficient alpha for Section V (Items 21-25) = .859.

26.	Grades provide useful information about student's progress.	$\frac{22}{17}$	$\frac{5.632}{4.969}$	$\frac{.684}{1.183}$	2.20
27.	Grades help students to improve their ability to assess their own work.	$\frac{22}{17}$	$\frac{4.526}{3.400}$	$\frac{.733}{.905}$	4.29
28.	Grades help students to discover their own aptitudes.	$\frac{22}{17}$	$\frac{5.087}{4.457}$	$\frac{.920}{.607}$	2.44

	<u>Higher group</u>		<u>Lower group</u>	
	n	Mean	Standard deviation	t
29. Grades provide valuable information for the student in selecting his or her future career or specialization.	$\frac{22}{17}$	$\frac{4.413}{3.565}$	$\frac{.716}{.714}$	3.67
30. Grades provide valuable information for the student to improve his/her study habits.	$\frac{22}{17}$	$\frac{5.278}{3.996}$	$\frac{.713}{.549}$	6.13

Coefficient alpha for Section VI (Items 26-30) = .838.

31. Competition among students is highly motivating; grades should be assigned competitively to take advantage of this fact.	$\frac{21}{19}$	$\frac{5.361}{3.896}$	$\frac{.784}{1.108}$	4.86
32. A test should be able to discriminate the students into high/low achieved groups.	$\frac{21}{19}$	$\frac{5.526}{3.700}$	$\frac{.713}{.995}$	6.72
33. A norm from a class is more reliable and justifiable as a standard for student evaluation than a pre-specified criterion.	$\frac{21}{19}$	$\frac{5.185}{4.357}$	$\frac{.619}{.703}$	3.96
34. Grades are meaningful only when they reflect a student's position relative to the class.	$\frac{21}{19}$	$\frac{5.528}{4.309}$	$\frac{.907}{.920}$	4.22
35. The instructor should not assign grades before s/he knows all students' scores.	$\frac{21}{19}$	$\frac{5.174}{3.903}$	$\frac{.912}{1.237}$	3.45

Coefficient alpha for Section VII (Items 31-35) = .748.

		<u>Higher group</u>			
		Lower group			
		n	Mean	Standard deviation	t
36.	Comprehensive examinations are appropriate for the evaluation of student achievement.	$\frac{19}{16}$	$\frac{5.609}{4.055}$	$\frac{.903}{.743}$	5.49
37.	Student's performance should be judged against a pre-specified criterion.	$\frac{19}{16}$	$\frac{5.380}{4.264}$	$\frac{.774}{.826}$	4.12
38.	A test need not be able to discriminate students but should cover every aspect of the course objectives.	$\frac{19}{16}$	$\frac{5.364}{4.023}$	$\frac{.838}{1.093}$	4.11
39.	A high grade should mean that a student has mastered some well-defined domain of knowledge.	$\frac{19}{16}$	$\frac{5.618}{4.770}$	$\frac{.833}{.954}$	2.81
40.	Student should be encouraged to compete with his or her own past instead of competing with others.	$\frac{19}{16}$	$\frac{5.556}{4.307}$	$\frac{.752}{.945}$	4.35

Coefficient alpha for Section VIII (Items 36-40) = .829.

41.	Students, even in the same class, should not be judged by the same standards.	$\frac{21}{19}$	$\frac{5.070}{3.836}$	$\frac{.843}{.808}$	4.72
42.	Gained score or student's progress is as important as obtained score or student's achievement level.	$\frac{21}{19}$	$\frac{5.195}{4.015}$	$\frac{.729}{.898}$	4.58
43.	Each student background should also be considered in student evaluation.	$\frac{21}{19}$	$\frac{5.253}{4.157}$	$\frac{.823}{.741}$	4.41

		<u>Higher group</u>	<u>Lower group</u>	
	<u>n</u>	<u>Mean</u>	<u>Standard deviation</u>	<u>t</u>
44. Student's attendance and participation in class activities is one reasonable basis for grade assignment.	$\frac{21}{19}$	$\frac{5.422}{4.079}$	$\frac{.911}{1.037}$	4.48
45. Sometimes the low achieving student should be given extra work to do to meet the standard.	$\frac{21}{19}$	$\frac{5.103}{3.780}$	$\frac{1.079}{.902}$	4.18

Coefficient alpha for Section IX (Items 41-45) = .806.