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An analysis of the career paths of ISU teacher education graduates utilizing a cross-validating discriminant analysis technique

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graduates utilizing a cross-validating discriminant analysis
technique**

Kumlung, Arunee, Ph.D.

Iowa State University, 1988

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An analysis of the career paths of ISU teacher education
graduates utilizing a cross-validating discriminant analysis
technique

by

Arunee Kumlung

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
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Ames, Iowa

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CHAPTER I. INTRODUCTION

Background

Teachers today are confronted with many serious issues that affect their professional lives, hence the teaching profession has become increasingly more stressful. Current day problems include teacher shortage, teacher quality, and teacher attrition. Consequently, concerns about the decline in the quality of education have been pointed out (National Commission on Excellence in Education, 1983). The educators who sought to improve the quality of education realized that it was necessary to turn to research studies on teacher retention. There were a number of studies that revealed evidence of a need to enhance teacher retention. For example, it was predicted that there would be a teacher shortage in the mid-1980s (Darling-Hammond, 1984; Feistritzer, 1984; Weaver, 1984; Musemeche & Adams, 1978). In addition, the Department of Education's Center for Statistics projected that, by 1993, the supply of new teacher graduates would be less than two-thirds (63 percent) of the demand (Feistritzer, 1986). Also noted, was that about sixty percent of the students in education programs considered that there were some nonteaching careers in which they could utilize their education skills (Watkins, 1981).

Parkay (1982) indicated that after a semester of student teaching, the attitudes of the student teachers deteriorated toward teaching as a career. According to Delatiner (1984), only fifteen percent of the qualified teaching candidates even applied for teaching positions. The academic ability or quality of those choosing to enter and remain in the teaching profession was declining (Weaver, 1984; Herman, 1978; Schlechty & Vance, 1981). Finally, student achievement or the learning environment was negatively affected by teacher turnover (Gupta, 1979; Bridge, Judd, & Moock, 1979; Katzman, 1971; Levin, 1970; Feters, Collins, & Smith, 1968; Burkhead, Fox, & Holland, 1967). Enhancing teacher retention can be guided by information about the factors that influence teacher education graduates to enter and remain in teaching profession. However, attempts to identify all the possible factors may be difficult.

In the review by Sweeney (1987), teacher retention had received only limited attention from educational researchers. However, some general understanding about teacher retention was discovered in the literature. She indicated that there was little agreement about the strength of the factors that influence teachers' decisions to enter and remain in teaching or the relationships between those factors. She also suggested that there was a need to

carefully define the term "retention" and to differentiate between teachers who were teaching by choice and those not teaching by choice. Sweeney felt that the types of research designs in use at that time were not appropriate. As a result, she stated that:

There is a need for research which identifies the variables that influence retention and systematically examines how variables influence retention, directly and indirectly; how these variables are interrelated; and which of these variables appear to be most salient for predicting retention. There is a need for a study that examines teacher retention using both a bivariate and a multiple variable approach.

Therefore, in a dissertation of development and testing of a longitudinal model called Career Path Model, Sweeney (1987) studied teacher retention to address the shortcomings of the previous research, and to examine the factors that influence the career paths of Iowa State University teacher education graduates. This model was not only used to help explain why teachers leave teaching, but also used to predict the career paths of the ISU teacher graduates.

This Career Path Model was longitudinal. It included three measurement points: graduation from the preparation program (Time 1), one year following graduation (Time 2), and five years following graduation (Time 3). At each of the three measurement points, Career Path Determinants were measured. These determinants consisted of variables within

the four major areas: (1) Personal and Background Characteristics, (2) Preparation Program Factors, (3) Employment Factors, and (4) Indicators of Career Satisfaction. Seventeen variables were examined to find out whether they influenced the One Year Career Path. These variables were labeled: gender, grade point average, high school rank, marital status, satisfaction with cooperating teacher, self-evaluation as a teacher, perceived adequacy of preparation in planning and delivering instruction, perceived adequacy of preparation in interpersonal relations, perceived adequacy of preparation in student motivation and discipline, perceived adequacy of preparation in preparing and using instructional media, perceived adequacy of preparation in assessing and implementing innovations, employment expectations in money, prestige, advancement, employment expectations in leadership and responsibility, employment expectations in power, teaching certification level, choose teaching again, and satisfaction with student teaching. One Year Career Path, as the dependent variable, was classified into four groups: (1) those who planned to enter teaching and did (Teach/Teach); (2) those who planned to enter teaching but did not teach (Teach/Not Teach); (3) those who did not plan to enter teaching but did teach (Not Teach/Teach); and (4) those who

did not plan to enter teaching and did not teach (Not Teach/Not Teach). The data used in this Career Path were collected from the teacher education graduates at Time 1; at graduation from the ISU Teacher Preparation Program. The results of the discriminant analysis revealed that ten out of the seventeen variables were retained at the conclusion of the analysis. That is, these ten variables were statistically identified as the best predictors and used to predict the group membership of the graduate in one year following graduation.

Nineteen variables that might have influenced the Five Year Career Path were examined. Seven variables measured at the time of graduation were labeled: gender, grade point average, satisfaction with cooperating teacher, self-evaluation as a teacher, teaching certification level, satisfaction with student teaching, and intention to teach. The first six variables were also previously used in One Year Career Path analysis. Four variables were used in both One Year and Five Year Career Path analyses but were measured at the different point in time. They were: perceived adequacy of preparation in planning and delivering instruction, perceived adequacy of preparation in interpersonal relations, perceived adequacy of preparation in student motivation and discipline, and choose teaching

again. These variables as well as the other eight variables that were used in Sweeney's analysis were measured at one year following graduation. These eight variables were labeled: perceived adequacy of preparation in monitoring student achievement, perceived quality of preparation program, total income, employment dissonance in money, prestige, and advancement, employment dissonance in opportunity to use special abilities and aptitudes, employment dissonance in leadership and responsibility, employment dissonance in helping and serving others, and job satisfaction. Five Year Career Path, as the dependent variable, was also classified into four groups. These four groups consisted of teacher education graduates (1) who entered and left teaching; (2) who entered and stayed in teaching; (3) who taught intermittently; and (4) who never taught. The results from the discriminant analysis revealed that ten out of nineteen variables were retained as the best predictors and used to predict the group membership of the graduate five years following graduation.

Not only were the accuracies of the prediction relatively high, but the percentages of teacher education graduates correctly classified also exceeded the prior probabilities of correct classification. That is, both sets of the predictors for the One Year and Five Year Career Path

showed the abilities in accurately discriminating between teacher education graduates. Therefore, Sweeney's model was generally supported. However, the results from the cross-validation testing portion of the model suggested that some predictor variables were still in doubt.

Statement of the Problem

One of the tools that can help educators solve the problem of teacher retention is the Career Path Model. As mentioned earlier, this model was not only used to help explain why teachers leave teaching, but also used to predict the career paths of the ISU teacher graduates. In prediction situations, one is faced with two distinct goals. The first of these is the determination of the weights which will predict the criterion from the predictor information; the second is the most accurate determination of how effective the prediction will be. The Career Path Model was developed by using the discriminant analysis technique to reach these goals. The discriminant functions were given from the analysis to predict the career paths of the ISU teacher graduates in the sense that they were the linear combinations of the original predictor variables which revealed the large differences in group means. They theoretically predict the category or group that the subject will be in.

Even though it can be concluded that the Career Path Model is generally supported, there still is a doubt about the influence of some of the variables. Therefore, there was a definite need to do further study in order to determine the stability of the Career Path Model of ISU teacher education graduates.

Purpose of the Study

The purpose of this study was to cross-validate the results of Sweeney's study (1987) which suggested that the Career Path Model may be of potential value in discriminating or predicting one year and five years career paths of ISU teacher education graduates. Discriminant analysis was used in her study to do such predictions. When results of discriminant analysis are obtained, we still have these unanswered questions:

1. Is the existence of the discriminators stable?
2. How stable are the variables discriminating among the groups?
3. How stable are the percentages of the correctly classified cases?

Thus, the purposes of this study were:

1. to examine the stability of the variables selected for the model as well as the relative contribution of each variable.

2. to determine the stability of the utility of the discriminant functions and hence the Career Path Model across the samples.

Basic Assumption

Dillman's model of questionnaire design was adapted by the Research Institute for Studies in Education (RISE) to collect the data and the data were in the databank in RISE. It is therefore assumed that the instruments, procedures, and data collection methods used by RISE were reliable and valid.

Organization of the Study

The remainder of this study is composed of Chapter Two through Chapter Five. Chapter Two presents a review of relevant literature. It includes literature on the importance of cross-validation and literature on Career Path Models. Chapter Three contains the methodology for the study which presents the description of data source and instruments, population and samples, measurement of the variables, hypotheses to be tested, and statistical procedure utilized. The results of the data analysis are presented in Chapter Four. It includes the findings and interpretation of data. The final chapter, Chapter Five,

concludes this study with a summary, discussion, and recommendations.

CHAPTER II. REVIEW OF LITERATURE

Since the purpose of this study was to cross-validate the results of Sweeney's study in order to examine the stability of the prediction portions of the Career Path Model of ISU teacher education graduates, the literature of this model as well as the literature of the cross-validation must be reviewed.

The Career Path Model

Sweeney (1987) developed a Career Path Model in order to help explain why teachers leave teaching and to predict the career paths of the ISU teacher education graduates. This model was developed based on the career choice and the development theories of Super, Holland, and Krumboltz which were supported by several studies (e.g., Chapman and Hutchenson, 1982; Chapman, 1983a, 1983b, 1984; and Chapman and Lowther, 1982). In addition to these theories, the review of literature provided the rationale to conclude that the career path choice of ISU teacher education graduates were a result of the influence of the personal and background characteristics, preparation program factors, employment factors, and indicators of career satisfaction which were called Career Path Determinants. The model was separated into two predictive portions which predicted the

One Year and Five Year Career Path. The one year career path choice of ISU teacher education graduates can be predicted by the Career Path Determinants measured at the time of graduation while the career path choice at five years following graduation can be predicted by a combination of factors measured at the time of graduation and one year following graduation.

According to the review of Sweeney, seventeen variables from the four areas of Career Path Determinants were combined to examine the One Year Career Path portion. Using stepwise discriminant analysis with a sample of 246 1980/1981 academic year ISU teacher education graduates, she found that ten out of the seventeen variables effected the choice of the One Year Career Path. These ten variables are presented in Table 1. Using this model, almost seventy-one percent (70.92%) of the teacher education graduates were correctly classified or predicted.

Similarly, the results from the stepwise discriminant analysis revealed that ten out of nineteen Career Path Determinant variables influenced the choice of the Five Year Career Path. They are presented in Table 2. Using the model, over sixty percent (61.58%) of the teacher education graduates were correctly classified or predicted.

TABLE 1. Summary of variables remaining at conclusion of discriminant analysis of the One Year Career Path group

Career Path Determinant area/ Variables	Step entered into analysis
Personal and Background Characteristics	
Marital status	5
GPA (combined admission and graduation)	4
HSR	6
Preparation Program Factors	
Self-evaluation as a teacher	7
Employment Factors	
Employment expectations in money, prestige, and advancement	10
Employment expectations in leadership and responsibility	2
Employment expectations in power	3
Teaching certification level	8
Indicators of Career Satisfaction	
Choose teaching again	9
Satisfaction with student teaching	1

TABLE 2. Summary of variables remaining at conclusion of discriminant analysis of the Five Year Career Path group

Career Path Determinant area/ Variables	Step entered into analysis
Preparation Program Factors	
Self-evaluation as a teacher	6
Perceived adequacy of preparation in student motivation and discipline	4
Perceived adequacy of preparation in planning and delivering instruction	8
Perceived quality of preparation program	7
Employment Factors	
Total income	5
Employment dissonance in money, prestige, and advancement	9
Employment dissonance in leadership and responsibility	10
Employment dissonance in opportunity to use special abilities and aptitudes	3
Indicators of Career Satisfaction	
Satisfaction with student teaching	2
Intention to teach	1

A second sample was used to cross-validate the testing of the portion of the model that predicted the One Year Career Path. This sample comprised 179 1982/1983 academic year ISU teacher education graduates. Sweeney used the term "cross-validation" in the same meaning as "replication". That is, ten variables from the result of the initial testing with the first sample were used in the discriminant analysis. Based on the stepwise method, six of the ten variables remained at the conclusion of the analysis, as shown in Table 3. The accuracy of prediction of course declined.

Cross-validation

In the situation that can be viewed as a prediction problem, the determination of the weights and the effectiveness of the prediction equation are distinct goals and should be interpreted with caution, particularly when they have not been cross-validated (Pedhazur, 1973). The point is that neither the optimal weights nor the effectiveness of prediction in the sample "at hand" is interesting. As we already have criterion measurement for the sample cases, why should we predict the criterion scores for them? The interest in the sample; therefore, is to determine the weights and effectiveness which will most

TABLE 3. Summary of variables remaining at conclusion of cross-validating discriminant analysis of the One Year Career Path group

Career Path Determinant area/ Variables	Step entered into analysis
Personal and Background Characteristics	
Marital status	5
GPA (combined admission and graduation)	4
HSR	2
Preparation Program Factors	
Self-evaluation as a teacher	6
Employment Factors	
Teaching certification level	3
Indicators of Career Satisfaction	
Satisfaction with student teaching	1

likely apply in other samples for which criterion measures are not or will not be available. Unfortunately, the prediction equation based on a particular sample will not work as well when applied to a new sample as it did for the sample on which it was developed (Cureton, 1950). This kind of effect is called sample-specific covariation (Thorndike,

1978). The question is, how well the prediction equation will predict for a new group? The cross-validation approach has been recommended for coping with this problem. For example, Cureton (1950) stated that no confidence can be placed in a set of weights unless they have been shown to yield accurate prediction in cross-validation. Mosier (1951), Thorndike (1978), and Anastasi (1979) suggested that when a set of predictors has been selected from the statistics of one sample, the validity of the set as a whole should be checked in a new sample. McNemar (1969) also stated that "when predictors have been chosen because they show promise for a sample at hand, it is imperative that we proceed to a second sample in order to secure more dependable estimate of the predictive worth of the selected variables".

Moreover, a number of studies agreed that cross-validation is required before any attempt at interpretation of variates can be made (Lykken, 1968; Thorndike, Weiss, and Dawis, 1968; Herzberg, 1969; Thorndike and Weiss, 1973; and Bornstein, 1983). However, Murphy (1983) reported that during the 1976-1981 era almost 59% of the predictive studies reported no apparent attempts at cross-validation.

Some authors used the terms "replication" and "cross-validation" interchangeably. For example, Borg and Gall (1983) defined the replication as:

the process of repeating a research study with a different group of subjects using the same or similar methods. Results of a study are more "significant"--in the sense of inspiring confidence that they represent differences or relationships in the population--if a new study yields similar results, or if the present study repeats the findings of past research.

However, many authors reserved the term "replication" for the meaning of repeated measurement used in the experimental design in which measurements are repeated a number of times on the same subjects. They used the term "cross-validation" in the same way as "replication" defined by Borg and Gall. For example, Mosier (1951), McNemar (1969), Ferguson (1976), Anastasi (1979), and Brown (1983) defined cross-validation as the process of checking the validity of the relationships between criterion and predictors by repeating the validation process on another sample similar to the original sample, preferably another sample randomly drawn from the same population. According to Thorndike (1978), the original sample is called the development sample while the other called the cross-validation sample.

To carry out a cross-validation study it is necessary to have predictor and criterion information on the cross-validation sample as well as on the development sample. After a set of predictors from the statistics for the development sample is determined, the cross-validation of this finding on the cross-validation sample is carried out.

Then some criteria must be applied to determine the validity of the results. Since the approach to the prediction problems can be provided by many analyses such as (multiple) regression analysis, canonical analysis, and discriminant analysis, such criteria are subject to the analysis approached.

The approach to the problem in this study will be discriminant analysis. Thus, cross-validating discriminant analysis was of interest. Similar to any approach to the prediction problem, the relative variable contribution in discriminant analysis is of primary concern. The problem is to determine which index of relative variable contribution in discriminant analysis is stable and can thus be used as a criterion in cross-validation. Traditionally, the index used to determine such contribution is the standardized discriminant function coefficients or weights (Tatsuoka, 1973). Two correlations have been also proposed for this purpose. One is the total group estimate of the correlations between each of the predictors and each of the discriminant functions (Cooley and Lohnes, 1985). The other is the within-groups estimate of the correlations between each of the predictors and each of the discriminant functions (Bargmann, 1970).

According to Klecka (1980), the standardized discriminant function coefficients or weights are the measure of the variable's importance. Each coefficient represents the relative contribution of its associated variable to the function. While the standardized coefficients take into consideration the simultaneous contributions of all variables, the correlations between each of the predictors and each of the discriminant functions are not affected by relationships with the other variables. That is, they are the simple bivariate correlations which tell how closely a variable and a function are related. When the magnitude of the correlation is very large, the function carries nearly the same information as the variable. The two types of correlation as proposed earlier, therefore, are useful for identifying the kind of information carried by the function which is useful for discriminating between and within groups. They are sometimes referred to as total structure coefficients and within-groups structure coefficients, respectively.

A number of studies had contradictory results and suggestions about the index of relative variable contribution in discriminant analysis. For example, Huberty (1975b) conducted an empirical study to investigate the stability of these three indices of relative predictor

variable potency. Under a situation in which only the first function was evaluated, Huberty concluded that given a single run of the experiment, none of the indices was sufficiently reliable in identifying potent variables unless the total sample size was very large. Barcikowski and Stevens (1975) concluded in their empirical study of the stability of canonical correlations, canonical weights and canonical variate-variable correlations that the canonical variate-variable correlations were not superior to the weights, at least not in terms of being more reliable. However, Meredith (1964) and Borgen and Seling (1978) had the same conclusion in their studies that the weights were not a secure basis for interpreting the relationships of the original variables and criterion because the intercorrelations among the variables may affect the weights so that they do not directly reflect such relationships. They also agreed that the correlations between the original predictors and the discriminant functions were more directly interpretable. In the investigation that involved two sets of real data, Thorndike and Weiss (1973) reached the same conclusion of the stability of the correlations. Among many authors, Klecka (1980) suggested that the correlations are a better guide to the meaning of the canonical discriminant functions than the standardized coefficients. Nevertheless, Tatsuoka (1973) stated that such correlations were not

intended as measures of potency of discrimination, but as aids in interpretation of the resulting discriminant functions. Darlington, Weinberg, and Walberg (1973) did not take quite such a strong position. They stated that:

the theoretical advantages of the two types of statistic (weights and correlations) have not been adequately explicated. A detailed analysis would probably show that the correlations are theoretically preferable in some situations and the weights in others.

They also recommended that when the variables were highly intercorrelated, the correlations should be emphasized, at least for small- or medium-sized samples because they would have less sampling error.

The size of the sample was also mentioned in the study of Barcikoski and Stevens. They stated that sufficient sample size was also needed to ensure that the relationship is stable and that the interpretation of the variates is the same. Furthermore, they recommended that if one cannot obtain a large number of subjects per variable, do the cross-validation to see if the relationship holds up. Then compute the canonical correlations for each sample, and just use them for interpretation.

According to Klecka (1980) the accuracy of the procedure can be indicated by the proportion of cases correctly classified. Therefore, the result of classification analysis can be used as one of the indicators of the stability of the model.

Summary

In summary, most of the situations have two or more variables sharing the same discriminating information (i.e., they are highly correlated) even though they are individually good discriminators. Although some variables may be good discriminators on their own, they are redundant when other variables are employed in the analysis. They do not contribute to the analysis because their unique contributions are insufficient.

A stepwise procedure can be used in discriminant analysis situations like this to select the most useful discriminating variable. As explained in the book written by Klecka (1980), the procedure begins by selecting the individual variable which provides the greatest univariate discrimination. The procedure then pairs this first variable with each of the remaining variables, one at a time, to locate the combination which produces the greatest discrimination. The variable which contributed to the best pair is selected. The procedure continues to combine the first two with each of the remaining variables to form triplets. The best triplet determines the third variable to be entered. This procedure of selecting variables on the basis of the one which adds the most discrimination to those already selected continues until possible variables have

been selected or the remaining variables do not contribute a sufficient increment. With the stepwise procedure, variables may be removed as additional variables are entered. All variables must satisfy the partial F values criterion before they can be entered or removed. This F value measures the variable's discriminating power shared with other variables. Consequently, by using the stepwise discriminant analysis procedure, the step entered into the analysis can be used to obtain the rank order of the unique discriminating power carried by each of the selected variables. However, the sequence in which variables are selected does not necessarily coincide with their relative importance. An important discriminator may be selected late or not at all, because of intercorrelation, its unique contributions are not as great as those of other variables.

All the discriminators selected by the stepwise procedure then determine the discriminant functions used to classify cases into group membership. That is, discriminant analysis is also a classification technique. This technique is not used only to classify group membership but also to test the adequacy of the discriminant functions derived from the selected variables. In the manner of the success in discrimination can be measured by observing the proportion of correct classifications.

As a conclusion from the review of literature, it was decided that the discriminant function coefficients will be used to interpret the relative contributions of the variables and then to compare the interpretations across the samples. The proportion of correct classifications will be employed to examine the adequacy of the discriminant functions derived from the discriminators.

CHAPTER III. METHODOLOGY

The primary objectives of this study were to determine the stability of the relationships between Career Path groups. A cross-validating discriminant analysis was used to study these objectives. This section will discuss this analysis as well as the data source and instruments, population and samples, measurement of variables, and empirical hypotheses.

Data Source and Instruments

This study utilized data collected by the Research Institute for Studies in Education (RISE) at Iowa State University. This data are longitudinal and have been in RISE databank. RISE gathered data from surveys at three points in time with three different questionnaires. "Teacher Education Program Graduate Survey Questionnaire" was used at the time of graduation (Time 1), "One-Year Follow-up Teacher Education Graduate Survey Questionnaire" at one year following graduation (Time 2), and "Five-Year Follow-up Teacher Education Graduate Survey Questionnaire" at five years following graduation (Time 3). These questionnaires are presented in Appendix B. The data were retrieved by RISE personnel to provide the information for this study. They included the variables shown in Table 4.

TABLE 4. The variables in this study classified by measurement time

Variable	Measurement time
<u>Dependent variables</u>	
1. Current employment	Time 2
2. Intention to teach or Employment plans after graduation	Time 1
3. Employment patterns	Time 3
<u>Independent variables or Career path determinants characteristics</u>	
1. Gender	Permanent record cards
2. Marital status	Time 1
3. Academic ability/achievement	
Grade point average	Times 1, 2
High school rank	Permanent record cards
<u>Preparation program factors</u>	
1. Student teaching	
Perceived satisfaction with cooperating teacher	Time 1

Table 4. continued

Variable	Measurement time
2. Sense of efficacy	
Self-evaluation as a teacher	Time 1
Perceived adequacy of preparation in:	
planning and delivering instruction	Times 1, 2
interpersonal relations	Times 1, 2
student motivation and discipline	Times 1, 2
preparing and using instructional media	Time 1
assessing and implementing innovation	Time 1
monitoring student achievement	Time 2
3. Perceived quality of preparation program	Time 2
<u>Employment factors</u>	
1. Employment expectations	
Money, prestige, and advancement	Time 1
Leadership and responsibility	Time 1
Power	Time 1
2. Employment dissonance	
Money, prestige, and advancement	Time 2
Opportunity to use special ability and aptitudes	Time 2

Table 4. continued

Variable	Measurement time
Leadership and responsibility	Time 2
Helping and serving others	Time 2
3. Salary	
Total income	Time 2
4. Teaching level	Time 1
<u>Indicators of career satisfaction</u>	
1. Choose teaching again	Times 1, 2
2. Satisfaction with student teaching	Times 1, 2
3. Intention to teach	Time 2
4. Job satisfaction	Time 2

Population and Samples

The population for this study consisted of all the ISU teacher education graduates who graduated from Spring Quarter, 1980 through Spring Semester, 1982. The subjects from this population who graduated from Fall Semester, 1981 through Spring Semester, 1982 were selected to be a sample used to serve the purpose of this study. The purpose of this study was to cross-validate the results of Sweeney's study in order to determine the stability of the

relationships between Career Path groups and Career Path Determinants across the samples of ISU teacher education graduates. Therefore, this selected sample was treated as the cross-validation sample while the sample in Sweeney's study was the development sample. In summary, two samples were involved in this study.

1. Sample One was the sample in Sweeney's study. It comprised 246 ISU teacher education graduates from Spring Quarter, 1980 through Spring Semester, 1981. They participated in all three of the surveys conducted at the time of graduation, one year following graduation, and five years following graduation.
2. Sample Two consisted 154 ISU teacher education graduates from Fall Semester, 1981 through Spring Semester, 1982. They participated in all three of the surveys conducted at the three points in time.

Measures

The measurement of both dependent and independent variables in this study was relevant to the measurement in Sweeney's study. Some variables had to be recoded to form in the same fashion as in her study.

The variables in four major factors of independent variables were studied to determine the stability of their influence upon the One Year and Five Year Career Path of ISU teacher education graduates. According to the review by Sweeney, these variables had the potential to influence the Career Path of ISU teacher education graduates. Since the measurement of these variables in sample one has been described in Sweeney's dissertation, the measurement of these variables in sample two will only be presented.

Dependent variables

One Year Career Path The variables "employment plans after graduation" from Time 1 and "current employment" from Time 2 were used to classify One Year Career Path into four mutually exclusive groups. As defined by Sweeney, these four groups are:

Teach/Teach

Those who reported at the time of graduation that they planned to enter teaching the academic year following graduation and did teach the academic year following graduation;

Teach/Not teach

Those who reported at the time of graduation that they planned to enter teaching the academic year following graduation, but did not teach the academic year following graduation;

Not teach/Teach	Those who reported at the time of graduation that they did not plan to enter teaching the academic year following graduation, but did teach the academic year following graduation; and
Not teach/Not teach	Those who reported at the time of graduation that they did not plan to enter teaching the academic year following graduation and did not teach the academic year following graduation.

Table 5 presents the number of graduates from samples one, and two classified by the group classification under the One Year Career Path.

Five Year Career Path The variable "employment patterns" from Time 3 was used to classify Five Year Career Path into four mutually exclusive groups. As defined by Sweeney, these four groups are:

Entered and left	Those who entered teaching the first year following graduation and left before five years and did not reenter;
Entered and stayed	Those who entered teaching either the first, second, or third year following graduation and continued to teach through five years;
Taught intermittently	Those who either entered, left, and reentered teaching during the five years or those who entered the fourth or fifth year and continued to teach through five years; and

TABLE 5. Number of graduates classified by the One Year Career Path groups

One Year Career Path group	Sample One		Sample Two	
	N	Valid percent	N	Valid percent
Teach/Teach	145	60.2	78	51.3
Teach/Not teach	38	15.8	31	20.4
Not teach/Teach	16	6.6	13	8.6
Not teach/Not teach	42	17.4	30	19.7
Missing	5		2	
Total	246	100.0	154	100.0

Never taught

Those who never taught during the five years following graduation.

Table 6 presents the number of graduates from samples one, and two classified by the group classification under the Five Year Career Path.

Independent variables (Career path determinants)

Personal and Background Characteristics Four variables were employed to measure this characteristics in this study. They were:

TABLE 6. Number of graduates classified by the Five Year Career Path groups

Five Year Career Path group	Sample One		Sample Two	
	N	Valid percent	N	Valid percent
Entered and left	46	19.4	30	19.6
Entered and stayed	100	42.2	65	42.5
Taught intermittently	40	16.9	23	15.0
Never taught	51	21.5	35	22.9
Missing	9		1	
Total	246	100.0	154	100.0

1. Gender: Sex of the graduates were coded as: female = 1, and male = 2. The number of graduates categorized by sex in each sample is presented in Table 7.
2. Marital status: At the time of graduation, graduates were asked to report their marital status. The response categories were coded as: single or other = 1, married, no children or married, one or more children = 2. The number of graduates categorized by marital status in each sample is presented in Table 7.

3. Academic ability/achievement: Two variables, "grade point average (GPA)" and "high school rank (HSR)," were operationalized as a measure of academic ability/achievement in this study. The average of the GPA at the time of admission and the GPA at the time of graduation was used as a measure for GPA in analyzing the One Year Career Path, while the GPA at the time of graduation alone was used as a measure for GPA in analyzing the Five Year Career Path. The mean and standard deviation of these two measures for academic ability/achievement in each sample are presented in Table 8.

Preparation Program Factors Three variables were used in this study as a measure of this factor. They were:

1. Student teaching: From the review of Sweeney's study, the indicator that measured student teaching and was used in her analysis is perceived satisfaction with cooperating teacher. The graduates were asked at the time of graduation to rate their satisfaction with their cooperating teacher by using a five point scale. These five points were coded as follows: very satisfied = 5, satisfied = 4, neutral = 3, dissatisfied = 2, and very dissatisfied = 1. The

TABLE 7. Number of graduates classified by personal and background characteristics

Characteristic/ grouping	Sample One		Sample Two	
	N	Valid percent	N	Valid percent
Gender				
Female	204	82.9	131	85.1
Male	42	17.1	23	14.9
Total	246	100.0	154	100.0
Marital status				
Single	188	77.0	126	81.8
Married	56	23.0	28	18.2
Missing	2			
Total	246	100.0	154	100.0

mean and standard deviation for each sample are presented in Table 9.

2. Sense of efficacy: Two variables were employed to measure sense of efficacy. They were:

Self-evaluation as a teacher: At the time of graduation, graduates were asked to evaluate themselves. The response categories were coded as: an excellent teacher = 5, a better than

TABLE 8. Means and standard deviations of the variables measured academic ability/achievement

Variable	Sample One (N=246)		Sample Two (N=154)	
	Mean	S.D.	Mean	S.D.
GPA --combination of admission --and graduation	3.08	0.42	3.04	0.41
GPA --graduation	3.17	0.40	3.14	0.40
HSR	16.19	13.53	20.31	16.04

average teacher = 4, an average teacher = 3, a below average teacher = 2, and an inadequate teacher = 1.

Perceived adequacy of preparation: Six preparation areas were involved in this study. These six areas were--perceived adequacy of preparation in: (1) planning and delivering instruction; (2) interpersonal relations; (3) student motivation and discipline; (4) preparing and using instructional media; (5) assessing and implementing innovation; and (6) monitoring student achievement. At each measurement point,

graduates were asked to rate their adequacy of preparation in these specified areas. The responses were coded as: very adequate = 5, adequate = 4, neutral = 3, inadequate = 2, and very inadequate = 1.

The mean and standard deviation of these variables that measured sense of efficacy for each sample are presented in Table 9.

3. Perceived quality of preparation program: The graduates were asked to rate the quality of the teacher preparation program at ISU on the scale of 0 to 10 (very poor to very high). The mean and standard deviation for each sample are presented in Table 9.

Employment Factors Four variables were used to operationalize employment factor in this study. They were:

1. Salary: At one year following graduation, graduates were asked to indicate their total income including their spouse's income, if married, during the previous year. The response categories were coded as: less than \$10,000 = 1, \$10,000 to \$14,999 = 2, and \$15,000 and over = 3. The number of each category for each sample is presented in Table 10.

TABLE 9. Means and standard deviations of the variables measured preparation program factors

Variable/ measurement time	Sample One (N=246)		Sample Two (N=154)	
	Mean	S.D.	Mean	S.D.
Perceived satisfaction with cooperating teacher at graduation	4.44	0.88	4.52	0.82
Self-evaluation as a teacher at graduation	4.35	0.59	4.24	0.78
Perceived adequacy of preparation in:				
Planning and delivering instruction				
at graduation	3.78	0.67	3.88	0.66
at one year	3.66	0.66	3.78	0.58
Interpersonal relations				
at graduation	3.26	0.86	3.31	0.83
at one year	3.19	0.83	3.18	0.83
Student motivation and discipline				
at graduation	3.47	0.82	3.31	0.79
at one year	3.18	0.89	3.52	0.81
Preparing and using instructional media				
at graduation	3.99	0.89	4.10	0.77
Assessing and implementing innovations				
at graduation	3.42	0.85	3.50	0.89

Table 9. continued

Variable/ measurement time	Sample One (N=246)		Sample Two (N=154)	
	Mean	S.D.	Mean	S.D.
Monitoring student achievement at one year	3.36	0.78	3.50	0.69
Perceived quality of preparation program at one year	6.60	1.81	6.65	1.84

TABLE 10. Number of graduates classified by total income

Total income	Sample One		Sample Two	
	N	Valid percent	N	Valid percent
Less than \$10,000	68	29.1	58	37.9
\$10,000 to 14,999	123	52.6	65	42.5
\$15,000 and over	43	18.4	30	19.6
Missing	12		1	
Total	246	100.0	154	100.0

2. Employment expectations: Three job characteristics were employed to measure employment expectations in this study. They were money, prestige, and advancement; leadership and responsibility; and power. At the time of graduation, graduates were asked to rate the importance of the specified job characteristics on the following scale: very important = 5, important = 4, neutral = 3, unimportant = 2, and very unimportant = 1. The mean and standard deviation for each sample and characteristics are presented in Table 11.

TABLE 11. Means and standard deviations of job characteristics measured employment expectations

Job characteristic	Sample One (N=246)		Sample Two (N=154)	
	Mean	S.D.	Mean	S.D.
Money, prestige, and advancement	3.76	0.57	3.70	0.58
Leadership and responsibility	4.45	0.48	4.45	0.50
Power	3.26	0.80	3.40	0.77

3. Employment dissonance: The difference between employment expectations and employment reality was defined as an employment dissonance. At one year following graduation, graduates were asked to indicate whether their current job provided them with each job characteristics. There were five response categories which were coded as: all the time = 5, most of the time = 4, some of the time = 3, seldom = 2, and never = 1. Four job characteristics were used as the measure for this variable in this study. They were money, prestige, and advancement; opportunity to use special abilities and aptitudes; leadership and responsibility; and helping and serving others. The mean and standard deviation for each sample are presented in Table 12.

Note: In the RISE survey administered at the time of graduation, in Spring 1982 graduates also answered questions asking about long-range career plan, influences upon "employment expectations". Graduates who checked "teaching" or "employment in education other than teaching" as their options were not required to answer questions asking about employment expectations.

The graduates who checked "employment outside the field of education" or "other" were required to answer it.

TABLE 12. Means and standard deviations of job characteristics measured employment dissonance

Job characteristic	Sample One (N=246)		Sample Two (N=154)	
	Mean	S.D.	Mean	S.D.
Money, prestige, and advancement	0.85	0.94	0.76	1.04
Opportunity to use special abilities and aptitudes	0.73	0.93	0.76	1.07
Leadership and responsibility	0.27	0.79	0.28	0.86
Helping and serving others	0.40	0.72	0.48	0.80

4. Teaching level: The teaching level at which the graduates received teaching certification at the time of graduation was asked. The response levels were coded as preschool/kindergarten or elementary = 1, secondary or K-12 = 2. The number of graduates for each sample classified by the teaching level is presented in Table 13.

TABLE 13. Number of graduates classified by teaching level

Teaching level	Sample One		Sample Two	
	N	Valid percent	N	Valid percent
Preschool/kindergarten, and elementary	118	48.0	70	45.5
Secondary and K-12	128	52.0	84	54.5
Total	246	100.0	154	100.0

Indicators of Career Satisfaction Four variables were used as the indicators of career satisfaction in this study. They were:

1. Choose teaching again: The graduates were asked whether, if they had to do it over again, they would prepare to become a teacher. The response categories were coded as: yes = 3, undecided = 2, and no = 1. The mean and standard deviation for each sample are presented in Table 14.
2. Satisfaction with student teaching: The responses for satisfaction with student teaching were coded as follows: very satisfied = 5, satisfied = 4, neutral = 3, dissatisfied = 2, and

very dissatisfied = 1. The mean and standard deviation for each sample are presented in Table 14.

3. Intention to teach: At the time of graduation, graduates were asked to report their employment plans after graduation. The response categories were coded as obtained teaching position or seeking teaching position = 1 (plan to teach), and seeking nonteaching position or graduate study or other = 2 (plan not to teach). The number of graduates for each sample classified by the employment plans is presented in Table 14.
4. Job satisfaction: The graduates were asked to rate their satisfaction with their current job on a scale of 0 to 10 (very low to very high). The mean and standard deviation for each sample are presented in Table 14.

Hypotheses

The following hypotheses were generated for this study.

1. There is no significant difference among the results using the different sets of discriminators in discriminating the One Year Career Path group when compared on their relative contributions and group centroids.

TABLE 14. Means and standard deviations of indicators measured career satisfaction

Indicator/ measurement time	Sample One (N=246)		Sample Two (N=154)	
	Mean	S.D.	Mean	S.D.
Choose teaching again at graduation	1.49	0.67	1.58	0.71
at one year	2.48	0.75	2.30	0.79
Satisfaction with student teaching at graduation	4.32	0.92	4.15	0.94
Intention to teach at graduation	1.24	0.43	1.28	0.45
Job satisfaction at one year	7.00	2.41	6.57	2.52

2. There is no significant difference between the accuracy of classification when using the different set of discriminators in discriminating the One Year Career Path group.
3. There is no significant difference among the results using the different sets of discriminators in discriminating the Five Year Career Path group when compared on their relative contributions and group centroids.

4. There is no significant difference between the accuracy of classification when using the different set of discriminators in discriminating the Five Year Career Path group.

Statistical Procedure

In order to test the hypotheses for this study, the data were analyzed using the SPSSx computer program. The statistical analysis techniques employed in this study were discriminant analysis and chi-square. To determine the stabilities of the results from the discriminant analysis, the cross-validation method was employed.

Discriminant analysis is a technique in which several (independent or discriminating) variables are used simultaneously to statistically distinguish between two or more groups (of dependent variable) or to predict group membership (Klecka, 1980). Klecka (1975) also stated the objective of discriminant analysis as to weight and linearly combine the discriminating variables in some fashion so that the groups are forced to be as statistically distinct as possible. He explained clearly that the objective of discriminant analysis is to find a set of functions of the variables that maximally discriminate among groups. This kind of function is called a canonical discriminant

function. A canonical discriminant function is a linear combination of the variables which are formed to satisfy certain conditions. That is, the coefficients for the first function are derived so that the group means on the function are as different as possible. Unless all groups are identical, this function will not be able to exhaust the sources of differences among the groups. The coefficients for the second function then are derived to maximize the differences among the group means but under the added condition that scores on the second function are not correlated with scores on the first function. That is, scores on the second function maximize the differences among the groups after information from the first function is removed. A third function can be defined in a similar fashion having coefficients which maximize group differences while being uncorrelated with the previous functions, and so forth. The maximum number of unique functions derived in this fashion is equal to the number of groups of dependent variable minus one or the number of independent variables, whichever is smaller. The adequacy of these canonical discriminant functions can be checked by classifying the original set of cases to see how many are correctly classified by the variables being used. The proportion of cases correctly classified indicates the accuracy of the

procedure and indirectly confirms the degree of group separation (Klecka, 1980). Moreover, the stepwise procedure can be used in discriminant analysis. Stepwise procedure is the method for selecting the most useful discriminators that make the discrimination achieved satisfaction. According to Klecka (1980), the basic assumptions of discriminant analysis are as follows:

1. Dependent variable has to have two or more groups;
2. Each group has at least two cases;
3. The number of discriminating variables does not exceed the number of cases minus two;
4. Discriminating variables are measured at the interval level;
5. No discriminating variable may be a linear combination of other discriminating variables;
6. The covariance matrices for each group are approximately equal; and
7. Each group is drawn from a population with a multivariate normal distribution on the discriminating variables.

Some factors, such as the large amounts of missing data, highly correlated variables, and outliers were also mentioned to be able to negatively affect the results of discriminant analysis.

A detailed discussion of discriminant analysis is beyond the scope of this study. Klecka (1980) is a suggested source for interested readers.

Discriminant analysis provides the standardized discriminant function coefficients that can be used to determine which variables contribute most to the group discrimination. It also provides the canonical discriminant functions evaluated at group means which shows the locations of the group centroids. The criteria in testing hypotheses 1 and 3 in this study were:

1. The dominant discriminators from both sets of discriminators are the same.
2. Both sets of discriminators provide the same locations of the group means.

In testing hypotheses 2 and 4, chi-square was employed. Chi-square is a nonparametric statistical test which is used to determine the relationship or difference between two or more groups. The level of significance used in this study was set at .05.

CHAPTER IV. RESULTS

The cross-validating results from the statistical technique used to analyze data in this study are presented in this chapter. The prediction portions of the Career Path Model were tested based on the four hypotheses in order to determine the stability of the model. Sample one was used to be the development sample while sample two was employed to cross-validate the results from sample one. Two terms "the first set of discriminators and the second set of discriminators" were used in this study to refer to the set of discriminators obtained from using the stepwise discriminant analysis in examining the original 17 variables for the One Year Career Path and 19 variables for the Five Year Career Path on sample two, and the set of discriminators from Sweeney's study (sample one).

Hypotheses 1 and 2 were formulated to examine One Year Career Path, while hypotheses 3 and 4 related to Five Year Career Path. Discriminant analysis was employed to test all of the hypotheses. The results of the examining the One Year Career Path portion of the model are presented first.

Results of One Year Career Path Analyses

The first hypothesis that related to the One Year Career Path is:

Hypothesis 1: There is no significant difference among the results using the different sets of discriminators in discriminating the One Year Career Path group when compared on their relative contributions and group centroids.

That is, the results from cross-validating Sweeney's study on sample two were tested to determine whether they provided the same information as the results from using the original one. In order to cross-validate Sweeney's results, a set of ten discriminators from her study as presented in Table 1 were included in the stepwise discriminant analysis. By specifying the inclusion level in the analysis, these ten variables were entered one at a time in the same order as they were in Sweeney's study. Three canonical discriminant functions were obtained. The coefficients of these functions are presented in Table 15.

Only the first function was significant ($p < .0001$) comprising 83.28% of the total discriminating power. This function revealed that satisfaction with student teaching followed by employment expectations in leadership and responsibility contributed the most, compared to the other variables which were of minor importance.

In order to make the comparison, the relationship between the scores of the Career Path Determinant variables

TABLE 15. The standardized discriminant function coefficients --10 variables entered into the analysis: One Year Career Path

Variable	Standardized discriminant function coefficients		
	Function 1	Function 2	Function 3
Satisfaction with student teaching	-1.89	0.42	0.52
Employment expectations in leadership and responsibility	0.60	0.02	-0.66
Employment expectations in power	0.02	-0.36	0.11
GPA	0.37	-0.23	0.39
Marital status	0.32	0.84	-0.30
HSR	0.34	-0.54	-0.17
Self-evaluation as a teacher	0.17	0.18	0.05
Teaching certification level	0.24	-0.11	0.37
Choose teaching again	-0.19	0.74	0.44
Employment expectations in money, prestige, and advancement	0.26	0.62	0.49

measured at the time of graduation and the One Year Career Path group of ISU teacher education graduates were examined on sample two. Seventeen variables were included in the discriminant analysis. As mentioned in Chapter Three, these seventeen variables were included in the four major areas of Career Path Determinants. These variables as well as the dependent variables used to classify the One Year Career Path group are presented in Table 16.

In order to determine which variables contributed most to the discrimination of the One Year Career Path group, stepwise discriminant analysis procedures were executed. As reviewed earlier, a stepwise procedure selects the variables for entry into the discriminant function one at a time on the basis of their discriminating power. Following the Sweeney's study, the selection criterion is that the variable that maximizes the overall Wilks' lambda is selected. However, in the SPSSx program, a variable is required to pass certain minimum conditions before it is tested on the selection criterion. These conditions are a tolerance test and a partial F statistic (SPSSx User's Guide, 1983). The tolerance test is a test to assure computational accuracy. If the variable being tested is a linear combination of one or more of the variables already entered, its tolerance will approximately be zero (Klecka,

TABLE 16. The variables used in the One Year Career Path analyses

Career Path Determinant Area	Variable
<u>Dependent variables</u>	
	1. Current employment
	2. Intention to teach or Employment plans after graduation
<u>Independent variables</u>	
Personal and background characteristics	1. Gender
	2. Marital status
	Academic ability/achievement
	3. Grade point average
	4. High school rank
Preparation program factors	Student teaching
	5. Perceived satisfaction with cooperating teacher
	Sense of efficacy
	6. Self-evaluation as a teacher
	Perceived adequacy of preparation in:
	7. planning and delivering instruction
	8. interpersonal relations

Table 16. continued

Career Path Determinant Area	Variable
	9. student motivation and discipline
	10. preparing and using instructional media
	11. assessing and implementing innovation
Employment factors	Employment Expectations in:
	12. money, prestige, and advancement
	13. leadership and responsibility
	14. power
	15. Teaching certification level
Indicators of career satisfaction	16. Choose teaching again
	17. Satisfaction with student teaching

1980). The SPSSx default tolerance level is .001. The partial F statistic, which is computed as the F-to-enter, tests the additional discrimination introduced by the variable being considered after taking into account the discrimination achieved by the other variables already

entered. Variables that maximize this F statistic demonstrate the most discriminating power and are entered first into the analysis. Variables are then added one-by-one to the analysis on the basis of their abilities to improve the discrimination among groups. This process is continued until the addition of variables fails to improve group discrimination. At each step, variables already selected may be removed if they are found to reduce discrimination when combined with more recently selected variables. The SPSSx default F-to-enter is 1.0. The variable which maximizes the F-to-enter also minimizes Wilks' lambda, a measure of group discrimination. Wilks' lambda statistic takes into account the differences between all the centroids and the homogeneity within groups. Ten variables selected by the stepwise procedures which were called a second set of discriminators are presented in Table 17. The variables are listed in the order in which they were added to the analysis. That is, the most discriminating variable was added first. The Wilks' lambda values are also indicated. Every Wilks' lambda was significant ($p < .0001$).

The within groups correlations of the variables are presented in Table 29 in Appendix A. This table provides the basic information about the relationship between the corresponding pair of variables within the groups. It

TABLE 17. Summary table of variables remaining at conclusion of discriminant analysis of the One Year Career Path group: Sample Two

Variable	Step entered into analysis	Wilks' lambda at conclusion of analysis
Satisfaction with student teaching	1	0.60
Employment expectations in leadership and responsibility	2	0.49
Marital status	3	0.42
Employment expectations in money, prestige, and advancement	4	0.38
Perceived adequacy of preparation in student motivation and discipline	5	0.34
Perceived adequacy of preparation in assessing implementing innovation	6	0.31
Choose teaching again	7	0.27
Perceived adequacy of preparation in planning and delivering instruction	8	0.25
Gender	9	0.22
Perceived adequacy of preparation in preparing and using instructional media	10	0.21

reveals one of the reasons why some variables were not selected to be discriminators.

Only the correlation between the variables related to Adequacy of Preparation appeared to be high. The correlations between the variables related to Academic Ability/Achievement and between the variables related to Indicators of Career Satisfaction were also high, compared to the other intercorrelations. However, these intercorrelations were not high enough to be excluded from the analysis since they passed the tolerance test when a stepwise procedure was used.

Ten discriminators determined the three canonical discriminant functions used to classify cases into group membership. Then the standardized discriminant function coefficients were used to explain the relative importance of the variables to the discrimination. These coefficients are presented in Table 18.

Of the three functions, only the first one was significant ($p < .0001$) comprising 73.71% of the total discriminating power. That is, a strong relationship existed between the groups and the first discriminant function. This function showed that satisfaction with student teaching was the dominant variable. Perceived adequacy of preparation in student motivation and

TABLE 18. The standardized discriminant function coefficients after 17 variables entered into the analysis: One Year Career Path

Variable	Standardized discriminant function coefficients		
	Function 1	Function 2	Function 3
Satisfaction with student teaching	1.37	0.22	0.22
Employment expectations in leadership and responsibility	-0.57	0.15	-0.20
Marital status	-0.41	0.45	0.29
Employment expectations in money, prestige, and advancement	-0.46	-0.09	0.44
Perceived adequacy of preparation in student motivation and discipline	-0.74	0.24	-0.67
Perceived adequacy of preparation in assessing implementing innovation	0.43	0.92	-0.18
Choose teaching again	0.40	0.75	0.61
Perceived adequacy of preparation in planning and delivering instruction	0.39	-0.11	0.05
Gender	0.00	0.36	-0.64
Perceived adequacy of preparation in preparing and using instructional media	-0.03	-0.29	-0.50

discipline, and employment expectations in leadership and responsibility had the second and third high standardized coefficients. All of the other variables were of minor importance compared to these variables.

There were five discriminators in common in both sets of discriminators which contributed to the One Year Career Path group discrimination. They were satisfaction with student teaching; employment expectations in leadership and responsibility; marital status; employment expectations in money, prestige, and advancement; and choose teaching again. In both analyses, the relative contributions of the discriminators seemed likely similar. However, in the second analysis, the variable of perceived adequacy of preparation in student motivation and discipline contributed the second most importance to group discrimination while it did not contribute at all in the first analysis. The significant function in the first analysis had the total discriminating power about 10% more than the second analysis.

Since the first function determined by each set of discriminators was very informative on its own, the groups centroids of the first function of each analysis are presented in Table 19. They indicated the most typical position for each group and explain which groups differ on a function.

TABLE 19. Canonical discriminant function of both analyses evaluated at group means: One Year Career Path analysis

Group	Group centroids	
	Function in First analysis	Function in Second analysis
Teach/Teach	-1.15	1.10
Teach/Not teach	-0.41	0.84
Not teach/Teach	1.00	-1.00
Not teach/Not teach	1.54	-1.72

Table 19 reveals that function in both analyses marked the same results when evaluated with the canonical discriminant function at group means. They discriminated between the two groups of graduates who planned to enter teaching and the two groups who did not plan to enter teaching. The group of graduates who planned to teach and did teach (Teach/Teach) tended to be similar to those who planned to teach but did not teach (Teach/Not teach). The group of graduates who did not plan to teach but did teach (Not teach/Teach) tended to be similar to those who did not plan to teach and did not teach. Primary discrimination on

each function was between the Teach/Teach and the Not teach/Not teach groups.

In summary, since the set of discriminators originally obtained from examining seventeen variables by using the stepwise discriminant analysis and the set of discriminators obtained from Sweeney's study were different, the relative contribution of each set of discriminators to group discrimination cannot be compared individually. However, when considering the discriminators as a whole, their relative contributions seemed likely stable no matter which set of discriminators was employed. In addition, the group centroids revealed the same results on both sets of discriminators. Therefore, this hypothesis is retained. That is, in general, both sets of discriminators provided the same results in term of the relative contributions of the discriminators and the group centroids.

Hypothesis 2: There is no significant difference between the accuracy of classification when using the different set of discriminators in discriminating the One Year Career Path group.

To examine the accuracy of the discriminant functions derived by the discriminators to correctly classify the cases, the results of the classification analysis were used. In order to improve the accuracy of correct classification,

prior probabilities were incorporated into the classification procedure. According to Table 5, numbers of graduates varied across the groups of the One Year Career Path. Therefore, the prior probabilities based on the group size was used in the classification procedures. The results of the classification obtained from both sets of discriminators are presented in Table 20 and Table 21.

Overall 68.66% of cases were correctly classified by the first set of discriminators and 70.33% by the second set of discriminators. Chi-square indicated that these two sets of discriminators provided the same results in the correct grouped classification (chi-square = 6.62, p-value = 0.08). Therefore, the hypothesis is retained. That is, the set of discriminators from Sweeney's study can be used to classify or predict the One Year Career Path of another sample of the ISU teacher education graduates.

The cross-validation of Sweeney's study, as the results of hypotheses 1 and 2, showed the evidence that the prediction portion of the Career Path Model one year after graduation was stable.

TABLE 20. Discriminant analysis classification summary of the One Year Career Path groups: First set of discriminators

Group	Prior probability ^a (pct)	Actual Number of cases ^b	Predicted group membership			
			Teach/Teach	Teach/Not teach	Not teach/Teach	Not teach/Not teach
Teach/Teach	43.3	29	24 (82.8%)	1 (3.4%)	1 (3.4%)	3 (10.3%)
Teach/Not teach	16.4	11	5 (45.5%)	3 (27.3%)	0 (0.0%)	3 (27.3%)
Not teach/Teach	10.4	7	1 (14.3%)	1 (14.3%)	3 (42.9%)	2 (28.6%)
Not teach/Not teach	29.8	20	2 (10.0%)	0 (0.0%)	2 (10.0%)	16 (80.0%)

^aSixty-seven cases were used in analysis; 87 cases were excluded from analysis because group data were missing (0) or data for at least one discriminating variable were missing (85) or both (2).

^bSixty-seven cases were used for classification; 87 cases were excluded because data for at least one discriminating variable were missing.

TABLE 21. Discriminant analysis classification summary of the One Year Career Path groups: Second set of discriminators

Group	Prior probability ^a (pct)	Actual Number of cases ^b	Predicted group membership			
			Teach/Teach	Teach/Not teach	Not teach/Teach	Not teach/Not teach
Teach/Teach	43.3	37	30 (81.1%)	3 (8.1%)	1 (2.7%)	3 (8.1%)
Teach/Not teach	16.4	18	9 (50.0%)	9 (50.0%)	0 (0.0%)	0 (0.0%)
Not teach/Teach	10.4	11	2 (18.2%)	0 (0.0%)	4 (36.4%)	5 (45.5%)
Not teach/Not teach	29.8	25	3 (12.0%)	0 (0.0%)	1 (4.0%)	21 (84.0%)

^aSixty-seven cases were used in analysis; 87 cases were excluded from analysis because group data were missing (0) or data for at least one discriminating variable were missing (85) or both (2).

^bNinety-one cases were used for classification; 63 were excluded because data for at least one discriminating variable were missing.

Results of Five Year Career Path Analyses

Hypothesis 3: There is no significant difference among the results using the different sets of discriminators in discriminating the Five Year Career Path group when compared on their relative contributions and group centroids.

The set of ten discriminators from Sweeney's study as shown in Table 2 were included in the stepwise discriminant analysis. The same procedure as done in testing hypothesis 1 was used. That is, these ten discriminators were entered one at a time in the same order as they were in Sweeney's study. The Wilks' lambda values were significant ($p < .02$). The standardized discriminant function coefficients reflected from the three canonical discriminant functions were obtained. They are presented in Table 22.

Of the three functions, only the first one was significant ($p < .0151$) comprising 54.47% of the total discriminating power. This function revealed that only intention to teach made the greatest contribution to group discrimination. The other discriminators were of minor importance.

In order to make the comparison, nineteen variables in the Career Path Determinants measured at the combination of the time at graduation and at one year after graduation were

TABLE 22. The standardized discriminant function coefficients after 10 variables entered in the analysis: Five Year Career Path

Variable	Standardized discriminant function coefficients		
	Function 1	Function 2	Function 3
Intention to teach	0.91	0.52	-0.02
Satisfaction with student teaching	0.01	0.53	0.02
Employment dissonance in opportunity to use special abilities and aptitudes	0.09	0.68	0.18
Perceived adequacy of preparation in student motivation and discipline	0.34	-0.82	-0.13
Total income	0.06	-0.08	-0.53
Self-evaluation as a teacher	0.18	0.20	0.07
Perceived quality of preparation program	-0.13	-0.27	0.74
Perceived adequacy of preparation in planning and delivering instruction	0.03	0.76	0.09
Employment expectations in money, prestige, and advancement	-0.30	-0.32	-0.46
Employment expectations in leadership and responsibility	0.16	-0.61	0.31

included in discriminant analysis to predict the Five Year Career Path group. These variables are presented in Table 23.

Stepwise discriminant analysis procedures were executed in order to determine the variables which contributed most to the discrimination of the Five Year Career group. Table 24 presents the lists of the selected variables along with their Wilks' lambda values. These Wilks' lambda values were significant ($p < .0001$).

As shown in Table 24, fourteen of the nineteen variables showed the significant contributions to the group discrimination in sample two. Unlike sample one, all variables from Personal and Background Characteristics were the discriminators. Besides, no areas of Career Path Determinants were dominant. All of the variables except total income from sample one also contributed in discriminating the Five Year Career group in sample two. The most discriminator was intention to teach.

The within groups correlations of the nineteen variables are presented in Table 30 in Appendix A. Similar to the analysis of the One Year Career Path, the correlations among and between the variables related to adequacy of preparation appeared to be high in all samples. Moreover, the correlations among and between the variables

TABLE 23. The variables used in the Five Year Career Path analyses

Career Path Determinant Area	Variable
<u>Dependent variables</u>	
1. Employment patterns	
<u>Independent variables</u>	
Personal and background characteristics	1. Gender
	Academic ability/achievement
	2. Grade point average
Preparation program factors	Student teaching
	3. Perceived satisfaction with cooperating teacher
	Sense of efficacy
	4. Self-evaluation as a teacher
	Perceived adequacy of preparation in:
	5. planning and delivering instruction
	6. interpersonal relations
	7. student motivation and discipline
	8. monitoring student achievement
	9. Perceived quality of preparation program

Table 23. continued

Career Path Determinant Area	Variable
Employment factors	10. Total income
	Employment Expectations in:
	11. money, prestige, and advancement
	12. opportunity to use special abilities and aptitudes
	13. leadership and responsibility
Indicators of career satisfaction	14. helping and serving others
	15. Teaching certification level
	16. Choose teaching again
	17. Satisfaction with student teaching
	18. Intention to teach
	19. Job satisfaction

related to employment dissonance and job satisfaction were high, compared to the other correlations.

Three canonical discriminant functions were determined by this set of discriminators. Table 25 presents the standardized discriminant function coefficients.

TABLE 24. Summary table of variables remaining at conclusion of discriminant analysis of the Five Year Career Path groups: Sample Two

Variable	Step		Wilks' lambda at conclusion of analysis
	entered	removed	
Intention to teach	1		0.75
Perceived adequacy of preparation in inter- personal relation	2		0.68
GPA	3		0.61
Perceived satisfaction with cooperating teaching	4		0.56
Perceived quality of preparation program	5		0.52
Employment dissonance in leadership and responsibility	6		0.48
Teaching certification level	7		0.45
Gender	8		0.42
Job satisfaction	9		0.38
Employment dissonance in money, prestige, and advancement	10		0.34
Employment dissonance in opportunity to use special abilities and aptitudes	11		0.31
Self-evaluation as a teacher	12		0.29

Table 24. continued

Variable	Step		Wilks' lambda at conclusion of analysis
	entered	removed	
Satisfaction with student teaching	13		0.27
Perceived adequacy of preparation in student motivation and discipline	14		0.25
Perceived adequacy of preparation in inter- personal relation		15	0.68
Perceived quality of preparation program		16	0.52
Perceived adequacy of preparation in planning and delivering instruction	17		0.25
Perceived quality of preparation program	18		0.52

Only the first function was significant ($p < .0001$) comprising 64.98% of the total discriminating power. This function was dominated by job satisfaction. Four variables made somewhat similar contribution. They were employment dissonance in money, prestige, and advancement; intention to teach; teaching certification level; and gender. The other discriminators were in minor importance.

TABLE 25. The standardized discriminant function coefficients after 19 variables entered into the analysis: Five Year Career Path

Variable	Standardized discriminant function coefficients		
	Function 1	Function 2	Function 3
Intention to teach	-0.70	-0.41	0.58
GPA	0.01	0.93	0.24
Perceived satisfactions with cooperating teacher	0.43	-0.22	-0.15
Employment dissonance in leadership and responsibility	-0.08	0.62	0.04
Teacher certification level	-0.68	-0.06	0.00
Gender	0.65	0.15	0.62
Job satisfaction	0.86	0.30	0.58
Employment dissonance in money, prestige, and advancement	0.71	0.36	-0.38
Employment dissonance in opportunity to use special abilities and aptitudes	0.30	-0.30	0.84
Self-evaluation as a teacher	-0.36	-0.25	0.20
Satisfaction with student teaching	-0.31	-0.39	0.35

Table 25. continued

Variable	Standardized discriminant function coefficients		
	Function 1	Function 2	Function 3
Perceived adequacy of preparation in student motivation and discipline	-0.43	0.78	-0.16
Perceived adequacy of preparation in plan- ning and delivering instruction	0.21	-0.74	0.22
Perceived quality of preparation program	0.16	0.45	0.31

In summary, a set of discriminators maximally discriminated among groups of the Five Year Career Path were different across samples. Nine discriminators were shared in common in the analyses of both set of discriminators. They were intention to teach; employment dissonance in leadership and responsibility; employment dissonance in money, prestige, and advancement; employment dissonance in opportunity to use special abilities and aptitudes; self-evaluation as a teacher; satisfaction with student teaching; perceived adequacy of preparation in student motivation and discipline; perceived adequacy of preparation in planning

and delivering instruction; and perceived quality of preparation program. They were related to all areas of the Career Path Determinants, except the area of Personal and Background Characteristics. The variables related to the Personal and Background Characteristics area contributed to group discrimination only for sample two. They also had high standardized coefficients compared to the other variables. Even though nine discriminators were shared in common in both analyses, their relative contributions were somewhat different across the analyses. Only the variable of intention to teach had the stable relative contribution to the group discrimination. The total discriminating power of the significant function in the first analysis was about 10% less than in the second analysis.

The group centroids of the first function of each analysis was examined. They are presented in Table 26.

Table 26 reveals that the significant function determined by the first set of discriminators discriminated between the graduates who taught and those who never taught. Primary discrimination on this function was between the entered and stayed and the never taught groups.

Unlike the first set of discriminators obtained from Sweeney's results, the second set of discriminators performed significant discriminant function which

TABLE 26. Canonical discriminant function of both analyses evaluated at group means

Group	Group centroids	
	Function in First analysis	Function in Second analysis
Entered and left	-0.42	0.56
Entered and stayed	-0.44	1.04
Taught intermittently	-0.13	-0.26
Never taught	1.12	-1.82

discriminated between the two groups of graduates who entered and left and those who entered and stayed in teaching and the two groups of graduates who taught intermittently and those who never taught. The group of graduates who entered and left teaching were likely similar to those who entered and stayed. The group of graduates who taught intermittently tended to be similar to those who never taught. The primary discrimination on this function was between the entered and stayed and the never taught groups.

Therefore, the results from examining the group centroids as well as the relative contributions were

different across the sets of discriminators. Thus, the hypothesis was rejected. That is, both sets of discriminators did not provide the same results in term of the relative contributions of the discriminators and the group centroids.

Hypothesis 4: There is no significant difference between the accuracy of classification when using the different set of discriminators in discriminating the Five Year Career Path group.

According to the discriminant analysis, the canonical discriminant functions performed the classification analysis which the group size was used as the prior probabilities. The results of this classification analysis served as the information in testing this hypothesis. Presented in Tables 27 and 28 are the results of the classification of the first and the second sets of discriminators, respectively.

Note: As shown in Tables 20, 21, 27 and 28, more than half of the cases in sample two were excluded from the analyses because group data were missing and/or data for at least one discriminator were missing. This is the effect of the missing data of the variables related to the employment expectations which was mentioned earlier in Chapter Three. However, the differences among samples of these variables were tested for both the One Year and Five Year data. The

TABLE 27. Discriminant analysis classification summary of the Five Year Career Path groups: First set of discriminators

Group	Prior probability ^a (pct)	Actual Number of cases ^b	Predicted group membership			
			Left teaching	Continuous teaching	Intermittent teacher	Never taught
Left teaching	25.6	20	9 (45.0%)	6 (30.0%)	3 (15.0%)	2 (10.0%)
Continuous teaching	32.0	25	5 (20.0%)	15 (60.0%)	2 (8.0%)	3 (12.0%)
Intermittent teacher	17.9	14	2 (14.3%)	6 (42.9%)	4 (28.6%)	2 (14.3%)
Never taught	24.4	19	1 (5.3%)	3 (15.8%)	1 (5.3%)	14 (73.7%)
Ungrouped cases	-	1	0 (0.0%)	0 (0.0%)	1 (100.0%)	0 (0.0)

79

^a Seventy-eight cases were used in analysis; 76 cases were excluded from analysis because group data were missing (1) or data for at least one discriminating variable were missing (75).

^b Seventy-nine cases were used for classification; 75 cases were excluded because data for at least one discriminating variable were missing.

TABLE 28. Discriminant analysis classification summary of the Five Year Career Path groups: Second set of discriminators

Group	Prior probability ^a (pct)	Actual Number of cases ^b	Predicted group membership			
			Left teaching	Continuous teaching	Intermittent teacher	Never taught
Left teaching	26.7	20	15 (75.0%)	2 (10.0%)	2 (10.0%)	1 (5.0%)
Continuous teaching	32.0	25	4 (16.0%)	18 (72.0%)	3 (12.0%)	0 (0.0%)
Intermittent teacher	17.3	13	2 (15.4%)	4 (30.8%)	4 (30.8%)	3 (23.1%)
Never taught	24.0	19	1 (5.3%)	1 (5.3%)	1 (5.3%)	16 (84.2%)
Ungrouped cases	-	1	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)

^aSeventy-five cases were used in analysis; 79 cases were excluded from analysis because group data were missing (1) or data for at least one discriminating variable were missing (78).

^bSeventy-eight cases were used for classification; 76 cases were excluded because data for at least one discriminating variable were missing.

results showed that there were no differences among the samples. That is, the graduates tended to have the same answers to the questions related to the employment expectations. Moreover, when the variables related to the employment expectations were excluded from the stepwise discriminant analyses, the overall percentages of the cases correctly classified were declined for samples one and two.

Overall 53.85% of cases were correctly classified by the first set of discriminators and 68.83% by the second set of discriminators. The result from the chi-square analysis revealed that the percentages of the correct grouped classification were the same over the two sets of discriminators (chi-square = 3.04, p-value = 0.39). Therefore, the hypothesis is retained. That is, the set of discriminators from Sweeney's study can be used to classify or predict the Five Year Career Path of another sample of ISU teacher education graduates.

Even though the two sets of discriminators did not show the statistical difference in correct grouped classification, they revealed the differences in the group centroids and their relative contributions to the group discrimination. Therefore, the prediction portion of the Career Path Model five years after graduation was not stable.

CHAPTER V. SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter summarizes the previous four chapters, discusses conclusions, and presents recommendations for future study.

Summary

The purpose of this study was to cross-validate the prediction portion of the Career Path Model developed by Sweeney (1987) in order to examine the accuracies of the predictions. Two samples were involved in this study. The first sample was the sample that Sweeney used to develop the model. It was called development sample which comprised of 246 ISU teacher education graduates who graduated in 1980/1981 academic year. The second sample used to serve the purpose of this study was called cross-validation sample. It was comprised of 154 subjects who graduated in 1981/1982 academic year from ISU teacher education program.

The Career Path Model was used to predict the One Year Career Path and Five Year Career Path group of ISU teacher education graduates. In One Year Career Path, the graduates in each sample were classified into four groups: (1) those who planned to enter teaching and did teach (Teach/Teach); (2) those who planned to enter teaching but did not teach (Teach/Not Teach); (3) those who did not plan to enter

teaching but did teach (Not Teach/Teach); and (4) those who did not plan to enter teaching and did not teach (Not Teach/Not Teach). The graduates were also classified into four groups in the Five Year Career Path. These four groups consisted of graduates (1) who entered and left teaching; (2) who entered and stayed in teaching; (3) who taught intermittently; and (4) who never taught.

As reviewed by Sweeney, seventeen variables within the four major areas of Career Path Determinants influenced the choice of career path of the graduates after one year following graduation, while nineteen variables influenced the Five Year Career Path choice. The following were the four major areas of Career Path Determinants: (1) Personal and Background Characteristics; (2) Preparation Program Factors; (3) Employment Factors; and (4) Indicators of Career Satisfaction. In cross-validation, the variables selected for the model from sample one as well as the relative contribution of each variable were examined on sample two. In addition, the comparisons of the accuracy of the discriminant functions (prediction equations) were made across the sets of discriminators. That is, the set of discriminators from Sweeney's study was cross-validated on sample two. Then the results were compared with the results of the set of discriminators obtained directly from the

stepwise discriminant analysis on sample two. Thus, this study developed and tested the following hypotheses:

1. There is no significant difference among the results using the different sets of discriminators in discriminating the One Year Career Path group when compared on their relative contributions and group centroids.
2. There is no significant difference between the accuracy of classification when using the different set of discriminators in discriminating the One Year Career Path group.
3. There is no significant difference among the results using the different sets of discriminators in discriminating the Five Year Career Path group when compared on their relative contributions and group centroids.
4. There is no significant difference between the accuracy of classification when using the different set of discriminators in discriminating the Five Year Career Path group.

The review of literature revealed that there was no certain index that can be used to determine the stability of the prediction equations. However, under the procedure of a stepwise discriminant analysis, the comparison between two

sets of discriminators can be made over (1) the standardized discriminant function coefficients to determine the relative importance of the variables to the model; (2) the group centroids to indicate the location of the group means; and (3) the percentage of the correct classification to determine the accuracy of the discriminant functions performed by the discriminators.

Hypotheses 1 and 3 were developed in order to examine the stabilities of Sweeney's results in terms of the relative contribution of the discriminators and the group centroids. That is, the discriminators from Sweeney's study was applied to sample two. To decide whether the results were stable or not, all Career Path Determinant variables were included in the analysis in sample two. Then a stepwise discriminant analysis procedure was used to select the variables that best discriminated among groups on sample two. Thus, sample two had two sets of discriminators which performed the results that can be employed to test the hypotheses.

Hypotheses 2 and 4 were related to the examining the accuracy of the discriminant functions performed by the discriminators. Each set of discriminators was examined whether they provided the same percentages of correct grouped classification. Chi-square test was used to examine these hypotheses.

Summary of the results from the analyses are as follows:

1. Overall, hypothesis 1 is retained. That is, the relationship between the scores of Career Path Determinant variables measured at the time of graduation and the One Year Career Path group of ISU teacher education graduates are stable in terms of the relative importance of discriminators and the locations of group means. The discriminators were stable in discriminating between the graduates who plan to enter teaching and those who did not plan to enter teaching. Moreover, in general, variables from all four major areas of Career Path Determinants contributed to the discrimination of the One Year Career Path group for both development and cross-validation samples. Each sample had a different set of ten discriminators. Five variables in the areas of Personal and Background Characteristics, Employment Factors, and Indicators of Career Satisfaction were the discriminators for both samples one and two. Four of the other five discriminators in sample two related to the Preparation Program Factors area, while only one discriminator in sample one related to this area. The first and second greatest discriminators were satisfaction with student teaching and employment expectations in leadership and responsibility.

2. In testing hypothesis 2, there was the evidence to conclude that the accuracy of classification performed by the set of discriminators from Sweeney's results was stable. In addition, the percentages of cases correctly classified exceeded the prior probabilities of correct classification. That is, this set of discriminators showed the ability in accurately discriminating between ISU teacher education graduates. The prediction was most accurate in identifying the graduates who actual employment at one year matched their plans at the time of graduation. It coincided with the result from hypothesis 1 that the primary discrimination was between the Teach/Teach and the Not teach/Not teach groups.

3. The results from rejection of hypothesis 3 can be explained as follows.

The set of discriminators contributed significantly to the Five Year Career Path group in Sweeney's study did not show the stable relative importance and locations of the group means in this study. That is, it was not stable in discriminating among the graduates. In general, nine discriminators were in common in samples one and two. They related to all areas of the Career Path Determinants, except the area of Personal and Background Characteristics. The discriminators related to such area contributed to group

discrimination only in testing with sample two. These discriminators were grade point average and gender. They also made great contributions compared to the other discriminators. However, only the strongest discriminator, intention to teach, was stable in contributing to the group discrimination.

4. The retaining of hypothesis 4 is that the set of discriminators from Sweeney's study performed the stable accuracy in classifying the Five Year Career Path. The percentages of cases correctly classified exceeded the prior probabilities of correct classification. Even though the chi-square test did not show the difference in the accurate classification between two sets of discriminators, the classification results showed some evidence. That is, by using the set of discriminators from Sweeney's study (the first set of discriminators), the prediction was more accurate in identifying the graduates who entered and stayed in teaching and those who never taught than it was in identifying those who entered and left teaching and those who taught intermittently. The second set of discriminators yielded somewhat difference in the result of classification. That is, the prediction was most accurate in identifying the graduates who entered and left teaching and those who never taught than it was in identifying those who entered and stayed in teaching and those who taught intermittently.

Discussion

The examination of the model on selected variables revealed that when a set of discriminators from development sample was applied to the other sample for predicting the One Year Career Path, the results were stable. The evidence also suggested that satisfaction with student teaching was the most important discriminator when studying the One Year Career Path choice of ISU teacher education graduates. According to the study of Williams (1985), satisfaction was found to be related to the importance that the graduates give to job characteristics. It also coincided with the literature reviewed by Sweeney (1987) that satisfaction with student teaching can be an important determinant of the teacher students' decision to enter or not enter the teaching profession. As this result, it is not surprised that the prediction was most accurate in identifying the graduates whose actual employment after one year matched their plans at the time of graduation.

The set of discriminators from development sample did not show the evidence that the location of group means as well as the relative contribution of the discriminators in predicting the Five Year Career Path were stable. However, the greatest discriminator has the stable relative contribution. It was the variable, intention to teach.

Since it was found that satisfaction with student teaching influenced the graduates' decision in entering the teaching profession, the variable intention to teach depended on the variable satisfaction with student teaching. That is, intention to teach showed the future employment of the graduates. Thus, under the procedure of discriminant analysis, only intention to teach made the great contribution to the group discrimination in Five Year Career Path analysis.

Both satisfaction with student teaching and intention to teach were included in the Indicators of Career Satisfaction area. That is, it can be concluded that the Indicators of Career Satisfaction strongly contributed to the Career Path of ISU teacher education graduates. Chapman (1983b) also indicated that career satisfaction was an important factor in determining teacher retention.

Generalization of the results from this study should be made cautiously. One cautious is an awareness of the mathematical assumptions in discriminant analysis that the variables are interval level, with a multivariate normal distribution. Some variables in this study, such as gender and marital status, were measured at the nominal level. Violation against the assumptions along with the amount of missing data as mentioned in Chapter Three could easily

cause an incorrect classification. However, Klecka (1980) suggested that the conservative interpretation can be made.

Recommendations

Based on the results from this study, the following recommendations are suggested:

1. A cross-validation study should be conducted using samples of the same size as the development sample. To deal with the missing data problems, cross-validation technique can be applied to the study. However, the results should be interpreted conservatively.
2. A study should be replicated using the different recommended criteria to determine the stability of the model.
3. Another cross-validation technique, such as a double cross-validation described by Mosier (1951), could be used. That is, the determination of the discriminators are made for sample one and sample two. Then, apply each set of discriminators back on the other sample to compute the predictive effectiveness.
4. According to the different number of gender in each sample, testing the model on each sex is recommended.

5. the model should be tested from other institutions.

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love, support, and sacrifice. It is to them that I dedicate this work.

APPENDIX A. TABLES

TABLE 29. Intercorrelation of the independent variables in discriminant analysis of the One Year Career Path group--Sample Two

Variables	1	2	3	4	5	6
1. Gender	1.00					
2. GPA	-0.33	1.00				
3. HSR	0.60	-0.61	1.00			
4. Marital status	0.13	-0.17	0.34	1.00		
5. Satisfaction with cooperating teacher	-0.06	0.22	-0.24	0.04	1.00	
6. Self-evaluation as a teacher	-0.07	0.02	-0.09	-0.06	0.14	1.00
7. Perceived adequacy of preparation in planning and delivering instruction	-0.02	-0.16	-0.04	-0.02	0.10	0.44
8. Perceived adequacy of preparation in interpersonal relations	-0.08	0.24	-0.32	-0.14	0.46	0.19
9. Perceived adequacy of preparation in student motivation and discipline	-0.05	-0.05	-0.07	0.05	0.21	0.44
10. Perceived adequacy of preparation in preparing and using instructional media	-0.16	-0.15	0.04	0.23	-0.08	0.24
11. Perceived adequacy of preparation in assessing and implementing innovations	-0.27	0.05	-0.20	0.06	0.01	0.43
12. Employment expectations in money, prestige, and advancement	0.08	0.00	0.09	-0.30	-0.11	0.16
13. Employment expectations in leadership and responsibility	-0.07	0.11	-0.20	-0.17	0.20	0.34
14. Employment expectations in power	0.08	0.02	0.14	-0.19	-0.20	0.05
15. Teaching certification level	0.13	-0.01	-0.03	0.09	0.01	-0.19
16. Choose teaching again	0.08	-0.14	0.19	-0.15	-0.39	-0.18
17. Satisfaction with student teaching	0.07	0.02	0.11	0.19	0.33	0.24

7	8	9	10	11	12	13	14	15	16	17
1.00										
0.27	1.00									
0.73	0.38	1.00								
0.26	-0.03	0.31	1.00							
0.59	0.14	0.51	0.32	1.00						
0.06	0.12	0.01	-0.21	0.27	1.00					
0.22	0.20	0.21	-0.02	0.22	0.30	1.00				
0.02	-0.01	-0.06	-0.16	0.06	0.40	0.24	1.00			
-0.09	-0.21	-0.20	0.07	-0.20	-0.10	-0.24	-0.16	1.00		
-0.37	-0.29	-0.32	0.02	-0.37	-0.03	-0.33	-0.00	0.10	1.00	
0.16	0.21	0.33	-0.04	0.17	0.14	0.44	0.04	-0.18	-0.63	1.00

TABLE 30. Intercorrelation of the independent variables in discriminant analysis of the Five Year Career Path group--Sample Two

Variables	1	2	3	4	5	6	7
1. Gender	1.00						
2. GPA	-0.30	1.00					
3. Satisfaction with cooperating teacher	-0.05	0.27	1.00				
4. Self-evaluation as a teacher	-0.16	0.05	0.13	1.00			
5. Perceived adequacy of preparation in planning and delivering instruction	-0.22	0.11	0.09	0.19	1.00		
6. Perceived adequacy of preparation in interpersonal relations	-0.10	-0.10	0.15	0.15	0.47	1.00	
7. Perceived adequacy of preparation in student motivation and discipline	-0.14	-0.24	0.08	0.12	0.63	0.49	1.00
8. Perceived adequacy of preparation in monitoring student achievement	-0.23	0.10	0.22	0.06	0.50	0.32	0.29
9. Perceived quality of preparation program	-0.05	-0.08	0.02	0.22	0.60	0.45	0.52
10. Total income	0.02	0.04	-0.05	0.08	0.04	-0.01	-0.08
11. Employment dissonance in money, prestige, and advancement	0.10	-0.24	-0.16	0.29	0.04	0.14	0.17
12. Employment dissonance in opportunity to use special abilities and aptitudes	-0.14	-0.11	-0.05	0.20	0.10	0.12	0.16
13. Employment dissonance in leadership and responsibility	0.15	-0.11	0.15	0.32	0.01	0.23	0.13

8	9	10	11	12	13	14	15	16	17	18	19
---	---	----	----	----	----	----	----	----	----	----	----

1.00

0.44 1.00
-0.04 0.11 1.00

-0.08 0.03 -0.10 1.00

-0.03 -0.00 -0.10 0.33 1.00

-0.00 -0.08 -0.10 0.28 0.45 1.00

Table 30. continued

Variables	1	2	3	4	5	6	7
14. Employment dissonance in helping and serving others	0.13	-0.14	0.12	0.33	-0.01	0.01	0.09
15. Teaching certifica- tion level	0.18	0.01	-0.05	-0.21	-0.01	0.03	-0.12
16. Choose teaching again	-0.04	0.07	0.29	-0.05	0.30	0.10	0.25
17. Satisfaction with student teaching	-0.12	-0.04	0.21	0.14	0.20	0.30	0.26
18. Intention to teach	0.17	0.05	0.01	-0.05	-0.03	-0.21	-0.01
19. Job satisfaction	-0.36	0.15	0.08	-0.11	0.07	-0.04	-0.01

8	9	10	11	12	13	14	15	16	17	18	19
0.04	-0.02	-0.13	0.47	0.54	0.63	1.00					
0.11	0.00	-0.06	0.06	-0.08	-0.09	-0.02	1.00				
0.19	0.16	0.01	-0.17	-0.03	-0.06	-0.08	-0.05	1.00			
0.03	0.25	0.16	0.16	0.13	0.11	0.14	-0.24	0.26	1.00		
-0.05	-0.17	-0.04	-0.01	-0.29	0.03	-0.02	0.09	-0.03	-0.55	1.00	
0.18	0.08	0.04	-0.57	-0.46	-0.41	-0.52	0.08	0.30	-0.11	0.10	1.00

APPENDIX B. SURVEY INSTRUMENTS

Teacher Education Program Graduate Survey

FIRST, we would like information about your teacher preparation program.

1. How long did you student teach? (check one).

7 weeks or less

8 weeks

12 weeks

16 weeks

Other (Please specify ---> _____).

2. Based on the length of your student teaching experience, should student teaching have been longer or shorter?

How many weeks?

Longer ---> _____

Shorter ---> _____

About right

3. At what level did you student teach?

Nursery/Kindergarten ---> skip to Q. 6

Elementary ---> skip to Q. 6

Secondary ---> skip to Q. 5

K-12 ---> Q. 4 then skip to Q. 6

4. (K-12) In what teaching area(s) of specialization do you expect to get a teaching certificate?

Art

Health

Music

P. E.

5. (Secondary) In what teaching area(s) of specialization do you expect to get a teaching certificate?

- | | | |
|---|---|---|
| <input type="checkbox"/> Agricultural Education | <input type="checkbox"/> Health Education | <input type="checkbox"/> Music |
| <input type="checkbox"/> Art | <input type="checkbox"/> Home Economics | <input type="checkbox"/> Physical Education |
| <input type="checkbox"/> Biology | <input type="checkbox"/> Education | <input type="checkbox"/> Physics |
| <input type="checkbox"/> Chemistry | <input type="checkbox"/> Industrial | <input type="checkbox"/> Psychology |
| <input type="checkbox"/> Earth Science | <input type="checkbox"/> Education | <input type="checkbox"/> Safety Education |
| <input type="checkbox"/> English | <input type="checkbox"/> Journalism | <input type="checkbox"/> Social Studies |
| <input type="checkbox"/> Foreign Language | <input type="checkbox"/> Mathematics | <input type="checkbox"/> Speech |
| <input type="checkbox"/> General Science | | |

If you checked more than one, what is your major area? _____

6. Using the rating scale below indicate how satisfied you were with aspects of your student teaching experience.

- Very Satisfied 5
 Satisfied 4
 Neutral 3
 Dissatisfied 2
 Very Dissatisfied . . 1

_____ Please circle your response

- | | | | | | |
|--|---|---|---|---|---|
| a. Getting your choice of geographical location for your student teaching assignment. | 5 | 4 | 3 | 2 | 1 |
| b. Your cooperating teacher. | 5 | 4 | 3 | 2 | 1 |
| c. Your university supervisor. | 5 | 4 | 3 | 2 | 1 |
| d. Based on your student teaching experience, what is your reaction to teaching as a career for you? | 5 | 4 | 3 | 2 | 1 |

7. At what age did you decide to become a teacher? _____ years old.

8. If you had it to do over again would you prepare to become a teacher?

- Yes
 No
 Undecided

9. Do you feel you will be ...

- ... an excellent teacher,
- ... a better than average teacher,
- ... an average teacher,
- ... a below average teacher, or
- ... an inadequate teacher?

10. During your academic program at Iowa State University, have you done any work with computers or had training with applications of computers to teaching?

- No
 - Yes ---> Please list courses and/or experiences _____
-

11. Please indicate how adequate your professional education preparation program was in the following areas. Use the following response categories.

- Very Adequate. 5
- Adequate 4
- Neutral. 3
- Inadequate 2
- Very Inadequate. 1

Please circle your response

Planning units of instruction and individual lessons	5	4	3	2	1
Preparing and using instructional media and equipment.	5	4	3	2	1
Maintaining student interest in classroom activities.	5	4	3	2	1
Understanding and resolving behavior problems in the classroom	5	4	3	2	1
Methods of working with emotionally disturbed.	5	4	3	2	1

Methods of working with children with learning problems	5	4	3	2	1
Diagnosing of learning disabilities.	5	4	3	2	1
Developing tests	5	4	3	2	1
Interpreting and using standardized tests.	5	4	3	2	1
Content preparation in your area of specialization.	5	4	3	2	1
Professional ethics and legal obligations.	5	4	3	2	1
Psychology of learning and its application to teaching.	5	4	3	2	1
Evaluating and reporting student work and achievement	5	4	3	2	1
Relating activities to interests and abilities of students.	5	4	3	2	1
Using written communication effectively.	5	4	3	2	1
Locating and using materials and resources in your specialty area	5	4	3	2	1
Evaluating your own instruction.	5	4	3	2	1
Individualizing instruction.	5	4	3	2	1
Selecting and organizing materials	5	4	3	2	1
Using a variety of instructional techniques	5	4	3	2	1
Understanding teachers' roles in relation to administrators, supervisors, and counselors.	5	4	3	2	1
Working with parents	5	4	3	2	1
Working with other teachers.	5	4	3	2	1
Assessing and implementing innovations	5	4	3	2	1

Appreciating and understanding individual and intergroup differences in values and lifestyles	5	4	3	2	1
Using community resources (AEA, for example)	5	4	3	2	1
Techniques of curriculum construction.	5	4	3	2	1
Influence of public laws and policies as they relate to schools.	5	4	3	2	1
Techniques for infusing multicultural learning into your own teaching.	5	4	3	2	1

12. How would you rate on a scale of 0 to 10 the quality of the Teacher Preparation Program at Iowa State University? (Please circle the appropriate number.)

Very Low	Very High									

0	1	2	3	4	5	6	7	8	9	10

13. In what ways did the program provide the most valuable professional preparation for you?

- (1) _____
- (2) _____
- (3) _____

14. In what ways should the program have offered more preparation?

- (1) _____
- (2) _____
- (3) _____

NOW, we would like to ask some questions about your plans for the future.

15. What are your employment plans for the remainder of the 1981/82 school year?

- ___ Have obtained a teaching position for the remainder of this school year.
- ___ Currently seeking or plan to seek a teaching position.

Currently seeking or plan to seek a non-teaching position.

Graduate study (Please specify area ----> _____).

Other (Please specify ----> _____).

16. What are your employment plans for the 1982/83 school year?

Have obtained a teaching position for 1982/83 school year.

Currently seeking or plan to seek a teaching position.

Currently seeking or plan to seek a non-teaching position.

Graduate study (Please specify area ----> _____).

Other (Please specify ----> _____).

17. What is your long-range career plan? (Please check the most appropriate response. Check only one.)

Teaching ----> skip to Q. 19

Employment in education other than teaching ----> skip to Q. 19

Please specify ----> _____

Employment outside the field of education

Please specify ----> _____

Other

Please specify ----> _____

18. Why do you plan not to enter the field of education?
Check as many as apply.

Lack of teaching positions available.

Greater career opportunities in nonacademic jobs.

Higher salaries and benefits in nonacademic jobs.

Marriage/family obligations.

___ Had not planned to enter education.

___ Decided not to work in education because of experience in student teaching.

___ Other (Please specify ---> _____)

19. How important is it that a job provide you with the following characteristics?

Please circle one number for each characteristic.

Use the following response categories.

- Very Important 5
- Important. 4
- Neutral. 3
- Unimportant. 2
- Very Unimportant 1

_____ Please circle your response

- a. Opportunity to be creative and original. . . 5 4 3 2 1
- b. Opportunity to use special abilities or aptitudes 5 4 3 2 1
- c. Opportunity to work with people rather than things 5 4 3 2 1
- d. Opportunity to earn a good deal of money . . 5 4 3 2 1
- e. Social status and prestige 5 4 3 2 1
- f. Opportunity to effect social change. 5 4 3 2 1
- g. Relative freedom from supervision by others. 5 4 3 2 1
- h. Opportunity for advancement. 5 4 3 2 1
- i. Opportunity to exercise leadership 5 4 3 2 1
- j. Opportunity to help and serve others 5 4 3 2 1
- k. Adventure. 5 4 3 2 1
- l. Opportunity for a relatively stable and secure future. 5 4 3 2 1
- m. Fringe benefits (health care, retirement benefits). 5 4 3 2 1

n. Variety in the work.	5	4	3	2	1
o. Responsibility	5	4	3	2	1
p. Control over what I do	5	4	3	2	1
q. Control over what others do.	5	4	3	2	1
r. Challenge.	5	4	3	2	1

NOW we would like to ask you some general questions about yourself and your family.

20. Up to the present, where have you spent the majority of your life?

- ... on a farm?
- ... in a non-farm country home?
- ... in a small town with population less than 2,500?
- ... in a town with population between 2,500 and 5,000?
- ... in a town with population between 5,000 and 50,000?
- ... in a city with population over 50,000?

21. Sex

- Female
- Male

22. Marital status

- Single
- Married, no children
- Married, one or more children
- Other

23. What was your father's occupation most of the time while you were living at home? Please be specific.

24. What was your mother's occupation most of the time while you were living at home? Please be specific.

25. Please think about the best elementary or secondary teacher you know or have known. What were the characteristics that made that teacher outstanding?

(1) _____

(2) _____

(3) _____

The College of Education and the Research Institute for Studies in Education appreciate the time you have taken to complete this questionnaire.

Postage for the questionnaire is prepaid, so all you need do is drop it in a mailbox.

One-Year Follow-up Teacher Education Graduate Survey

FIRST, we would like to ask you questions about your current employment.

1. What is your current employment situation?

Teaching ---> Please answer PART A, then skip to PART C.

Nonteaching ---> Please skip to PART B.

PART A (Teaching)

(a) What level do you teach?

Preschool/Kindergarten

Elementary (Grades 1-6)

Secondary (Grades 7-12)

K-12

(b) Are you teaching ...

... Full time?

... Part time?

... Substitute?

... Other?

(c) At the present, what subject area(s) do you teach? _____

(d) What are your plans for next year?

Remain in same position.

Seek similar position in different school.

Accepted similar position in different school.

Employment in education other than teaching.

Please specify ---> _____

Employment outside education

Please specify ---> _____

PART B (Nonteaching)

(a) What is your current occupation?

(b) What are your reasons for not teaching? Check as many as apply.

Graduate study. (Please specify area _____).

Could not find a teaching position in location I wanted.

Could not find a teaching position anywhere.

Better salaries in nonacademic jobs.

Marriage/family obligations.

Had not planned to teach.

Decided not to teach because of experiences in student teaching/teacher preparation.

(c) What are your employment plans for next year?

Have obtained a teaching position for next year.

Currently seeking or plan to seek a teaching position.

Do not plan to teach.

PART C (Teaching and Nonteaching)

(a) Please describe your long range career plan.

Now, we would like information about your Teacher Preparation Program.

2. Based on the length of your student teaching experience, should student teaching have been longer or shorter?

How many weeks?

Longer ----> _____

Shorter ----> _____

About right

3. At what level did you student teach?

Preschool/Kindergarten

Elementary

Secondary

K-12

4. In what teaching area of specialization(s) do you have teaching approval?

(a) Preschool/Kindergarten Level

Preschool/Kindergarten Other (Specify _____.)

(b) Elementary Level

Elementary Other (Specify _____.)

(c) K-12 Level

Art Health Music P. E. Other (Specify _____.)

(d) Secondary Level

<input type="checkbox"/> Agricultural	<input type="checkbox"/> Health	<input type="checkbox"/> Physical Science
<input type="checkbox"/> Art	<input type="checkbox"/> Home Economics	<input type="checkbox"/> Physics
<input type="checkbox"/> Biology	<input type="checkbox"/> Industrial Arts	<input type="checkbox"/> Psychology
<input type="checkbox"/> Chemistry	<input type="checkbox"/> Journalism	<input type="checkbox"/> Safety Education
<input type="checkbox"/> Earth Science	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Social Science
<input type="checkbox"/> English	<input type="checkbox"/> Music	<input type="checkbox"/> Speech
<input type="checkbox"/> Foreign Language	<input type="checkbox"/> Physical Education	<input type="checkbox"/> Other (Specify__.)
<input type="checkbox"/> General Science		

If you checked more than one, what is your major area? _____

If you indicated that you are currently employed in a teaching or nonteaching position, please answer Q. 5 - Q. 9. If you are not currently employed, skip to Q. 10.

5a. We would like you to rate your Teacher Preparation Program in specific areas: first, rate the adequacy of preparation; second, indicate how important the area is to your present position.

Very Adequate.	5	Very Important	5
Adequate	4	Important.	4
Neutral.	3	Neutral.	3
Inadequate	2	Unimportant.	2
Very Inadequate.	1	Very Unimportant	1
Not Applicable	N	Not Applicable	N

1) Planning units of instruction and individual lessons	5 4 3 2 1 N	5 4 3 2 1 N
2) Preparing and using media.	5 4 3 2 1 N	5 4 3 2 1 N
3) Maintaining student interest	5 4 3 2 1 N	5 4 3 2 1 N
4) Understanding and managing be- havior problems in the classroom	5 4 3 2 1 N	5 4 3 2 1 N
5) Teaching basic skills.	5 4 3 2 1 N	5 4 3 2 1 N
6) Consultation skills in inter- acting with other professionals.	5 4 3 2 1 N	5 4 3 2 1 N
7) Developing student-student relationships.	5 4 3 2 1 N	5 4 3 2 1 N
8) Referring students for special assistance	5 4 3 2 1 N	5 4 3 2 1 N
9) Skills for mainstreaming handi- capped students.	5 4 3 2 1 N	5 4 3 2 1 N
10) Methods of working with children with learning problems	5 4 3 2 1 N	5 4 3 2 1 N
11) Assessing learning problems.	5 4 3 2 1 N	5 4 3 2 1 N
12) Developing tests	5 4 3 2 1 N	5 4 3 2 1 N
13) Interpreting and using standardized tests	5 4 3 2 1 N	5 4 3 2 1 N
14) Content preparation in your area of specialization	5 4 3 2 1 N	5 4 3 2 1 N
15) Professional ethics and legal obligations.	5 4 3 2 1 N	5 4 3 2 1 N

16) Psychology of learning and its application to teaching. . .	5 4 3 2 1 N	5 4 3 2 1 N
17) Evaluating and reporting student work and achievement	5 4 3 2 1 N	5 4 3 2 1 N
18) Relating activities to interests and abilities of students. . . .	5 4 3 2 1 N	5 4 3 2 1 N
19) Using written communication effectively.	5 4 3 2 1 N	5 4 3 2 1 N
20) Locating and using materials and resources in your specialty area	5 4 3 2 1 N	5 4 3 2 1 N
21) Evaluating your own instruction.	5 4 3 2 1 N	5 4 3 2 1 N
22) Individualizing instruction. . .	5 4 3 2 1 N	5 4 3 2 1 N
23) Selecting and organizing materials.	5 4 3 2 1 N	5 4 3 2 1 N
24) Using a variety of instructional techniques	5 4 3 2 1 N	5 4 3 2 1 N
25) Understanding teachers' roles in relation to administrators, supervisors, and counselors. . .	5 4 3 2 1 N	5 4 3 2 1 N
26) Working with parents	5 4 3 2 1 N	5 4 3 2 1 N
27) Working with other teachers. . .	5 4 3 2 1 N	5 4 3 2 1 N
28) Assessing and implementing innovations.	5 4 3 2 1 N	5 4 3 2 1 N
29) Appreciating and understanding individual and intergroup differences in values and lifestyles	5 4 3 2 1 N	5 4 3 2 1 N
30) Using community resources. . . .	5 4 3 2 1 N	5 4 3 2 1 N
31) Techniques of curriculum construction	5 4 3 2 1 N	5 4 3 2 1 N
32) Influence of laws and policies related to schools	5 4 3 2 1 N	5 4 3 2 1 N
33) Techniques for infusing multicultural learning	5 4 3 2 1 N	5 4 3 2 1 N

5b. In rank order (1 highest rank) please list from the above items the corresponding numbers for the three areas of preparation with highest adequacy. Do likewise for the three areas with most importance to position.

	1	2	3
Adequacy of Preparation	___	___	___
Importance to Position	___	___	___

6. How important were each of the following in your decision to accept your present position? Use the following response categories.

- Very Important 5
- Important 4
- Neutral 3
- Unimportant 2
- Very Unimportant . . . 1
- Not Applicable N

Please circle your response

a. Desirable location	5	4	3	2	1	N
b. Salary offered	5	4	3	2	1	N
c. Type of position	5	4	3	2	1	N
d. Size of organization	5	4	3	2	1	N
e. Reputation of school, firm or organization	5	4	3	2	1	N
f. Liked people with whom I interviewed	5	4	3	2	1	N
g. Spouse has a job in the community	5	4	3	2	1	N
h. Only job I was offered	5	4	3	2	1	N

7. How would you rate on a scale of 0 to 10 your general satisfaction with your current job?

Very Low											Very High
0	1	2	3	4	5	6	7	8	9	10	

8. What is the population of the community where you are currently employed?

- | | |
|--|--|
| <input type="checkbox"/> Under 1,000 | <input type="checkbox"/> 10,000 - 24,999 |
| <input type="checkbox"/> 1,000 - 2,499 | <input type="checkbox"/> 25,000 - 50,000 |
| <input type="checkbox"/> 2,500 - 4,999 | <input type="checkbox"/> Over 50,000 |
| <input type="checkbox"/> 5,000 - 9,999 | |

9. To what extent does your most present job provide you with the following characteristics? Please circle one member for each characteristic. Use the following response categories.

- All of the Time 5
- Most of the Time 4
- Some of the Time 3
- Seldom 2
- Never 1

Please circle your response

- | | | | | | |
|---|---|---|---|---|---|
| a. Opportunity to be creative and original. | 5 | 4 | 3 | 2 | 1 |
| b. Opportunity to use special abilities or aptitudes | 5 | 4 | 3 | 2 | 1 |
| c. Opportunity to work with people rather than things | 5 | 4 | 3 | 2 | 1 |
| d. Opportunity to earn a good deal of money | 5 | 4 | 3 | 2 | 1 |
| e. Social status and prestige | 5 | 4 | 3 | 2 | 1 |
| f. Opportunity to effect social change. | 5 | 4 | 3 | 2 | 1 |
| g. Relative freedom from supervision by others. | 5 | 4 | 3 | 2 | 1 |
| h. Opportunity for advancement. | 5 | 4 | 3 | 2 | 1 |
| i. Opportunity to exercise leadership | 5 | 4 | 3 | 2 | 1 |
| j. Opportunity to help and serve others | 5 | 4 | 3 | 2 | 1 |
| k. Adventure. | 5 | 4 | 3 | 2 | 1 |
| l. Opportunity for a relatively stable and secure future. | 5 | 4 | 3 | 2 | 1 |

m. Fringe benefits (health care, retirement benefits)	5	4	3	2	1
n. Variety in the work.	5	4	3	2	1
o. Responsibility	5	4	3	2	1
p. Control over what I do	5	4	3	2	1
q. Control over what others do.	5	4	3	2	1
r. Challenge.	5	4	3	2	1

NOW we would like all respondents to evaluate the Teacher Preparation Program.

10. How would you rate on a scale of 0 to 10 the quality of the Teacher Preparation Program at Iowa State University?
(Please circle the appropriate number.)

Very Poor	Very High									

0	1	2	3	4	5	6	7	8	9	10

11. In what three ways did the program provide the most valuable professional preparation for you?

(1) _____

(2) _____

(3) _____

12. In what three ways should the program have offered more preparation?

(1) _____

(2) _____

(3) _____

13. If you had it to do over again, would you prepare to become a teacher?

Yes

No

Undecided

NOW we would like to ask you some general questions about yourself and your family.

14. Marital status

- Single (never married)
- Married, no children
- Married, one or more children
- Divorced or separated
- Widowed

15. Which of the following categories best describes your total income during last year? (If married, include spouse's income)

- less than \$ 9,999
- \$10,000 to \$14,999
- \$15,000 to \$19,999
- \$20,000 to \$24,999
- \$25,000 to \$29,999
- \$30,000 to \$49,000
- \$50,000 and over

16. Up to the present, where have you spent the majority of your life?

- ... on a farm?
- ... in a non-farm country home?
- ... in a town with population less than 2,500?
- ... in a town with population between 2,500 and 5,000?
- ... in a town with population between 5,000 and 10,000?
- ... in a town with population between 10,000 and 25,000?
- ... in a town with population between 25,000 and 50,000?
- ... in a town with population between 50,000 and 100,000?

___ ... in a city with population over 100,000?

17. Please think about the best elementary or secondary teacher you have had. What were the characteristics that made that teacher outstanding?

(1) _____

(2) _____

(3) _____

The College of Education and the Research Institute for Studies in Education appreciate the time you have taken to complete this questionnaire.

Postage for the questionnaire is prepaid, so all you need do is staple or tape it and drop it in a mailbox.

Five-Year Follow-up Teacher Education Program Graduate
Survey

FIRST, we would like to ask you questions about your current employment.

1. What is your current employment situation?

Teaching ---> Please answer PART A, then skip to page 3, PART C.

Nonteaching ---> Please skip to PART B, page 2.

PART A (Teaching)

(a) What level do you teach?

Preschool/Kindergarten

Elementary (Grades 1-6)

Secondary (Grades 7-12)

K-12

(b) Are you teaching ...

... Full time?

... Part time?

... Substitute?

... Other?

(c) At the present, what subject area(s) do you teach? _____

(d) What are your plans for next year?

Remain in same position.

Seek similar position elsewhere.

Employment in education other than teaching.

Please specify ---> _____

Employment outside education

Please specify ---> _____

___ Other Please specify ---> _____

PART B (Nonteaching)

(a) What are your reasons for not teaching at the present time? Check as many as apply.

- ___ Graduate study. (Please specify area _____)
- ___ Could not find a teaching position.
- ___ Inadequate salaries and benefits.
- ___ General working conditions (nonteaching duties, hours, classroom size, work load).
- ___ Student related (motivation, lack of discipline, general attitudes).
- ___ Feelings of ineffectiveness.
- ___ Administrator related (lack of support, dissatisfaction with administration, incompetent administration).
- ___ Lack of respect.
- ___ Emotional aspects (stress, burnout, frustration, boredom).
- ___ Lack of support from parents and community.
- ___ Lack of advancement opportunities.
- ___ Family obligations.
- ___ Had not planned to teach.
- ___ Better salaries and career opportunities in other fields.
- ___ Other (please specify) _____

(b) What are your employment plans for next year?

- ___ Remain in same position.
- ___ Seek similar position elsewhere.
- ___ Seek teaching position.
- ___ Employment in education other than teaching.

___ Other (please specify) _____

PART C (All Respondents)

(a) We are interested in your employment history (jobs) for the last five years. Using the occupational code below, please list your major employment for each of the last five years, starting with your current position.

- | | |
|---------------------------------------|---|
| 1 Teacher | 8 Clerical/Secretarial/
Administrative support |
| 2 Education-related
(non-teaching) | 9 Service |
| 3 Other professional | 10 Homemaker |
| 4 Technical | 11 Farmer |
| 5 Managerial/Administrative | 12 Student |
| 6 Sales/Business | 13 Unemployed |
| 7 Craftsman/Operative | 14 Other (specify) _____ |

YEAR (Following graduation)	POSITION (Occupational Code Number)	LOCATION (State/Country)
Fifth Year (Current Position)	_____	_____
Fourth Year	_____	_____
Third Year	_____	_____
Second Year	_____	_____
First Year	_____	_____

Any comments about your employment history: _____

(b) Five years from now, do you plan to be ...

- ___ Teaching
- ___ Employed in education other than teaching
- ___ Employed outside the field of education
- ___ Other (please specify) _____

ALL RESPONDENTS

2. How would you rate on a scale of 0 to 10 your general satisfaction with your current (most recent*) job?

Very Low Very High

 0 1 2 3 4 5 6 7 8 9 10

*Note: If you are currently unemployed, please answer questions 2, 3, and 4 as they pertained to your most recent position.

3. How important were each of the following factors in your decision to accept your most recent position? Please circle one number for each factor. Use the following response categories.

Very Important 5
 Important 4
 Neutral 3
 Unimportant 2
 Very Unimportant . . . 1
 Not Applicable N

Please circle your response

- | | | | | | | |
|---|---|---|---|---|---|---|
| a. Desirable location | 5 | 4 | 3 | 2 | 1 | N |
| b. Salary offered | 5 | 4 | 3 | 2 | 1 | N |
| c. Type of position | 5 | 4 | 3 | 2 | 1 | N |
| d. Size of organization | 5 | 4 | 3 | 2 | 1 | N |
| e. Reputation of school, firm or organization | 5 | 4 | 3 | 2 | 1 | N |
| f. Liked people with whom I interviewed . . . | 5 | 4 | 3 | 2 | 1 | N |
| g. Spouse has a job in the community | 5 | 4 | 3 | 2 | 1 | N |
| h. Only job I was offered | 5 | 4 | 3 | 2 | 1 | N |

4. To what extent does (did) your most recent job provide you with the following characteristics? Please circle one member for each characteristic. Use the following response categories.

All of the Time 5
 Most of the Time 4
 Some of the Time 3
 Seldom 2
 Never 1

Please circle your response

- | | | | | | |
|---|---|---|---|---|---|
| a. Opportunity to be creative and original. | 5 | 4 | 3 | 2 | 1 |
| b. Opportunity to use special abilities or aptitudes | 5 | 4 | 3 | 2 | 1 |
| c. Opportunity to work with people rather than things | 5 | 4 | 3 | 2 | 1 |
| d. Opportunity to earn a good deal of money | 5 | 4 | 3 | 2 | 1 |
| e. Social status and prestige | 5 | 4 | 3 | 2 | 1 |
| f. Opportunity to effect social change. | 5 | 4 | 3 | 2 | 1 |
| g. Relative freedom from supervision by others. | 5 | 4 | 3 | 2 | 1 |
| h. Opportunity for advancement. | 5 | 4 | 3 | 2 | 1 |
| i. Opportunity to exercise leadership | 5 | 4 | 3 | 2 | 1 |
| j. Opportunity to help and serve others | 5 | 4 | 3 | 2 | 1 |
| k. Adventure. | 5 | 4 | 3 | 2 | 1 |
| l. Opportunity for a relatively stable and secure future. | 5 | 4 | 3 | 2 | 1 |
| m. Fringe benefits (health care, retirement benefits). | 5 | 4 | 3 | 2 | 1 |
| n. Variety in the work. | 5 | 4 | 3 | 2 | 1 |
| o. Responsibility | 5 | 4 | 3 | 2 | 1 |
| p. Control over what I do | 5 | 4 | 3 | 2 | 1 |
| q. Control over what others do. | 5 | 4 | 3 | 2 | 1 |
| r. Challenge. | 5 | 4 | 3 | 2 | 1 |

NOW we would like you to evaluate the Teacher Preparation Program.

5. We would like you to rate your Teacher Preparation Program in specific areas: first, rate the adequacy of preparation; second, indicate how important the area is (was) to your most recent position.

Very Adequate.	5	Very Important	5
Adequate	4	Important.	4
Neutral.	3	Neutral.	3
Inadequate	2	Unimportant.	2
Very Inadequate. 1		Very Unimportant 1	
Not Applicable . N		Not Applicable . N	

- | | | |
|--|-------------|-------------|
| 1) Planning units of instruction
and individual lessons | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 2) Preparing and using media. | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 3) Maintaining student interest | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 4) Understanding and managing be-
havior problems in the classroom | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 5) Teaching basic skills. | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 6) Consultation skills in inter-
acting with other professionals. | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 7) Developing student-student
relationships. | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 8) Referring students for special
assistance | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 9) Skills for mainstreaming handi-
capped students. | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 10) Methods of working with children
with learning problems | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 11) Assessing learning problems. | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 12) Developing tests | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 13) Interpreting and using
standardized tests | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 14) Content preparation in your
area of specialization | 5 4 3 2 1 N | 5 4 3 2 1 N |
| 15) Professional ethics and
legal obligations. | 5 4 3 2 1 N | 5 4 3 2 1 N |

16) Psychology of learning and its application to teaching. . .	5 4 3 2 1 N	5 4 3 2 1 N
17) Evaluating and reporting student work and achievement	5 4 3 2 1 N	5 4 3 2 1 N
18) Relating activities to interests and abilities of students. . . .	5 4 3 2 1 N	5 4 3 2 1 N
19) Using written communication effectively.	5 4 3 2 1 N	5 4 3 2 1 N
20) Locating and using materials and resources in your specialty area	5 4 3 2 1 N	5 4 3 2 1 N
21) Evaluating your own instruction.	5 4 3 2 1 N	5 4 3 2 1 N
22) Individualizing instruction. . .	5 4 3 2 1 N	5 4 3 2 1 N
23) Selecting and organizing materials.	5 4 3 2 1 N	5 4 3 2 1 N
24) Using a variety of instructional techniques	5 4 3 2 1 N	5 4 3 2 1 N
25) Understanding teachers' roles in relation to administrators, supervisors, and counselors. . .	5 4 3 2 1 N	5 4 3 2 1 N
26) Working with parents	5 4 3 2 1 N	5 4 3 2 1 N
27) Working with other teachers. . .	5 4 3 2 1 N	5 4 3 2 1 N
28) Assessing and implementing innovations.	5 4 3 2 1 N	5 4 3 2 1 N
29) Appreciating and understanding individual and intergroup differences in values and lifestyles	5 4 3 2 1 N	5 4 3 2 1 N
30) Using community resources. . . .	5 4 3 2 1 N	5 4 3 2 1 N
31) Techniques of curriculum construction	5 4 3 2 1 N	5 4 3 2 1 N
32) Influence of laws and policies related to schools	5 4 3 2 1 N	5 4 3 2 1 N
33) Techniques for infusing multicultural learning	5 4 3 2 1 N	5 4 3 2 1 N

6. On a scale of 0 to 10 how would you rate the quality of the Teacher Preparation Program at Iowa State University? (Please circle the appropriate number.)

Very Poor				Very High						

0	1	2	3	4	5	6	7	8	9	10

7. In what three ways did the program provide the most valuable professional preparation for you?

(1) _____

(2) _____

(3) _____

8. In what three ways should the program have offered more preparation?

(1) _____

(2) _____

(3) _____

9. If you had it to do over again, would you prepare to become a teacher?

Yes

No

Undecided

10. What program improvements would you suggest for easing the transition from student to first-year teacher?

NOW we would like to ask you about your professional development in the last five years.

11. Have you upgraded your skills through formal education since graduating from the teacher preparation program?

Yes ----> Please answer (a) and (b)

No

(a) If yes, please check as many purposes as apply for participating in the formal education activities, and, for each purpose you check, indicate where you participated in the activity.

PURPOSE	LOCATION			
	4-Year college/university	2-Year college	Area Education Agency (AEA)	Other (specify)
<input type="checkbox"/> Prepare for different type teaching position (certification)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Prepare for different type position in education--nonteaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Prepare for different type position outside education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Recertification, job requirement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Professional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Personal growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(b) If yes, was this a degree program?

Yes ----> Type of degree Undergraduate Masters
 Graduate Doctoral

----> Number of semester hours

No ----> Number of semester hours
 Number of CEU credits
 Other (specify) _____

If you have NEVER TAUGHT during the five years following graduation, go to question 14. CURRENT AND FORMER TEACHERS, please answer questions 12 and 13 first.

CURRENT AND FORMER TEACHERS ONLY

12. We would like you to rate your perception of your teaching behavior in each of the following areas. Using the scale below, circle the number for each area that indicates how well you are doing or did in your most recent teaching position.

- | | Very
Low | Very
High |
|--|-------------|--------------|
| a. Providing a setting conducive to learning | 0 | 10 |
| b. Motivating students | 0 | 10 |
| c. Demonstrating knowledge of subject matter | 0 | 10 |
| d. Monitoring and evaluating student progress and understanding | 0 | 10 |
| e. Providing clear, concise explanations and examples | 0 | 10 |
| f. Managing instructional activities efficiently and ensuring student time on task | 0 | 10 |
| g. Communicating effectively with students | 0 | 10 |
| h. Demonstrating effective planning and organization skills. | 0 | 10 |
| i. Exhibiting a positive self-concept | 0 | 10 |
| j. Using evaluation activities appropriately. | 0 | 10 |
| k. Implementing the lesson plans effectively. | 0 | 10 |
| l. Maintaining high expectations for student achievement. | 0 | 10 |
| m. Incorporating effective questioning techniques | 0 | 10 |

n. Maintaining high standards for student behavior 0 1 2 3 4 5 6 7 8 9 10

o. Maintaining effective working relationships with peers and administrators. 0 1 2 3 4 5 6 7 8 9 10

13. We also would like your perceptions about employment factors related to teaching. Please indicate how satisfied you are/were with each of the following aspects of teaching. Use the following response categories.

Very Satisfied 5
 Satisfied 4
 Neutral 3
 Dissatisfied 2
 Very Dissatisfied . . . 1
 Not ApplicableNA

(Circle your response)

- a. Salary 5 4 3 2 1 NA
- b. General working conditions 5 4 3 2 1 NA
- c. Amount of administrative support received . . 5 4 3 2 1 NA
- d. Relationship with other teachers 5 4 3 2 1 NA
- e. Extent of involvement in decision making . . . 5 4 3 2 1 NA
- f. Job benefits 5 4 3 2 1 NA
- g. Job responsibilities 5 4 3 2 1 NA
- h. Extent to which job challenged and provided for professional growth 5 4 3 2 1 NA
- i. Level of job performance 5 4 3 2 1 NA
- j. Opportunities for advancement 5 4 3 2 1 NA
- k. Method with which job performance evaluated . 5 4 3 2 1 NA
- l. Frequency with which job performance evaluated 5 4 3 2 1 NA
- m. Size of community in which employed 5 4 3 2 1 NA
- n. Support given by family and friends for choice of teaching as a career 5 4 3 2 1 NA
- o. Amount of time spent working at job 5 4 3 2 1 NA

- p. Relationship with students 5 4 3 2 1 NA
- q. Level of parental involvement 5 4 3 2 1 NA
- r. Role played in professional associations . . . 5 4 3 2 1 NA
- s. Community support for education 5 4 3 2 1 NA
- t. Teaching as a career 5 4 3 2 1 NA

NOW we would like to ask you some general questions about yourself and your family.

14. Marital status Single (never married)

Married

Divorced, separated, or widowed

15. Do you have any children? Yes ---> How many?

No

16. What is the population of the community where you are currently or were most recently employed? Under 1,000

10,000 - 24,999

1,000 - 2,499

25,000 - 50,000

2,500 - 4,999

Over 50,000

5,000 - 9,999

17. Which of the following categories best describes your total income during last year? (If married, include spouse's income)

less than \$ 9,999

\$10,000 to \$14,999

\$15,000 to \$19,999

\$20,000 to \$24,999

\$25,000 to \$29,999

\$30,000 to \$49,000

\$50,000 and over

If you have any additional comments about teacher preparation or teaching in general, please use the space below.

The College of Education and the Research Institute for Studies in Education appreciate the time you have taken to complete this questionnaire.

Postage for the questionnaire is prepaid, so all you need do is staple or tape it and drop it in a mailbox.