A Survey of Factors Affecting Enrollment in Mathematics Teacher Education Programs

Rebecca Miller
Western Kentucky University

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Rebecca Jean

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A SURVEY OF FACTORS AFFECTING
ENROLLMENT IN MATHEMATICS TEACHER
EDUCATION PROGRAMS

A Specialist Project
Presented to
the Faculty of the Department of Educational Leadership
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Specialist in Education

by
Rebecca Jean Miller
October 1988
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A SURVEY OF FACTORS AFFECTING
ENROLLMENT IN MATHEMATICS TEACHER
EDUCATION PROGRAMS

Recommended November 11, 1938
(Date)

Thomas L. Updike
Director of Thesis

Stephen P. Jenkins
Charles E. Crane

Approved Dec. 13, 1938
(Date)

Elmer Bray
Dean of the Graduate College
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Concern for an adequate supply of competent mathematics teachers prompted this research. The study was implemented to identify the factors believed to be of importance in a student's decision concerning whether or not to become a public school teacher.

A comparison was made between two groups of mathematics students at Western Kentucky University. Mathematics students were separated according to whether or not they were pursuing teacher certification.

A two-part questionnaire was administered. The first part asked students to rate the importance of 10 selected career factors in their career decision. The second part asked students to rate these same 10 factors with regard to the attractiveness of public school teaching. The 10 factors were: (a) salary, (b) fringe benefits, (c) security, (d) job market, (e) working conditions, (f) contribution to society, (g) prestige, (h) advancement opportunities, (i) interesting work, and (j) congenial co-workers.

Statistically significant differences were found between the two groups on three of the ten factors of importance and on nine of the ten factors describing their
attraction to teaching. Five recommendations were offered for increasing the supply of mathematics teachers.
CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Recently, there has been considerable media coverage concerning a possible "teacher crisis" as decreasing enrollments indicate a future shortage of teachers. According to recent studies (Akin, 1980; Carnegie, 1986; Empey, 1984; Flowers, 1982; Howe & Gerlovich, 1981; McManus, 1985), this "crisis" is very real. Opponents to the teacher shortage viewpoint, such as, Emily Feistritzer (1986) feel the teacher shortage predictions have been greatly exaggerated. Feistritzer (1980) based her opinion on the fact that teachers were not leaving the profession at the 6 percent attrition rate predicted by earlier reports. The Carnegie Foundation for the Advancement of Teaching (1986) found that 204,000 new teachers will be needed in the nation's schools by 1991 and predicted that only 63% of these openings will be filled by 1993. Ann Flowers (1982) stated in her report to the House Subcommittee on Education that between 1971 and 1980 the annual number of new teacher graduates decreased from 314,000 to 159,000. A recent Department of Education survey (Carnegie, 1986) found that only 60% of all bachelor's degree recipients who obtained certification in 1980 were actually teaching in 1981.
Such statistics are especially alarming when one considers that the shortage will be acute in the areas of math and science. During the 1981-82 school year, only 50% of all math and science teachers were formally qualified to teach in these areas (Flowers, 1982).

This study examined selected career factors that may have contributed to a decline in the number of students choosing to enter the teaching profession. Also, this study provided information about how college students perceive teaching careers. The focus of the study was mathematics students because this was an area in which a critical shortage existed (National Commission on Excellence in Education, 1983 pp. 23-25). It is hoped that information provided by this study will be of value in finding ways to increase the number of students choosing to enter the teaching profession.

Statement of the Problem

This study closely followed the format of an earlier study by Oliver Fred McManus (1985). McManus surveyed college seniors at the University of Georgia who were pursuing similar degrees. The specific aim of his study was "to determine difference between two groups of college seniors as related to the following: (a) expected first year income; (b) ratings given to the importance of selected career factors in choices of careers; and, (c) ratings given
to the attractiveness of selected factors in public school teaching" (McManus, 1985, abstract).

This study investigated the same basic statements as the McManus study. However, the study sought to determine the difference between mathematics students at Western Kentucky University who were pursuing teacher certification and mathematics students who were not pursuing teacher certification, with respect to the same three areas of the McManus study.

Assumptions

1. Mathematics students at Western Kentucky University who were pursuing teacher certification were committed to public school teaching careers.

2. Mathematics students at Western Kentucky University who were not pursuing teacher certification were committed to careers other than public school teaching.

Definition of Terms

Advancement opportunity- the opportunity to move to a higher career level.

Career- the life work of an individual. This term is used interchangeably with occupation.

Career factor- an attribute of a career.

Commitment- the dynamic process of investing of self (Kroll et al., 1970, p.91).

Congenial co-workers- associates in work activities
who are agreeable and cooperative.

**Contribution to society** - represents benefits given to society.

**Fringe benefits** - benefits which a worker receives in addition to salary.

**Interesting work** - represents satisfactions received from work resulting from the worker's valuation of the work activities.

**Occupation** - an individual's chosen work. This term is used interchangeably with career.

**Prestige** - the power to command admiration.

**Salary** - income received in payment for work.

**Security** - the assurance of being able to maintain satisfactory income.

**Valuation** - the act of assessing the value of something.

**Value** - the worth of something in terms of its importance or usefulness.

**Work** - the performance of purposeful activity designed to achieve objectives.

**Work activities** - the tasks that are performed in order to achieve the objectives of work.

**Working conditions** - the physical conditions in which the work is done, the way in which the work is organized, and the equipment and materials with which the work is done.

**Work values** - factors which are desired or valued in an occupation.
Research Hypotheses

H01. There will be no statistically significant difference in the expected first year earnings of Western Kentucky University mathematics students pursuing teacher certification and those not pursuing teacher certification.

H02. There will be no statistically significant difference in the importance ratings given to each of the following career factors by Western Kentucky University mathematics students pursuing teacher certification and the importance ratings given to each of these factors by Western Kentucky University mathematics students not pursuing teacher certification: (a) salary, (b) fringe benefits, (c) security, (d) job market, (e) working conditions, (f) contribution to society, (g) prestige, (h) advancement opportunities, (i) interesting work, and (j) congenial co-workers.

H03. There will be no statistically significant difference in the attractiveness ratings given to each of the following career factors as they relate to public school teaching careers by Western Kentucky University mathematics students pursuing teacher certification and the attractiveness ratings given by Western Kentucky University mathematics students not pursuing teacher certification: (a) salary, (b) fringe benefits, (c) security, (d) job market, (e) working conditions, (f) contribution to society, (g) prestige, (h) advancement opportunities, (i) interesting work, and (j) congenial co-workers.
Limitations of the Study

1. This study was limited to students with mathematics majors or minors at Western Kentucky University who were enrolled in courses during the 1987 Fall Semester. This limits the generalizability of the study.

2. The small sample size \((n=143)\) limited the generalizability of the study.

3. The sample selection did not allow for randomly selected subjects. Since the study surveyed subjects of a particular order, and since all available subjects in the test location were used, generalization of the results was limited.

4. Responses received were ratings of importance and attractiveness only at the point in time when the survey was taken.

5. This study was limited to ten specific factors and it did not attempt to explain the importance of other factors in making a career decision. Factors which could have been explored, such as, academic ability and parental influence were left for future study.
CHAPTER II

REVIEW OF SELECTED LITERATURE

The purpose of this chapter is to review literature relevant to this study. This chapter is presented in three sections. The first section deals with reasons for teaching being selected as a career. The second section discusses the part work values play in career decisions. The third section reviews studies concerning the supply and demand for mathematics teachers.

Motives for Teaching

McManus (1985) sought to find ways with which to increase the supply of science and mathematics teachers in the public schools. The groups used in his study were seniors in the College of Education at the University of Georgia and seniors pursuing Bachelor of Science degrees in the University's College of Arts and Sciences. The McManus study used a Career Perceptions Questionnaire (CPQ), which he developed and field tested to determine how these two groups differed as related to the following: (a) expected first year income, (b) ratings given to the importance of selected career factors in choices of careers, and (c) ratings given to the attractiveness of selected
factors in public school teaching. His study consisted of 476 seniors in the College of Education and 453 seniors in the College of Arts and Sciences. A t test was used at the .01 level of significance to determine differences between the mean ratings of each career factor and between the means of expected first year income. Means and standard deviations were reported in rank order for each career factor.

In his study, McManus (1985) found that the two groups differed significantly in the ratings of importance of salary, job market, contribution to society, prestige, advancement opportunities, and congenial co-workers. He found no significant difference in the importance given to fringe benefits, security, working conditions, and interesting work. Interestingly, he found there was a significant difference in the attractiveness of all career factors in public school teaching, except contribution to society.

Eight recommendations for increasing the supply of science and mathematics teachers were reported as follows:

1. Beginning salaries should be raised to a level equal to beginning salaries expected in other careers.

2. Fringe benefits should be provided equal to those expected in other careers.

3. Job security should be equal to that offered by other careers.

4. Improve communication of the need for science and mathematics teachers to potential teachers.
5. The working conditions for teachers should be improved.

6. Increase the prestige of teachers.

7. Provide career development of teachers with opportunities for advancement.

8. Assignments of teachers should provide opportunity for attractive, differential roles within teaching careers.

A case study approach was used by Berry (1985) to investigate the career aspirations and expectations of eighty non-education students and one education student. The purpose of the study was the examination of reasons why students chose not to become teachers. The sample was composed of a mixture of students from a variety of backgrounds who were majoring in high-demand fields. Students were selected for the sample from six south-eastern colleges and universities. Each student was a senior and recommended by their individual department chairperson. Students were grouped as "high-achieving" or "average-achieving" and as "urban" or "rural".

Emphasis during the interview was given to understanding how these students perceived teaching and determining what changes would be necessary to attract and retain them as public school teachers. Students were asked to provide information on their motives, experiences, and expectations concerning their career choice. Students were also asked under what conditions they would consider teaching as a
career option. Students were asked what impact current policy reforms, such as, career ladders and merit pay may have on their decision concerning public school teaching as a career.

Findings from the study (Berry, 1985) indicated the following:

1. Salary incentives alone were not the most important ingredient in their decision.

2. "Urban" and "rural" students differed in their expectations of the teaching profession. "Rural" students were more influenced by their high school teachers than "urban" students. However, "rural" students were more likely to have been discouraged from teaching by their high school teachers who felt their brightest students "could do better".

3. "High-achieving" and "average-achieving" students differed in their career expectations relating to teaching. "High-achieving" students were more concerned about making a "contribution to mankind" than "average-achieving" students. However, "high-achieving" students were less willing to work in a bureaucratic setting.

4. Many talented college students would be attracted to teaching if working conditions were changed. Conditions would need to allow for greater teacher control, less paperwork, and an easier teacher certification process.

5. Public school teachers play a very powerful role in
developing career attitudes of talented students.

6. Career ladders and incentive pay would increase teacher status. However, the sole addition of pecuniary rewards and opportunities for advancement may have an adverse effect on the teacher labor market. Such policies might attract those whom we say we do not want in the public school classroom.

In a presentation to the National Science Teachers and Association for the Education of Teachers in Science, Evans (1984) stated that teaching salaries were seen as a major deterrent to prospective teachers. Evans surveyed college freshman from a medium-sized engineering university in the midwest. He grouped students as "teaching oriented" or "non-teaching oriented" based on their responses to Holland's Self-Directed Search (1977). Evans then had students to complete a Career Survey questionnaire which he himself developed. He did not statistically analyze the data from his survey stating that the research was purely descriptive in form. He used the mean and percentages to describe his results. He stated that "teaching oriented" students \( n=20 \) ranked the following reasons for not teaching, in order of priority: (a) low salary, (b) not wanting to do the typical things that teachers do each day, (c) concern for job security, (d) low maximum salaries after years of work, and (e) poor job availability.

Students were asked to report if they were discouraged
by family, counselors, or friends concerning teaching careers. Six of twenty "teaching oriented" students said they were discouraged by family, counselors, or friends. Evans (1984) stated that increased guidance counselor encouragement could add to the number of students who could pursue teaching careers. Students were also asked to state possible solutions to the reasons they gave for not teaching. In addition to increased salaries, other possible solutions were: allow teachers more curricular latitude, flexible/modular scheduling, computers, power to discipline, hire graders for teachers, and legal protection for teachers.

Andrew (1983) reported the results of a study concerning students involved in a five-year education program at the University of New Hampshire. Students enrolled in the program completed a three phase process of teacher certification. Phase I was a one semester course which placed students as teacher assistants in the public schools. Phase II required four courses in education. Phase III was a fifth year of study which included a full school year internship and one or two summers of graduate work. Contrary to earlier studies, it was found that the grade point average of those students admitted to phase III averaged about 3.1 on a 4.0 scale and the combined verbal and quantitative averages of the students admitted to phase III was 1029 on the Graduate Record Exam. Clearly, superior students were entering the program. During phase I,
students were required to complete a self analysis paper stating factors which influenced their decision to enter the program. At the end of phase I, 60% of all students continued in the program. The single most influential factor stated by students continuing in the program was social service motivation.

Career decision factors were studied over a five-year period with a stratified random sample taken (Fall 1976 through Spring 1981). A total of 248 papers were selected and read by graduate students in education. A list of factors for and against a career in teaching was cited. Several interesting generalizations were drawn:

1. "Helping/Human Growth" was the most important reason for both men and women to become teachers.

2. "Enjoyment of Children" was rated second; however, only 4.5% of the male students cited this as a contributing factor.

3. "Love of Subject" was rated third with equal significance for men and women.

4. Very few negative factors were mentioned by those who chose to continue; although, 4.7% reported salary as a negative factor.

From those students who listed themselves as "undecided", vacations were reported as a positive factor and poor salaries along with extra duties were negative factors.

Those not continuing, listed very few positive
characteristics; 11.3% cited "Helping/Human Growth" and 4.7% cited "Love of Subject" as positive factors. Negative factors cited by those students not continuing were: "Personal Characteristics" (34%), "Discipline Problems" and "Student Attitudes" (13.6%), "Poor Salary" (11.3%), and "Montonous Work" (9.1%). Further indications were that academically talented students were unconcerned by poor salary, job market, lack of job security, few promotion possibilities, restricted education budgets, and the influence of other people.

Andrew (1983) suggested appealing to talented students with a sort of Peace Corps approach. He suggested a three to five year commitment to teaching. This would eliminate the long term effects of low salary and poor opportunity for advancement which lead to teacher stress and burnout. Andrews believed social service the key to attracting capable students to teaching.

High school seniors and sophomores were subjects for a national longitudinal study (Roberson, Keith, & Page, 1983). Information obtained in the spring of 1980 was used for comparison during periodic follow-up. The sample consisted of 688 seniors who planned to attend college, but not to become teachers. Eighteen background variables were selected to explain aspiration to teach for college bound high school seniors. The variables were as follows:

1. Race
2. Family Background
3. Gender
4. Church Attendance
5. Ability
6. Self-concept
7. Locus of control
8. Family Orientation
9. Community Orientation
10. High School Grades
11. Parental Influence
12. Teacher Influence
13. The importance of success
14. Good income
15. Job Security
16. Important and Interesting Work
17. Working with Sociable and Friendly People
18. Occupational Aspiration

Items 13 through 17 were rated as either "not important", "somewhat important", or "very important" by the students with regard to selection of their future career. The authors (Roberson, Keith, & Page, 1983) assumed there was a casual relationship between ability and high school grades. Unfortunately, results from the study indicated an apparent negative influence of intellectual ability on the desire to teach. It was concluded that gender and ability interacted in the decision to teach. Primarily, white females (75% of the study) were the ones desiring to teach. Those who
chose to teach were less concerned by salary than those choosing other professions. Job security did not appear to be an important factor except for blacks. Those who chose to teach were less intellectually capable (based on high school grades) than those choosing other professions.

Page, Page, & Shelton (1982) conducted a study of factors contributing to teacher shortages. Questionnaires were sent to 2,478 high school seniors, 387 preservice teachers, and 315 inservice teachers in ten southeastern states. Four main problems were addressed by the study: (a) identify how high school seniors, pre-service teachers, and in-service teachers perceived teaching as a career opportunity; (b) determine the differences in the perceptions of these groups categorized on the basis of background information variables; (c) identify factors which significantly discriminated between students who were considering teaching and those who were not; and (d) determine the discriminating factors associated with pre-service and in-service teachers categorized on the basis of whether or not they would encourage others to enter the teaching profession. Frequency distributions were calculated to identify the perceptions of these groups. Analysis of variance was used to determine differences in perceptions of these groups based on background information.

The Wilks' Lambda discriminant analysis statistic was used by the authors (Page, Page, & Shelton, 1982) to
determine which factors discriminated between groups of high school students based on whether or not they were planning to teach. Discriminant analysis was used to determine discriminating factors between groups of pre-service and in-service teachers based on whether or not they would encourage others to become teachers. Major findings of the study indicated that 40% of high school seniors decided whether or not they wanted to teach by age 15. Seventy-one percent of the in-service teachers indicated they would encourage someone else to become a teacher. Interestingly, only 40% would encourage a daughter and 28% a son to become a teacher. Overall, teaching was seen more positively by females than males and more positively by blacks than whites. The single most discriminating factor was whether or not someone else had discussed the possibility with them. Only 1% of the students surveyed indicated that the school counselor had even discussed the possibility with them. All respondents considered salary, discipline problems, and working conditions as the most discouraging factors.

Jantzen (1981) reviewed surveys of the late 1940's, 1950's, and 1970's concerning why students chose to prepare to become teachers. His longitudinal study began during the 1945-46 school year. Teacher education classes of three California institutions were surveyed. The original instrument for the study was developed by a Phi Delta Kappa Teacher Recruitment Committee in 1945-1946. It contained
a checklist of 16 possible factors which might influence the decision to become a teacher.

After the original study was completed in 1946, it was replicated in 1949, 1951, 1956, and 1979 (Jantsen, 1981). Jantzen repeated his study in order to determine if reasons for becoming a teacher remain stable over a period of years. Results of the study indicated several consistencies, as well as, shifts in opinion. Except for 1951, all studies indicated "interest in children" as the number one reason for becoming a teacher. Women's opinions differed most significantly with the 1979 study. The upward shifts of 1979 were primarily in the following areas: expressed desire to help others, intellectual challenge, and desire to exercise individual initiative.

Three generalizations were presented:

1. Classroom teachers needed to realize their potential influence on prospective teachers because enthusiasm of a former teacher ranked fourth in importance.

2. Women usually decided to become teachers at an earlier age than men. Most women made their choice while in elementary school, high school, or early in college. Most men indicated they made their decision during college or as graduate students.

3. Teachers indicated a strong desire to play leadership roles and to continue academic pursuits. This suggested a healthy professionalism in potential teachers.
"Why don’t we attract more of our ablest students to the teacher education curricula?" This question was posed by Richard Saxe’s (1969) study concerning why students at Illinois Teachers College chose to prepare for teaching. Seventy-one students enrolled in a senior level course, Principles of Teaching, and twenty-three students in the student teaching seminar were subjects for this investigation. Students completed a simple form which asked three basic questions: (a) time of decision, (b) reason for decision, and (c) persons who influenced your decision to become a teacher.

The findings of the study yielded the following results:

1. Females were found to make their decision to become a teacher earlier than males.

2. The majority of both male and female students made their decision to teach during their last year of high school. This finding implied that attention to recruitment for the teaching profession should be concentrated on the last year of high school and possibly during the first year of college.

Reasons for teaching were divided into five categories. The following reasons were cited (there were multiple entries by many subjects) as follows: (a) "idealistic", (b) "good job", (c) "persuaded", (d) "influenced", and (e) "intellectual". Within the "good job" category
was a list of convenience reasons, such as, good pay and good hours for women who have children. One of the most frequently mentioned reasons for selecting teaching was the influence of a friend or relative who was a teacher. Obviously absent from the findings was mention of guidance counselors or recruiting persons. Two conclusions could be drawn from this: (a) information and recruiting efforts are ineffective, or (b) no effort is being made in high schools to recruit teachers.

Hood (1965) completed a survey of sophomores at the University of Montana who were enrolled in their first course in the School of Education during the 1964-1965 term. The 1965 survey was compared with a December 1944 survey of prospective teachers at Northern Montana College completed by the same researcher.

Hood’s 1944 study reported prospective teachers, mostly women, gave the following reasons for entering the teaching profession: (a) public service, (b) develops character, and (c) three-month summer vacation. The 1944 study reported the following as disadvantages: (a) no income during the summer, (b) isolation in rural areas, and (c) lack of personal freedom. The 1965 study reported the following as reasons for becoming teachers: (a) service to society, (b) working with young people, and (c) teaching provides training which can lead to other careers. Disadvantages reported by the 1965 study were: (a) personal freedom
restricted, (b) low salaries, and (c) over supply of teachers in certain fields.

Hood (1965) stated that the restrictions once imposed on teachers are for the most part no longer existent. However, teachers should accept the fact they are role models and accept with good grace the high moral standards of the profession. He suggested that school counselors provide prospective teachers with current information of the supply and demand for teachers. Also, Hood suggested teacher salaries should be raised to meet competition with other professions.

Fox (1961) reported a need for the recruitment of a large number of young people into the teaching profession. To achieve this end, he stated it was necessary to know the factors which influenced young people to enter teaching. His approach to address this concern was what he referred to as an "opinionnaire". This "opinionnaire" consisted of the twenty-five most frequently mentioned factors which influence prospective teachers in their selection of teaching as a career. Students were asked to indicate how important each item was by marking the item as "Significant", "Little", or "Not at All". This "opinionnaire" was completed in December, 1960 by 173 prospective teachers at Northern Illinois University. Four junior classes consisting of 75 elementary education students and four junior classes consisting of 98 secondary education students completed the survey. There were 52 men and 121 women completing the survey.
Results from the survey indicated two very altruistic motivations as the most important by both groups of students: (a) desire to work with children or adolescents, and (b) desire to impart knowledge. However, practical concerns were important to many respondents, such as: (a) opportunity to continue their own education, (b) opportunity to leave the profession and return to it later, (c) job security, (d) short school day and long summer vacations, and (e) trend toward increasing teacher salaries. Former teachers were listed as the single most significant influence in their decision to become a teacher. Elementary education students indicated a stronger desire to work with children than secondary education students. Secondary students were more influenced by a desire to teach a particular subject and by summer vacations than elementary education students. It is important to note that significant differences did exist with regard to the population studied. Females were more likely to decide to become a teacher earlier than were males. Eighty-two percent of the females made their decision in high school. Overall, 86% of the future elementary teachers and 51% of the future secondary teachers made their decision while still in high school.

Haubrich (1960) based his "mattress philosophy", i.e. teaching is "something to fall back on", on his survey of 195 students enrolled in the College of Education at the University of Utah during 1957-58. A questionnaire was
completed by students concerning their underlying motivations for selecting the teaching profession. Of the sample, 66% were enrolled in the field of secondary education and 79% were of junior, senior, or graduate standing. Of the 195 sampled, only thirty-five percent stated teaching as their major life goal. Thirty percent of those sampled responded that security "having something to fall back on" was their reason to become teachers. "Liking Children" was listed by 23% as their major reason for choosing to teach. While 30% indicated it as first, second, or third choice.

Students were also asked to rank the importance of certain social activities and experiences in order of preference. Findings indicated those who plan to teach ranked "family life" first, "being with other people" second, "having friends" third, "sports" fourth, and "the arts" fifth. The author found it interesting to note that religion was not mentioned. Among his suggestions for further research and study, Haubrich (1960) discussed the possibility of developing a screening device for prospective teachers based on motivating factors.

Richard's (1960) study was conducted to obtain information concerning the attitudes of beginning students enrolled in teacher education toward the different phases of teaching. An "attitude inventory" was administered to 530 education students at Ohio State University during the autumn quarter of 1958. Students were enrolled in 20
sections of "An Introduction to the Study of Education". The "attitude inventory" consisted of 44 declarative statements asking a true or false response, 5 multiple choice questions, and 1 statement asking for ranking by preference. Over 80% of the respondents felt teaching was a good career choice because the satisfactions outweigh the dissatisfactions. The majority of students chose teaching because they like children and stated the greatest single influence on their decision came from former teachers. All of the students believed anyone planning to teach should have actual work with children and training in how to teach.

Summary of Teacher Motivation Studies

The number one reason for becoming a teacher "wanting to work with children or adolescents" seemed to remain stable over time. However, practical matters were still no less a concern than they were in the 1950's. Although salary was seen as a major deterrent, the sole increase of salary alone would not attract many to teaching as a career. Many are motivated by security, the three month vacation, and the perfect hours for a working mother. One reoccurring fact was that most students make up their minds to teach during their high school years. Fortunately, the majority of prospective teachers did appear to be motivated by altruistic considerations, such as, concern for children and concern for society.
Work Values

Individuals tend to select careers which are congruent with their values. It was therefore appropriate to review studies which considered values in the selection of a career.

In order to better understand why students chose their major areas of study, Peterson & Roscoe (1983) sought to examine factors which influenced 437 junior and senior female undergraduate students at Iowa State University. Subjects were declared majors in the following areas: (a) bio-technical fields, (b) psycho-social fields, (c) food & nutrition, and (d) child development.

The Peterson & Roscoe (1983) study was conducted as a self-descriptive report. Each of the sixteen items discussed were part of a larger number of items included in a questionnaire designed to access variables concerning vocational choice. Using a 1-99 Likert scale, students were asked to respond to "How True" each item was for them. A score of "1" indicated not descriptive of them and a score of "99" indicated it as highly descriptive. A one-way analysis of variance was used to analyze the data.

Three distinct groupings of the 16 items were developed: (a) academic influences, (b) social influences, and (c) economic/pragmatic influences. Results were in keeping with Zytowski's 1970 finding that a number of variables are considered when making a career choice.
Five factors were found to be consistent for all areas: (a) personal interest, (b) preparation for desired career options, (c) opportunity to work with people, (d) opportunity for employment following graduation, and (e) opportunity for re-entry into the labor force. Students majoring in applied research (food & nutrition and child development) were more concerned with family and marriage expectations than students in basic research fields (bio-technical and psycho-social fields) who were more concerned with good work hours and vacation periods. Students in the biological sciences (bio-technical fields and food & nutrition) were more concerned with salary. Overall, students rated family and career responsibilities, along with interest in their field, as the most influential factors in their decisions. Peterson & Roscoe (1983) noted that college personnel should be aware of the life goals and values of students when advising them concerning a major.

Overall differences with regard to work values, were found between life stages by Krausz (1982). A sample of 210 persons completed a questionnaire during MBA classes in Northern California and 23 persons were contacted through their places of work. Of the 233 people in the sample, 149 were employed. Sixty organizational descriptions were utilized to identify each respondent's level according to six possible outcomes: (a) starting salary, (b) flexibility of work requirements, (c) opportunities for personal growth
and development, (d) opportunities for advancement, (e) responsibility and opportunities to participate in decision making, and (f) job security. Each level represents a specific value dimension.

Respondents were given hypothetical job offers and situations. They were then asked to use a 7 point scale ranging from "1" "definitely do not want to join" to "7" "definitely do want to join". Comparisons were made between four age groups: (a) 24 or less, (b) 25 to 30, (c) 31-34, and (d) 35 or more. The ratio of men to women was similar among age groups. Three univariate values were discussed: advancement, security, and flexibility. Results from the study indicated that the importance of advancement decreased with age. Security was very important to all age groups and significantly increased with age. Flexibility tended to decrease in importance with age. It was noted by the author (Krausz, 1982) that it is important for career counselors to be aware of the importance of these needs when counseling persons involved in vocational choice, change, or adjustment.

Williams (1972) reported that life values, work values, and personality characteristics are significantly related to occupational choice. Value patterns and personality characteristics of male graduate students at the University of Dakota were studied in the context of Holland's (1966) theory of vocational choice. Subjects were classified into
Holland's six personality classifications: social, artistic, intellectual, realistic, conventional, and enterprising. Each subject was administered the Holland Vocational Preference Inventory (1965), the Allport-Veron-Lindzey Study of Values (1960), the Miller Occupational Values Indicator (1956), and the Cattell & Eber Sixteen Personality Factor Questionnaire (1962).

Discriminant analysis revealed the following conclusions:

1. Subjects revealed vocations that were for the most part congruent with their values and personality.
2. Life values were significantly related to occupational choice.
3. Work values were significantly related to occupational choice.
4. Personality characteristics were significantly related to occupational choice.

Eleven occupational values were studied by Fretz (1972). Students were selected from five preprofessional programs: education, law, medicine, engineering, and business. All students had completed introductory courses in their areas and were classified as "second level" students. The questionnaire included eleven selected occupational values: pay received, security, prestige, advancement, variety of duties, working conditions, independence, opportunity to use special talents, challenge, self-satisfaction, and
fringe benefits. Students were asked to rank these variables in the order of importance to their career selection. Five variables (pay received, advancement, working conditions, fringe benefits, and prestige) were identified as significant discriminants.

Premedical and education students both gave their highest ratings to self-satisfaction. Education students ranked pay received and security as second and third in that order. Premedical students ranked challenge, opportunity to use special talents, and independence as second, third, and fourth respectively. The discriminating variables for medicine and education were challenge and autonomy for medicine and security for education. It was found that the five groups varied significantly with regard to their occupational values.

Previous studies (Fox, 1961; Haubrich, 1960; Saxe, 1969) have indicated that most education majors decided as early as high school to become teachers. It seemed appropriate to investigate if the values representative of ninth grade students differed from one time period to another. Anderson and Bosworth (1971) sought to explore how the occupational values of ninth grade students varied between the years 1958 and 1970. In 1958, 823 ninth grade students in New York State were administered an occupational values scale. In 1970, 634 ninth grade students from the same part of New York State were administered this same scale. Nine occupational
values were to be ranked by the students. The values were: security, prestige, salary, interesting work, advancement, working conditions, relations with others, independence, and benefits.

Comparison of the two groups suggested a relatively stable concept of work values over a period of time. There were of course some differences. Both groups ranked interesting work first and independence last. Benefits were ranked next to last by both groups and prestige seventh by both groups. Interestingly, salary was ranked fourth in 1958 and second in 1970. Also, security, advancement, and working conditions became more important to the 1970 students. It appeared that 1970 students were more interested in enjoyable work at high pay while 1958 students wanted a stable job they could enjoy.

Salary differentials of $800 or more proved to be the greatest single influence on job selection according to a study by Richardson, Jr. (1966). A random sample of 113 senior business administration majors at the University of North Carolina were asked to distinguish between 57 pairs of job offers. The influence of four identified factors was studied. These four factors were starting salary, job location, type of work, and company size. Starting salary and job location were found to be the two most important criteria in making a career decision.
Summary of Studies of Work Values

Identifying the work values of various occupations seemed to indicate a clear difference in the factors valued by those individuals who were planning to teach and those individuals who have chosen other careers. Individuals who were planning to teach appeared to have more altruistic motives than those who did not plan to teach. This study compared the values and perceptions of those mathematics students who were planning to teach with those who have chosen other careers.

Supply and Demand

The following studies are presented to represent both opinions for and against the possibility of teacher shortages in the near future.

The National Center for Education, under the direction of Emily Feistritzer (1986), conducted a nationwide survey of elementary and secondary teachers. The typical teacher was found to be white, female, married, between 35 and 40 years old, and finally a member of a teachers' union. Feistritzer felt that teachers fair pretty well in the marketplace with the average annual teacher's salary at $24,559. Eighty-eight percent of female teachers and 85% of male teachers felt they were not being paid enough for the work they do.

Feistritzer (1986) used the Department of Education's Center for Statistics 1976 projection that 1.65 million
teachers would need to be hired over the next eight years. Feistritzer pointed out that according to the National Center for Education's 1986 survey, the 6% attrition rate predicted by the Center for Statistics in 1976 did not take place as predicted (cited by Feistritzer, 1986). Feistritzer predicted that because of declining enrollments in public schools there would be little demand for extra teachers.

Interesting information concerning why teachers are in the profession was found by the survey (Feistritzer, 1986). More than 60% of the teachers surveyed, listed "a chance to use your mind and abilities" and "a chance to work with young people" as reasons for staying in the profession. About one half of those surveyed listed "appreciation of a job well done" and "a good salary" as reasons. Teachers were found to want greater freedom in choosing and designing what they teach. Feistritzer suggested the streamlining of certification requirements and rewarding of creativity in teaching with higher pay and more responsibility.

Howe & Gerlovich (1981) addressed the problem of teacher supply and demand. They suggested two needs should be confronted in order to alleviate this problem. "First, change the public's apathetic attitude and poor understanding of science; and second, compile complete data which identifies the specific areas of supply and demand inconsistencies by science discipline and state." (Howe & Gerlovich, 1981, p.8).
Howe & Gerlovich (1981) reviewed the findings of an Iowa State University and the State Department of Public Instruction study. The Iowa study proposed to investigate the problems of teacher supply/demand with emphasis in math and science. Results from the Iowa study indicated that teacher supply was decreasing more rapidly than student enrollment. In 1970, there were 234 certified bachelor degree graduates in mathematics and only 49 in 1980. Critical shortages of math teachers were reported by the public schools surveyed. Because industry jobs pay approximately 50% more than teaching, prospective math and science teachers were taking higher paying jobs in business and industry. The results of this shortage has meant less qualified teachers with minimal preparation in math and science.

In 1980, the Iowa study was extended to a national level. Questionnaires were mailed to all state science supervisors. Kentucky reported a critical shortage of physics and math teachers. The study (Howe & Gerlovich, 1981) indicated that on a national level, the number of math teachers was presently inadequate and certainly would not meet future needs. This report came at a time when the country was in a recessionary period when usually the number of teacher vacancies is generally low.

In 1979, the Executive Committee of the Association for School, College and University Staffing (ASCUS), under
the direction of then president Jim Akin, conducted a survey of the supply/demand of both elementary and secondary teachers. Information obtained by the survey was reported in general and specific terms according to field and geographical region. This information was made available in a report submitted by Akin (1980) to the ASCUS committee.

Results from the survey (Akin, 1980) indicated that 78% of the respondents strongly agreed and 19% generally agreed with the following statement, "In staffing for the 1979-80 school year (last completed season), school personnel administrators had difficulty in obtaining adequate numbers of qualified candidates for positions in some fields or combinations of fields." (Akin, 1980, p.7). Mathematics was identified to be one of most highly in demand subjects by all regions. The South East region reported mathematics as a 5, meaning a considerable shortage exists.

Summary of Supply and Demand Studies

Studies indicated a clear and present need for more teachers, especially in the area of mathematics (Akin, 1980; Carnegie, 1986; Empey, 1984; Flowers, 1982; Howe & Gerlovich, 1981). Although some would disagree (Feistritzker, 1986), there appeared to be a very real "crisis" on the horizon as our nation's teaching force begins to near the age of retirement (Flowers, 1982) and student enrollment will increase due to the "baby boomlet" as the baby boom generation's children begin to enter school (Empey, 1984).
CHAPTER III

METHODOLOGY

Research Design

This study was descriptive analytical, closely following the format of a doctoral dissertation completed by Oliver Fred McManus (1985). This study, however, cannot be classified as a replication of the afore mentioned study, since differences exist between study population and the analytical methodology employed.

The cross-sectional nature of the study and the use of self-report instrumentation are common elements of descriptive or survey research. Best (1970) stated that this form of research is particularly appropriate in the behavioral sciences. Best also stated, "Under the conditions that naturally occur in the home, the classroom, ..., human behavior can be systematically examined and analyzed." (Best, 1970, pp. 116-117).

Study Samples

Subjects for this study were selected from an intact accessible sample of students at Western Kentucky University. This method of sampling was selected to avoid the low return rate prevalent with mailed questionnaires.
The sample for this study contained two groups of mathematics majors and minors enrolled in course work at Western Kentucky University during the fall semester of 1987. Students were grouped according to those who planned to pursue a teaching certification and those who were not pursuing a teacher certification. Selection of courses to be surveyed were chosen with the co-operation of the mathematics department at Western Kentucky University. Only courses which had a high probability of containing mathematics majors and minors were selected.

The total study population numbered 236 students. The sample number of students completing the survey instrument was 174. Of this number, 31 were selected out as inappropriate to the study. The usable study sample numbered 143.

Data Collection

A self-report survey instrument was prepared closely following the format and items used by Oliver Fred McManus (1985). The completed instrument was reviewed for correctness. Individual items on the completed instrument were systematically reviewed to insure parallelism with the McManus study.

Students were given packets containing the following:
(a) a cover letter explaining the purpose of the study, and
(b) the "Career Perceptions Questionnaire" (CPQ) developed by McManus (1985) with one revision. Students were also asked to indicate whether or not they were pursuing teacher
certification. (The cover letter and questionnaire are included as Appendix A and B, respectively.)

The CPQ asked students to state the amount they expect to earn the first year they are employed. Students were asked to rate ten selected career factors concerning their importance in career selection using an important-unimportant scale. The CPQ also asked students to rate the attractiveness of ten selected career factors as they relate to public teaching careers using a weak-strong scale. Selected career factors for the CPQ are: salary, fringe benefits, security, job market, working conditions, contribution to society, prestige, advancement opportunities, interesting work, and congenial co-workers.

The CPQ was field tested by McManus (1985) for use in his study. He completed a test-retest reliability coefficient for each factor on the two parts of the questionnaire. A Pearson coefficient of correlation was calculated for eleven factors of the two-part questionnaire. Reliability coefficients for the factors ranged upward from $r=.80$. A literature base search of studies involving career choice was used to establish the validity of selected career factors.

Level of Significance

In order to identify statistically significant differences between the two groups, the .05 significance level was used as the basis for rejecting a null hypothesis.
in this study. The .05 level of significance was selected because of the small sample size (n=143). A significance level of .01 or .001 seemed unacceptably high for this type of study.

Treatment of the Data

Tabulation

Data were converted from questionnaires to tabulation form in a spread sheet format, and rechecked to insure accuracy. Data were included under twenty-one headings consistent with the listed hypotheses.

Analysis of variance

Stated hypotheses were tested utilizing an "F" ratio: multiway classification. This test was recommended in the "Epistat" Statistical Package computer program, produced by PC-519 Software Library, under the heading of appropriateness of tests. While the statistical Package found both the "T" test and the "F" test appropriate, the "F" test was recommended due to groups of unequal sample numbers.

Computer results of the analysis of variance included: the sample number, mean, standard deviation, degrees of freedom, "F" ratio, and significance level.

"F" ratios were double checked utilizing a "F" ratio probability test under the heading "ANOVA". All computer generated "F" ratio significance figures corresponded to computer print-outs of the data run.
Rank Ordering of Data

Factors were placed in rank order of importance and attractiveness for the two groups.

Summary of Methodology

The Career Perceptions Questionnaire was administered to mathematics students at Western Kentucky University by their classroom instructor. The questionnaire asked for expected first year income, ratings of importance of selected factors in making a career decision, and ratings of attractiveness of these selected factors in public school teaching careers.

The mean and standard deviation were determined for each item. The "F" ratio was used to determine significant differences between the two groups. A significance level of .05 was used. Factors were placed in rank order of importance and attractiveness for the two groups.
CHAPTER IV

FINDINGS

The present study sought to determine the differences between the attractiveness of public school teaching careers as perceived by mathematics students at Western Kentucky University who were planning teacher certification and those who were planning other careers. The study compared the importance ratings given to each of ten selected career factors for the two groups. Also compared were the ratings given to the attractiveness of the same ten career factors as they relate to public school teaching.

Descriptive Statistics

A total useable sample of 143 questionnaires was obtained. Group mean ratings were reported in rank order (see Tables 1, 2, 3, and 4). Mathematics students who were planning teacher certification rated interesting work and security as their highest priorities in selecting a career. Closely following were job market, contribution to society, working conditions, and congenial co-workers, in that order. Non-certification mathematics students also listed interesting work as their highest priority. Also cited by non-certification mathematics students were advancement opportunities,
### Table 1

**Importance Ratings of Career Factors in Career Choice by Mathematics Students Pursuing Teacher Certification**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>$\bar{x}$</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interesting Work</td>
<td>6.211</td>
<td>.809</td>
</tr>
<tr>
<td>2</td>
<td>Security</td>
<td>6.085</td>
<td>3.801</td>
</tr>
<tr>
<td>3</td>
<td>Job Market</td>
<td>5.801</td>
<td>1.069</td>
</tr>
<tr>
<td>4</td>
<td>Contribution to Society</td>
<td>5.732</td>
<td>1.383</td>
</tr>
<tr>
<td>5</td>
<td>Working Conditions</td>
<td>5.648</td>
<td>1.110</td>
</tr>
<tr>
<td>6</td>
<td>Congenial Co-Workers</td>
<td>5.085</td>
<td>1.422</td>
</tr>
<tr>
<td>7</td>
<td>Fringe Benefits</td>
<td>4.606</td>
<td>1.535</td>
</tr>
<tr>
<td>8</td>
<td>Prestige</td>
<td>4.521</td>
<td>1.557</td>
</tr>
<tr>
<td>9</td>
<td>Advancement Opportunities</td>
<td>4.493</td>
<td>1.433</td>
</tr>
<tr>
<td>10</td>
<td>Salary</td>
<td>4.028</td>
<td>1.424</td>
</tr>
</tbody>
</table>

$n=71$
Table 2

Importance Ratings of Career Factors in Career Choice by Mathematics Students Not Pursuing Teacher Certification

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>$\bar{x}$</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interesting Work</td>
<td>6.375</td>
<td>.813</td>
</tr>
<tr>
<td>2</td>
<td>Advancement Opportunities</td>
<td>5.736</td>
<td>1.374</td>
</tr>
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<td>3</td>
<td>Job Market</td>
<td>5.583</td>
<td>1.470</td>
</tr>
<tr>
<td>4</td>
<td>Working Conditions</td>
<td>5.472</td>
<td>1.267</td>
</tr>
<tr>
<td>5</td>
<td>Security</td>
<td>5.264</td>
<td>1.453</td>
</tr>
<tr>
<td>6</td>
<td>Salary</td>
<td>5.167</td>
<td>1.454</td>
</tr>
<tr>
<td>7</td>
<td>Fringe Benefits</td>
<td>4.625</td>
<td>1.515</td>
</tr>
<tr>
<td>8</td>
<td>Congenial Co-Workers</td>
<td>4.583</td>
<td>1.676</td>
</tr>
<tr>
<td>9</td>
<td>Contribution to Society</td>
<td>4.417</td>
<td>1.685</td>
</tr>
<tr>
<td>10</td>
<td>Prestige</td>
<td>4.125</td>
<td>1.727</td>
</tr>
</tbody>
</table>

$n=72$
Table 3

Attractiveness Ratings of Career Factors in Public School Teaching Careers by Mathematics Students Pursuing Teacher Certification

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>( \bar{x} )</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contribution to Society</td>
<td>5.915</td>
<td>1.079</td>
</tr>
<tr>
<td>2</td>
<td>Interesting Work</td>
<td>5.746</td>
<td>1.079</td>
</tr>
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<td>3</td>
<td>Job Market</td>
<td>5.563</td>
<td>1.168</td>
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<td>4</td>
<td>Security</td>
<td>5.338</td>
<td>1.241</td>
</tr>
<tr>
<td>5</td>
<td>Working Conditions</td>
<td>5.310</td>
<td>1.226</td>
</tr>
<tr>
<td>6</td>
<td>Congenial Co-Workers</td>
<td>4.930</td>
<td>1.291</td>
</tr>
<tr>
<td>7</td>
<td>Fringe Benefits</td>
<td>4.648</td>
<td>1.484</td>
</tr>
<tr>
<td>8</td>
<td>Advancement Opportunities</td>
<td>4.000</td>
<td>1.342</td>
</tr>
<tr>
<td>9</td>
<td>Prestige</td>
<td>3.789</td>
<td>1.330</td>
</tr>
<tr>
<td>10</td>
<td>Salary</td>
<td>3.234</td>
<td>1.368</td>
</tr>
</tbody>
</table>

\( n=71 \)
Table 4

Attractiveness Ratings of Career Factors in Public School Teaching Careers by Mathematics Students Not Pursuing Teacher Certification

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>x</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contribution to Society</td>
<td>5.236</td>
<td>1.682</td>
</tr>
<tr>
<td>2</td>
<td>Interesting Work</td>
<td>4.931</td>
<td>1.833</td>
</tr>
<tr>
<td>3</td>
<td>Security</td>
<td>4.861</td>
<td>1.656</td>
</tr>
<tr>
<td>4</td>
<td>Job Market</td>
<td>4.528</td>
<td>1.831</td>
</tr>
<tr>
<td>5</td>
<td>Congenial CoWorkers</td>
<td>4.375</td>
<td>1.294</td>
</tr>
<tr>
<td>6</td>
<td>Fringe Benefits</td>
<td>3.889</td>
<td>1.649</td>
</tr>
<tr>
<td>7</td>
<td>Working Conditions</td>
<td>3.847</td>
<td>1.692</td>
</tr>
<tr>
<td>8</td>
<td>Prestige</td>
<td>3.431</td>
<td>1.710</td>
</tr>
<tr>
<td>9</td>
<td>Advancement Opportunities</td>
<td>3.278</td>
<td>1.594</td>
</tr>
<tr>
<td>10</td>
<td>Salary</td>
<td>2.417</td>
<td>1.351</td>
</tr>
</tbody>
</table>

n=72
job market, working conditions, security, and salary, respectively.

The rank ordering of the attractiveness ratings showed striking similarity. Both groups ranked contribution to society first and interesting work second. Job market and security were ranked third and fourth by mathematics students pursuing teacher certification. Reversing this order, mathematics students not pursuing teacher certification ranked security third and job market fourth. Salary was placed in tenth place by both groups.

The mean ratings given to first year earnings showed a significant difference between the two groups. Those mathematics students not planning to become teachers expected to earn 43% more during their first year of employment than did mathematics students who were planning to become teachers. Statistics for the two groups were reported in Table 5.

Test of Null Hypotheses

Results of tests of null hypotheses were reported under headings of their respective career factors. Each null hypothesis was subjected to an "F" test for independent samples of unequal number to determine if significant differences existed between the two groups. A significance level of .05 was used as the criterion for rejecting each null hypothesis. Tables 6 and 7 show the results for the "F" test for each hypothesis.
Table 5

A Comparison of Expected First Year Earnings

<table>
<thead>
<tr>
<th>Group</th>
<th>$\bar{x}$</th>
<th>sd</th>
<th>F-Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification</td>
<td>17,049</td>
<td>2.997</td>
<td>38.4022</td>
<td>.001 *</td>
</tr>
<tr>
<td>Non-Certification</td>
<td>24,403</td>
<td>6.58294</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$  Certification n=71  Non-Certification n=72
### Table 6

**A Comparison of Importance Ratings of Career Factors in Career Choice**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Certification</th>
<th>Non-Certification</th>
<th>F-Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>4.028 1.424</td>
<td>5.167 1.454</td>
<td>22.3777</td>
<td>.001 *</td>
</tr>
<tr>
<td>Fringe Benefits</td>
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<td>4.625 1.515</td>
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* p < .05  
Certification n=71  Non-Certification n=72
A Comparison of Attractiveness Ratings of Career Factors in Public School
Teaching Careers

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* $p < .05$  Certification n=71  Non-Certification n=72
Salary

Null Hypothesis 1

There will be no statistically significant difference between the expected first year earnings of mathematics students pursuing teacher certification and the expected first year earnings of mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 1 was rejected.

Null Hypothesis 2

There will be no statistically significant difference between the importance ratings given to salary by mathematics students pursuing teacher certification and the importance ratings given to salary by mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 2 was rejected.

Null Hypothesis 3

There will be no statistically significant difference between the attractiveness ratings given to public school teaching salaries by mathematics students pursuing teacher certification and the attractiveness ratings given to public school teaching salaries by mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 3 was rejected.
**Summary of Findings Related to Salary**

Mathematics students who were not pursuing teacher certification rated salary significantly higher in importance in selecting a career than did mathematics students who were planning a teaching career. Mathematics students who were planning to teach rated teaching salaries significantly more attractive than did mathematics students who were not planning a teaching career. Mathematics students who were not pursuing teacher certification expected significantly higher (43%) first year salaries than did mathematics students who were pursuing teacher certification.

**Fringe Benefits**

**Null Hypothesis 4**

There will be no statistically significant difference between the importance ratings given to fringe benefits by mathematics students pursuing teacher certification and the importance ratings given to fringe benefits by mathematics students not pursuing teacher certification. No statistically significant difference was calculated and null hypothesis 4 was accepted.

**Null Hypothesis 5**

There will be no statistically significant difference between the attractiveness ratings given to fringe benefits in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings
of mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 5 was rejected.

Summary of Findings Related to Fringe Benefits

The two groups differed in their ratings of the attractiveness of fringe benefits in public school teaching careers. However, there was no significant difference in the ratings given to the importance of fringe benefits in making a career choice. Mathematics students who were not planning a teaching career rated the fringe benefits of public school teaching careers less attractive than did mathematics students who were planning a teaching career.

Security

Null Hypothesis 6

There will be no statistically significant difference between the importance ratings given to security by mathematics students pursuing teacher certification and the importance ratings given to security by mathematics students not pursuing teacher certification. No statistically significant difference was calculated and null hypothesis 6 was accepted.

Null Hypothesis 7

There will be no statistically significant difference between the attractiveness ratings given to security in
public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings given to security in public school teaching careers by mathematics students not pursuing teacher certification. A statistically significant difference was calculated, and null hypothesis 7 was rejected.

Summary of Findings Related to Security

There was no statistically significant difference found between the ratings given to the importance of security in making a career choice. However, the two groups differed in their ratings of the attractiveness of security in public school teaching careers. Mathematics students who were pursuing teacher certification saw teaching as a more secure profession than did mathematics students who were not pursuing teacher certification.

Job Market

Null Hypothesis 8

There will be no statistically significant difference between the importance ratings given to job market by mathematics students pursuing teacher certification and the importance ratings given to job market by mathematics students not pursuing teacher certification. No statistically significant difference was calculated between the means of the importance ratings given to job market and null hypothesis 8 was accepted.
Null Hypothesis 9

There will be no statistically significant difference between the attractiveness ratings given to job market in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings given to job market in public school teaching careers by mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 9 was rejected.

Summary of Findings Related to Job Market

There was no statistically significant difference found between the ratings given to the importance of job market in making a career choice. There was a significant difference found between the ratings of the attractiveness of job market in public school teaching careers for the two groups. Mathematics students who were not pursuing teacher certification rated the job market as less attractive for the teaching profession than did mathematics students who were pursuing teacher certification.

Working Conditions

Null Hypothesis 10

There will be no statistically significant difference between the importance ratings given to working conditions by mathematics students who were pursuing teacher certification and the importance ratings given to working conditions
by mathematics students who were not pursuing teacher certification. No statistically significant difference was calculated and null hypothesis 10 was accepted.

Null Hypothesis 11

There will be no statistically significant difference between the attractiveness ratings given to working conditions in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings of working conditions in public school teaching careers by mathematics students not pursuing teacher certification. A statistically significant difference was found between the mean ratings for the two groups and null hypothesis 11 was rejected.

Summary of Findings Related to Working Conditions

There was no significant difference found between the ratings given to the importance of working conditions in the selection of a career. A statistically significant difference was found between the attractiveness ratings of working conditions in public school teaching careers by the two groups. Mathematics students who were pursuing teaching certification rated working conditions in public school teaching careers higher than did mathematics students who were not pursuing teacher certification.
Contribution to Society

Null Hypothesis 12

There will be no statistically significant difference between the importance ratings given to contribution to society by mathematics students pursuing teacher certification and the importance ratings given to contribution to society by mathematics students not pursuing teacher certification. A statistically significant difference was found between the mean ratings of importance of contribution to society between the two groups and null hypothesis 12 was rejected.

Null Hypothesis 13

There will be no statistically significant difference between the attractiveness ratings given to contribution to society of public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings of contribution to society of public school teaching careers by mathematics students not pursuing teacher certification. A statistically significant difference was found between the mean ratings for the two groups and null hypothesis 13 was rejected.

Summary of Findings Related to Contribution to Society

A statistically significant difference was found between both the importance in career selection and the attractiveness in public school teaching careers of contribution to society by both groups. Mathematics
students who were pursuing teacher certification found contribution to society more important in career selection and more attractive in public school teaching careers than mathematics students who were not pursuing teacher certification.

**Prestige**

**Null Hypothesis 14**

There will be no statistically significant difference between the importance ratings given to prestige by mathematics students pursuing teacher certification and the importance ratings given to prestige by mathematics students not pursuing teacher certification. No statistically significant difference was calculated and null hypothesis 14 was accepted.

**Null Hypothesis 15**

There will be no statistically significant difference between the attractiveness ratings of prestige in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings of prestige in public school teaching careers by mathematics students not pursuing teacher certification. No statistically significant difference was calculated and null hypothesis 15 was accepted.

**Summary of Findings Related to Prestige**

No significant difference was found between the mean
ratings of importance or attractiveness of prestige in public school teaching careers between the two groups. Both mathematics students who were pursuing teacher certification and mathematics students who were not pursuing teacher certification rated prestige the same in importance and attractiveness in career choice and public school teaching careers.

**Advancement Opportunities**

**Null Hypothesis 16**

There will be no statistically significant difference between the importance ratings given to advancement opportunities by mathematics students pursuing teacher certification and mathematics students not pursuing teacher certification. There was a statistically significant difference calculated and null hypothesis 16 was rejected.

**Null Hypothesis 17**

There will be no statistically significant difference between the attractiveness ratings of advancement opportunities in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings of advancement opportunities in public school teaching careers by mathematics students not pursuing teacher certification. There was a statistically significant difference calculated and null hypothesis 17 was rejected.
Summary of Findings Related to Advancement Opportunities

There was a statistically significant difference found between the mean ratings of importance of advancement opportunities between the two groups. Mathematics students who were not pursuing teacher certification indicated that advancement opportunities were more important to them than did mathematics students who were pursuing teacher certification. Another significant difference was found between the mean ratings for the attractiveness of advancement opportunities in public school teaching careers. Mathematics students who were pursuing teacher certification found advancement opportunities of public school teaching careers more attractive than did mathematics students who were not pursuing teacher certification.

Interesting Work

Null Hypothesis 18

There will be no statistically significant difference between the importance ratings given to interesting work by mathematics students pursuing teacher certification and the importance ratings given to interesting work by mathematics students not pursuing teacher certification. No statistically significant difference was calculated and null hypothesis 18 was accepted.

Null Hypothesis 19

There will be no statistically significant difference
between the attractiveness ratings of interesting work in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings of interesting work by mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 19 was rejected.

Summary of Findings Related to Interesting Work

There was no significant difference found between the mean ratings of importance of interesting work between the two groups. However, a statistically significant difference was found between the mean ratings of the attractiveness of interesting work in public school teaching careers for the two groups. Mathematics students who were pursuing teacher certification considered public school teaching careers more interesting work than mathematics students who were not pursuing teacher certification.

Congenial Co-Workers

Null Hypothesis 20

There will be no statistically significant difference between the importance ratings given to congenial co-workers by mathematics students pursuing teacher certification and the importance ratings given to congenial co-workers by mathematics students not pursuing teacher certification. No statistically significant difference was calculated
Null Hypothesis 20 was accepted.

Null Hypothesis 21

There will be no statistically significant difference between the attractiveness ratings given to congenial co-workers in public school teaching careers by mathematics students pursuing teacher certification and the attractiveness ratings given to congenial co-workers in public school teaching careers by mathematics students not pursuing teacher certification. A statistically significant difference was calculated and null hypothesis 21 was rejected.

Summary of Findings Related to Congenial Co-Workers

Results indicated there was no difference in the importance of congenial co-workers between the two groups. However, mathematics students who were planning to teach rated the attractiveness of congenial co-workers in public school teaching careers higher than did mathematics students who were not planning a teaching career.

Summary of Findings

Statistically significant differences were found between the two groups on 3 of the 10 factors in terms of their importance at the time a career decision was made. Mathematics students who were not planning to become teachers rated salary and advancement opportunities higher in importance than mathematics students who were planning to become teachers. Future mathematics teachers rated
contribution to society as a greater consideration than did mathematics students entering other professions.

The two groups differed on all but one factor of the attractiveness of teaching as a career. There was no significant difference in the perception of prestige of teachers. Both groups agreed it is low. Mathematics students who were planning to become teachers consistently rated the remaining 9 factors more attractive than did mathematics students who were not planning to teach.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Growing concern for an adequate supply of competent mathematics teachers prompted this research. The purpose of this study was to generate useful data that could enhance the recruitment of future mathematics teachers. It was hoped that this data will be useful to other areas of education. The mathematics area was selected for study because it appeared to be an area where there has consistently been a shortage of teachers.

A comparison was made between two groups of mathematics students at Western Kentucky University. Mathematics students were separated according to whether or not they were pursuing teacher certification. It was assumed those who were pursuing teacher certification were planning to become teachers. The following three questions were examined:

1. Do the two groups differ in expected first year income?

2. Do the two groups differ in the importance they give to selected career factors?

3. Do the two groups differ in their perceptions of the attractiveness of the selected factors in teaching careers?
The Career Perceptions Questionnaire (McManus, 1985) was distributed to students enrolled in mathematics courses at Western Kentucky University during the Fall Semester of 1987. Usable responses were received from 143 students. Data were collected and compiled from the completed questionnaires.

Conclusions

Results from the study indicated mathematics students who were not planning to teach considered salary and advancement opportunities important career factors. However, these same students rated these items very low with regard to public school teaching careers. Students who were planning to teach rated contribution to society more important than did students who were not planning to teach. Both groups rated teaching in the public schools as not very prestigious.

Recommendations

The following recommendations were based on data and tests of null hypotheses reported in Chapter IV. It was assumed that mathematics students in this study had occupational values and perceptions of public school teaching careers similar to future mathematics students. It was further assumed these values and perceptions were consistent with students in other areas of education as well. It was hoped these recommendations would be the
basis for changes which could influence the perceptions of future students and possibly attract more of these students into mathematics teaching careers.

Recommendations are as follows:

1. It was found to be important that mathematics students perceive teaching salaries as attractive and competitive. New teachers should be able to expect at least the same starting salary as other professions. Raising all teachers salaries by the same amount would lessen the gap between existing salaries and establish beginning salaries more competitive with other careers.

2. Fringe benefits of teaching careers were rated very low by mathematics students who were not planning to teach. The need for improved fringe benefits, at least, to a level consistent with other careers was evident.

3. Working conditions were found to be of great importance to all workers; however, working conditions in public school teaching careers were seen as unattractive by mathematics students who were not pursuing teacher certification. Measures should be taken to improve the working conditions of public school teachers. Specific recommendations are: (a) computers should be made available for grading and attendance records, (b) teachers aides should be hired for extra duties, and (c) sound discipline policies should be established by school systems to relieve problems in the classroom.
4. Raising the level of prestige was found crucial if students are to be attracted to the teaching profession. Teachers must begin the process by communicating more positively to students the rewards of teaching. Also, teachers must consider themselves as professionals in order to command the respect they deserve. Public media should begin to reflect more positive attitudes concerning teachers. Unfortunately, the above will take a conscious effort on the part of the media and teachers as well.

5. Advancement opportunities must be provided in order to attract new teachers. Existing opportunities should be emphasized and new opportunities created.

6. Positive steps were clearly indicated in order to attract future teachers. New perceptions of the teaching profession must be created and communication increased. Strategies for reaching potential teachers need to be developed and implemented.
Appendix A

Route One, Box 370
Drakesboro, Kentucky 42337

Dear Mathematics Student:

You have been selected to participate in a study conducted through Western Kentucky University. The study will examine the career characteristics that are attractive to Mathematics students.

Because you are part of a selected sample, your participation is very important! Please take about five minutes to complete the questionnaire and return it to your instructor.

In the event you have already completed this same questionnaire in another mathematics course, please return the survey to your instructor without completing the questionnaire.

Thank you for your time and assistance.

Sincerely,

Rebecca Miller
Specialist Student
Western Kentucky University
Appendix B

CAREER PERCEPTIONS QUESTIONNAIRE

Are you pursuing teacher certification?___________________________

What is your major?___________________________________________

What is your minor?___________________________________________

What is your sex?  Male_____  Female_____

How much do you expect to earn the first year you are employed?  $____________________________

1. When you made your career choice, how important did you consider the following factors to be?

Please rate each factor from unimportant to important by marking the appropriate space.

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67
2. When you made your career choice, how attractive did you consider a career in public teaching?

Please rate teaching in public schools as a career in terms of the attractiveness of each of the following factors.

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