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GRADING OPTION USED BY UNDERGRADUATES AT  
MICHIGAN STATE UNIVERSITY.

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AN INVESTIGATION OF THE CREDIT-NO CREDIT  
GRADING OPTION USED BY UNDERGRADUATES  
AT MICHIGAN STATE UNIVERSITY

By

Frank M. Vivio, Jr.

A DISSERTATION

Submitted to  
Michigan State University  
in partial fulfillment of the requirements  
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1974

AN INVESTIGATION OF THE CREDIT-NO CREDIT  
GRADING OPTION USED BY UNDERGRADUATES  
AT MICHIGAN STATE UNIVERSITY

By

Frank M. Vivio, Jr.

The purpose of this study was to investigate the use of the Credit-No Credit grading option offered to undergraduates at Michigan State University. The examination consisted of two phases. In the first phase, the entire undergraduate population of Credit-No Credit Users during Fall Terms, 1968 to 1973 were classified according to class, sex, marital status and grade point average. Ten undergraduate classes were selected and majors of students within these classes were classified according to frequency of Credit-No Credit enrollment.

The second phase of the study included a survey of Credit-No Credit Users and a representative sample of undergraduates who did not choose the option. In an ancillary part of the study, teaching faculty members at Michigan State were interviewed and responses were compared to the student responses.

In the student survey, Users and Non-Users of the option were compared on eight common questionnaire items. The statistical analysis of the questionnaire was conducted using Chi-Square Analysis, Multivariate Analysis of Variance and Scheffe' Post-Hoc Contrasts.

### Findings

The results of the initial phase of the examination revealed that the percentage of Credit-No Credit Users varied between 1.3 and 3.6 percent of the undergraduate population. Seniors were the predominant users of the option, followed by Juniors, Sophomores, and Freshmen. The mean grade point average among Credit-No Credit Users was consistently higher than the mean average for Non-Users in each class, except for Freshmen. Grade point average levels for Juniors and Seniors who used the option were consistently above a 3.00, on a four point scale.

In the ten classes selected for examination, majors of students taking the class on a Credit-No Credit basis were categorized according to "Within College" and "Outside College" of declared major. The results showed that only small percentages of students take courses on this basis within the College of their major, although many students used the option to satisfy "Outside College" requirements.

Significant differences between Credit-No Credit Users and Non-Users were found on six of the eight common questionnaire items. Credit-No Credit Users as compared to Non-Users expressed:

1. less agreement with the statement that grades stimulate students to study;
2. more agreement with the statement of planning to attend a graduate or professional school;
3. more agreement with the statement that if University College courses could be taken on a Credit-No Credit basis, they would have been;
4. more agreement with the statement extending the decision to take a class on either a graded or Credit-No Credit basis;

5. less disagreement with the statement of being able to take as many courses as desired on a Credit-No Credit basis;
6. less disagreement with the statement of lowering the minimum requirements for credit from a 2.0 to a 1.0.

The reasons for significant differences may not have been due to the fact that courses were or were not taken on a Credit-No Credit basis, but because the population of Users differed from the general population of undergraduates as defined in the initial phase of the study.

In order to investigate the sources of differences between the groups, Multivariate and Univariate  $F$  tests were used with Scheffe' Post-Hoc Contrasts. Significant differences were found between Freshmen and Seniors and Freshmen and Sophomores on the item concerning grades providing a stimulus to study. Significant differences were found between Freshmen and Seniors on the item measuring plans for graduate school attendance and between Freshmen and Juniors on the item concerned with graduate school admissions officers' attitudes toward Credit-No Credit Users.

Grade point average categories were compared according to responses on the eight common questionnaire items. Significant differences were found between the middle and high groups on the item concerning plans to attend a graduate or professional school after graduation. On the item stating that students should be able to take as many courses as they wish using the option, significant differences were found between the lowest and highest and the middle and highest categories. Significant differences were found between middle and high grade point categories on the item concerned with satisfaction with grading practices.

Faculty at Michigan State expressed a more positive attitude toward the use of grades as a stimulation to study than Users and Non-Users of the option. A more negative attitude was expressed by faculty as compared to students toward extending the number of courses that could be taken on a Credit-No Credit basis.

### Conclusions

The Credit-No Credit system seems a viable option for undergraduates. The following alterations are suggested:

1. The option should be offered primarily to Juniors and Seniors;
2. A reduction of the maximum number of credits that can be taken on the grading option basis should be considered;
3. Undergraduate advisors should be made aware of reservations expressed by graduate school admittance personnel concerning this issue. They should relay this information to advisees;
4. Students should have the option of repeating a course on a regular basis after taking the course on a Credit-No Credit basis;
5. If a student desires, he should be able to receive the grade he earned in the Credit-No Credit class;
6. Prerequisites for courses taken on a CR-NC basis should be waived if agreement can be reached between the individual student and the department offering the course.

The Credit-No Credit grading option is not widely used. If slight changes were made in the two-point grading system, the Credit-No Credit option may be a more attractive grading alternative.

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## CHAPTER I

### STATEMENT OF THE PROBLEM, LIMITATIONS, DEFINITION OF TERMS, OVERVIEW

#### Introduction

In an effort to provide equitable judgments of performance of undergraduates, institutions of higher education have amended traditional grading policies. Coupled with changes in the letter or numerical grading systems has been the addition of a two point scale of grading, loosely grouped under the designations: pass-fail, pass-no credit, satisfactory-unsatisfactory and credit-no credit. The credit-no credit is similar to the pass-fail except that failure to achieve an adequate level of performance in a course does not result in a penalty to the student.<sup>1</sup> Since the pass-fail and the credit-no credit options were introduced for similar reasons, they have often been equated. The analysis of innovative grading options has been almost entirely concerned with the most widely used innovation, the pass-fail. Although there may not be an entirely different context when comparing the use of each respective system, there may be advantages of using the credit-no credit option as compared to the pass-fail option. The credit-no credit grading option was initially offered at Michigan

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<sup>1</sup>Johnathan R. Warren, College Grading Practices: An Overview. (Washington, D.C., 1971), p. 5.

State University in the Fall Term, 1968, and has become firmly established as an option available to both undergraduate and graduate students. The present study is an investigation of the undergraduate use of the Credit-No Credit grading option offered at Michigan State University.

Involved in this investigation is an appraisal of the purposes of evaluation through issuing grades, the current practice of higher education institutions.

### Statement of the Problem

Although grading practices vary among institutions of higher education, a common assumption is that achievement can be exemplified through a letter or numerical indicator. Grades are the symbols that formally indicate a student's general level of academic achievement. Evaluation consists of a variety of processes--reading papers, giving quizzes, laboratory exercises, and exams, asking questions, listening to discussions, observing the quality of student questions--by which faculty members arrive at judgments about student accomplishments.<sup>1</sup> The traditional process of grading students at the undergraduate level has both positive and negative features as a summative evaluation. According to Paul L. Dressel, grades:<sup>2</sup>

1. distinguish between students who receive credit for a course and those who do not.

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<sup>1</sup>Warren, op. cit., p. 3.

<sup>2</sup>Paul L. Dressel, Evaluation in the Basic College. (New York, 1958), pp. 136-37.

2. distinguish level of performance among those who receive credit.
3. summarize for the official record the students' enrollment and achievement in a course.
4. inform the student of his achievement in a course.
5. maintain scholastic standards by elimination of the lazy or inept.
6. motivate students through concern about low grades and satisfaction with high ones.
7. serve to discipline students.

Dressel's position, as stated in 1958, is the traditional view with respect to the beneficial aspects of grades at the undergraduate level. Colleges and universities have emphasized a philosophy featuring cognitive rationality. The superiority of communicating knowledge by a rational process has long been assumed by academia.<sup>1</sup> Given this general assumption, the grading process functions, defined by Dressel, are realistic to insure that students act responsibly in attaining academic competencies. Historically, grading was resorted to in an effort to make judgments of student performance on the basis of merit, not status; "that in doing so attempts were made to advance the democratic principles of equality of opportunity and limit the influence of family connections."<sup>2</sup>

Traditionally, one of the central functions of higher education has been to insure competency in academic areas. Although this

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<sup>1</sup>Warren Bryan Martin, Conformity: Standards and Change in Higher Education. (San Francisco, 1969), p. 217.

<sup>2</sup>Lawrence W. Hyman, "Grades and Academic Standards," City University of New York, 1969, p. 2.

position is not negated at the present time, institutions have taken on new responsibilities. In 1933, a recommendation of the American Association of University Professors stated that the "American educational system should draw a line between secondary schools and institutions of higher education clearly so as to exclude from admission to the higher institutions all persons not qualified for independent intellectual activity."<sup>1</sup> This statement does not reflect the position of most institutions in the 1970's.

In an attempt to alleviate inequalities based on "class" or financial background, colleges and universities of the 1960's and 1970's have expanded admissions. Since high school education has become nearly universal, education beyond this level has also been extended. In the future, higher education may become as universal as high school. If higher education were to admit only those who were qualified for "independent intellectual activity" and educate these people in specific academic areas, grading would present no serious drawbacks. Attendance in the academic community offers benefits to students beyond classroom learning, and with admissions being expanded, students without specific occupational goals can benefit from this experience. Living on a campus offers the student rich experiences of acquaintance and friendship, practice in human relations, natural situations for developing mutual interests and practicing conversational skills without the strain of classroom competition or the threat of

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<sup>1</sup>William Gray, Needed Readjustments in Higher Education. (Chicago, 1933), p. 95.

failure.<sup>1</sup> Less academically oriented students have been admitted to institutions of higher education so that they can participate in the total college environment. Rigid standards of academic performance are being replaced, in a number of curricular offerings, with evaluation of the "total" person. Quantitative grading procedures have been problematic in this type of evaluation. Students are evaluated, but there is difficulty in assigning a grade that is compatible with that which was "learned" in courses that stress self-development and self-awareness.

Evaluation of students has been, and will remain, a critical function of higher education. The grading procedures that are used to facilitate this process can be changed to satisfy the new responsibilities of higher education. Traditional grading practices have been faulted for:<sup>2</sup>

1. their emphasis on information rather than understanding.
2. their emphasis on competition rather than appreciation.
3. their inconsistency, i.e., different instructors use different grading standards.
4. their emphasis on quantity rather than quality.
5. deciding the fate of a student in the classroom.
6. encouraging students to stay within the security of their major area and discouraging them from exploring the academically unfamiliar.

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<sup>1</sup>Kate H. Mueller, Student Personnel Work in Higher Education. (Boston, 1961), p. 176.

<sup>2</sup>Ronnie C. Pedrini, "Pass-Fail Grading: Summary and Tentative Conclusions," ERIC No. ED 080 073, 1971, p. 2.

7. their uselessness, i.e., grades, except as predictors of future academic work, cannot be meaningfully correlated with success in life.
8. being used to regulate participation in non-academic activities, i.e., fraternities, sororities.
9. reflecting the simple skills of conformity or memory rather than creativity.

The typical criticisms of grades, stated above, provide little in the process of alleviating shortcomings. Even if errors, inconsistencies, and a false sense of accuracy are conceded, the fact remains that the wide use of one basic system, in which there is long experience, has benefits for students, faculty, administrators and society in general.<sup>1</sup> The final grade point average can be used as a referent for employment and graduate or professional school and as an indicator of intellectual ability. Grades provide information that can be evaluated on the basis of the institution providing the grades. If an institution is viewed as having high academic standards, grades are considered with more respect than grades received from a less fortunate institution. Every college or university has character in the sense that it has characteristic programs or activities by which it can be identified. Given the unique character of institutions, higher education evaluation procedures and the grading systems are unique to each institution. It is unlikely that instructors will want to give up some way of determining competence and excellence in their disciplines.<sup>2</sup> Since the use of

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<sup>1</sup>Wesley J. Dale, "Concerning Grading and Other Forms of Student Evaluation," Council of Graduate Schools in the United States, Dec. 5, 1969, p. 3.

<sup>2</sup>Hyman, op. cit., p. 2.

grades in higher education is viewed as having value, it does not seem that there will be dramatic changes in the future. Grading policy is assumed to be an integral part of the total evaluation context. Walter Moberly stated that:

The question is not whether educational institutions will have assumptions or basic values, but whether those things which motivate and direct practices will remain as unexamined presuppositions and unacknowledged commitments or will be consciously and persistently reviewed, then reaffirmed, or when necessary, changed."<sup>1</sup>

The grading assumption, placed in this context, was reaffirmed in the 1960's and 1970's and altered by many institutions through the addition of an innovative grading option. Students have been extended the opportunity to take some of their courses on a pass-fail, credit-no credit, pass-no record, or other similar options.

An important factor in academic achievement has been the capacity of students to function in stress situations. The college student is placed in an atmosphere of competition in the classroom and stress with respect to occupational possibilities and acceptance in graduate or professional school. With higher education becoming accessible, graduate school and good jobs have made the attainment of "good" grades more important than ever.<sup>2</sup> The pass-fail type grading option has been instituted to alleviate some of the faults of the traditional grading system such as the stress on competition for grades which discourages students from exploring the academically unfamiliar.

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<sup>1</sup>Martin, op. cit., p. 224.

<sup>2</sup>Dale, op. cit., p. 3.

Advocates of the pass-fail type grading option claim that the system:<sup>1</sup>

1. allows students to become more involved because they are relieved of pressure and competition.
2. allows students to take courses for the value of the cultural exposure and intellectual curiosity, without the fear of grade point average reduction.
3. relieves the enforcing aspects of traditional grading, allowing the student to mature, and demands that schools develop cognitively-consonant and academically motivating programs.
4. allows students to de-emphasize, without penalty, aspects of a course.
5. eliminates the necessity of having to "learn" how to do well on tests of individual professors.
6. removes the penalty of evaluation from the creative student who may be penalized by traditional "A" through "F" policies.

Although non-traditional grading procedures have been used at private and experimental colleges for a long period of time, the use of the supplemental grading option has become established only since the 1960's as an option used by undergraduates at a large number of colleges and universities.

Michigan State University introduced a limited Credit-No Credit Grading Option in an effort to reduce emphasis on grades. The Educational Policies Committee at Michigan State University stated,<sup>2</sup> when alterations were made with respect to the grading policies at the University, that the Credit-No Credit Option would:

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<sup>1</sup>Pedrini, op. cit., p. 3.

<sup>2</sup>"The Revised Grading System at Michigan State University," (East Lansing, Michigan, 1968), p. 11.



. . . encourage intrinsic motivation. In addition, it is intended to broaden their (students) course coverage by pursuing areas which they might not attempt if the danger of sustaining a reduction in grade point average prevailed. This system is not intended to foster reduced effort. A different environment for learning is sought, not lessening of learning. Indeed, if more enthusiastic learning does not result then the system has failed.

While this option is a part of the undergraduate program, it is questionable, according to evaluations done at a number of institutions, whether this type of option is accomplishing the purposes for which it was intended.

Michigan State University has offered the Credit-No Credit grading option to undergraduates and graduates since Fall Term, 1968. The option was a part of the revised grading policy that instituted a ten point numerical system, replacing the letter-grade marking policy.

The aim of this research is to test certain hypotheses concerned with the undergraduate use of the grading option. A six term description of the use of the Credit-No Credit system has as its main emphasis the number and type of undergraduates who have used the option. Undergraduates who have used the Credit-No Credit option during Winter Term, 1974, were surveyed and compared to a representative sample of undergraduates who did not use the option in their academic careers.

This research is an investigation of the use of the grading option at Michigan State University and an extension of knowledge of the Credit-No Credit option which had not been examined as a separate entity. The purpose of the research is concerned with the historical use of the system and with current attitudes toward grading policies held by undergraduates and by the teaching faculty. The intended results of changes made by the Educational Policies Committee are

examined to find if stated objectives of the Credit-No Credit aspect of the revised policy were being accomplished.

### Hypotheses

The entire undergraduate population of Credit-No Credit Users during Fall Terms, 1968 to 1973 were classified according to class, sex, marital status, curriculum and Michigan State University cumulative grade point average. Since Part I of the study was descriptive in nature, the "scientific"<sup>1</sup> forms of hypotheses were used. It was hypothesized that:

1. The number of undergraduates who use the Credit-No Credit Option will be consistently less than five percent of the total undergraduate population in Fall Terms, 1968-1973. (Five percent is an arbitrary figure to signify a "small proportion" of undergraduates. Because of the restrictions involved, it is hypothesized that the percentage of CR-NC users is minimal.)
2. In each of the Fall Terms described, use of the Credit-No Credit option will be directly related to ones level in college, e.g., more seniors will have chosen to use the Credit-No Credit Option than juniors, more juniors than sophomores, and more sophomores than freshmen.
3. The undergraduate Michigan State University cumulative grade point average among Credit-No Credit users will be at least 0.10 lower than the grade point averages of each respective total class.
4. Undergraduates who have used the Credit-No Credit Option will not have chosen to take courses on this basis that are in a different "College" than the one of their designated major.

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<sup>1</sup>Gene V. Glass and Julian C. Stanley, Statistical Methods in Education and Psychology. (Englewood Cliffs, New Jersey, 1970), p. 273.

For each of the above hypotheses, tables were prepared to display numbers and types of students appropriate to each of the above propositions.

For Part II of the study, 855 subjects were surveyed from the total population of 1974 Winter Term undergraduates. The major objective of the survey was to measure attitudes toward the Credit-No Credit Option and grading policies expressed by Michigan State University users and non-users of the CR-NC option. Users were defined as undergraduates who had chosen to take at least one course on this basis, non-users as those who had not used the option. These attitudes were related to other academic variables, e.g., Michigan State University cumulative grade point average and class. A major question involved in this survey was whether the attitudes of the CR-NC option users differ with regard to the above characteristics from the remainder of the undergraduate population at Michigan State. Samples were taken from the two populations defined in the following manner:

- Population 1: The full-time Michigan State University undergraduate students who used the Credit-No Credit grading option during Winter Term, 1974. Total: 1,132 students.
- Population 2: The full-time Michigan State University undergraduate students who did not use the Credit-No Credit option during Winter Term, 1974, and who had not taken courses on a CR-NC basis during their academic careers. Total: 30,176 students.

A parallel sample design was used to compare attitudes of Credit-No Credit users with non-users. For both samples, students were classified according to the following categories: four classes, and three

ranges of cumulative grade point average, namely 0.00-1.00, 2.00-2.99, 3.00 and above. Questionnaires were sent to a total of 855 undergraduates at Michigan State University. The following hypotheses were tested in the statistical analysis of the questionnaire:

5. There are significant differences between Users and Non-Users of the Credit-No Credit option as measured by the eight common Likert-type questionnaire items.
6. There are significant differences among Freshmen, Sophomores, Juniors and Seniors as measured by the eight common Likert-type questionnaire items.
7. There are significant differences among low, middle and high grade point average categories as measured by eight common Likert-type questionnaire items.

#### Common Questionnaire Items

- a. Grades tend to stimulate me to study harder.
- b. I plan to attend a graduate or professional school after I graduate.
- c. I am generally satisfied with the present grading system at M.S.U.
- d. Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.
- e. If the CR-NC option were available for University College courses, I would have taken these courses on this basis.
- f. A student should be able to decide at any time during the term whether to receive a grade or CR-NC.
- g. A student should be able to take as many CR-NC courses as he wishes.
- h. Credit in a CR-NC class should be given for a 1.0 rather than the present 2.0 minimum.

Students responded to the above items on a four point scale; strongly agree, agree, disagree, and strongly disagree.

In addition to the undergraduate questionnaires, a sample of teaching faculty members at Michigan State University were administered structured interviews concerned with aspects of the Credit-No Credit grading option. Items used in the interview were concerned with faculty member experience with students who had used the Credit-No Credit option. The following "scientific" hypotheses were used to compare faculty and student attitudes:

8. Faculty members will express a more favorable attitude than students who have and have not used the Credit-No Credit option on the item measuring whether grades stimulate students to study.
9. Faculty members will express a less favorable attitude than students who have and have not used the Credit-No Credit option as measured on a scale measuring whether students should be able to decide at any time during the term whether to receive a grade or Credit-No Credit.

The instrument also was concerned with issues such as whether the grading option should be continued and whether professors should be told which students are taking their courses on a Credit-No Credit basis.

#### Importance of the Study

The innovative grading option has become firmly established in undergraduate education. The Pass-Fail and Credit-No Credit options have been equated due to similar philosophic rationales for their initiation. The following types of innovative grading options were reported by an American Association of College Registrars and Admissions Officers survey. Percentages indicate the frequency of type of option offered among all institutions that reported use of an optional grading

option.<sup>1</sup>

Pass-Fail . . . . .	54%
Pass-No Pass . . . . .	15%
Satisfactory . . . . .	
Unsatisfactory . . . . .	10%
Credit-No Credit . . . . .	6%
Honors-Pass-Fail . . . . .	2%
Pass-D-F . . . . .	2%
Other . . . . .	11%

The pass-fail type grading options have gained nearly universal acceptance in higher education institutions. Over ninety percent of all institutions report the use of the grading option; most of these offering the option on a limited basis.<sup>2</sup> There may be differences with respect to types of students and student attitudes between the type of system that has a restrictive penalty for the undergraduate--the possibility of receiving a failing grade--and the system that does not penalize the student grade point average if minimal performance levels are not met.

Student awareness of graduate school personnel attitudes toward the innovative grading policies has not been adequately measured. The process of electing to take courses on an innovative grading option basis is one of self selection. With admissions policies a variable in this process, student knowledge of this variable could be a factor in choice making. There is reason to believe that attitudes

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<sup>1</sup>"The AACRAO Survey of Grading Policies in Member Institutions," ERIC No. ED 055 546, 1971, p. 1.

<sup>2</sup>Arvo Juola, "Grade Inflation (1960-1973): A Preliminary Report," Office of Evaluation Services, Michigan State University, 1974, p. 5.

of admissions officers are influenced negatively by academic credentials with pass-fail or credit-no credit grades.

The context of the 1960's, when the innovative grading options were adopted by most institutions, may have changed so that the pass-fail type of grading option may not be as useful an alternative to grading at the present time, though it may have been useful in the 1960's.

The Michigan State University Educational Policies Committee stated:<sup>1</sup>

If the various opinions, statements and assertions regarding grades and grading systems are transposed into questions, it is found that very few can be answered. For example: Are grades valid predictors of future academic work? Do grades accomplish desirable forms of motivation? There are many other similar questions without sufficient data to answer them . . . the relationships between the learning process and grades should be studied and factual information obtained to aid the faculty in future decisions on changing the grading system.

The present study is a description and analysis of aspects of the Credit-No Credit grading option at Michigan State University. The rationale involved in its introduction is investigated and judgments are made with reference to its relative usefulness as an alternative to traditional, multipoint grades in undergraduate programs.

### Limitations

The following is a list of limitations that affected this study:

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<sup>1</sup>"The Revised Grading System at Michigan State University," (East Lansing, Michigan, 1968), p. 32.

1. The use of the Credit-No Credit option is difficult to isolate as a variable affecting attitudes toward grading policies. There may be other variables affecting student attitudes that were not examined in this study.

2. The small number of students sampled in the "low" grade point average categories (N=11, N=10), presented difficulties in drawing inferences when comparing this group to groups in higher grade point average categories (N=135, N=134).

3. Although grade point average is a convenient tool in determination of academic achievement (as used in this study) it is inadequate as a comprehensive statement of academic achievement and student learning.

4. There is difficulty in generalizing results of a study done at one university to institutions of higher education. The intention of this study was to examine the use of a specific type of grading system, the Credit-No Credit, at Michigan State University and to provide a procedure for evaluation of similar grading options.

5. Since the process of choosing to take courses on a Credit-No Credit basis is one of self selection, random assignment of subjects to experimental and control groups (Users and Non-Users of the Credit-No Credit option) could not be considered in light of possibly affecting the academic careers of students.

6. Only undergraduates were used in this investigation. The Credit-No Credit option is offered to graduate students but it was not the intent of this research to examine graduate use of the Credit-No Credit grading option.



7. In specific courses approved by the University Curriculum Committee, a P (pass) or N (no grade) is used exclusively to evaluate student performance. It was considered beyond the scope of this research to include an investigation of these courses.

### The Michigan State University Credit-No Credit Grading System

Michigan State University employs two systems of grading: a numerical system and a supplemental credit-no credit system. To take a course under the provisions of the credit-no credit system, the student must exercise this option in accordance with the limitation of the system as described below at the time of enrollment for the term. In the credit-no credit system the following symbols are used:

CR-Credit--means that credit is granted and represents a level of performance equivalent to or above the grade point average required for graduation. Thus, undergraduates must perform at or above the 2.0 level before credit is granted; graduate students must perform at or above the 3.0 level.

NC-No Credit--means that performance was below the grade point average required for graduation; i.e., below 2.0 for undergraduates; below 3.0 for graduate students. No credit is granted.

### Administrative Procedure of the CR-NC System

1. Grades on the CR-NC system are not included in computing the term or cumulative grade point average.
2. Enrollment on a CR-NC basis is recorded with the academic adviser and with the Registrar. The instructor's class list does not indicate which students are enrolled on CR-NC basis.

3. When the course is completed, all students are graded by the instructor numerical system.
4. The Registrar then converts the numerical grades to the CR-NC basis in accord with the definitions of CR-NC stated above, but retains the numerical grades in the student's records.
5. When a student changes majors, the Registrar shall convert those letter grades to numerical grades in courses that must be graded on the numerical system in the given major.

### Enrollment in the CR-NC System

Enrollment on a CR-NC basis is optional for all undergraduate students, subject to the following conditions:

1. Course prerequisites and other criteria for enrollment in any course shall be determined by the department or college offering the course and apply equally to both the numerical and the CR-NC systems.
2. The choice of numerical or CR-NC system does not affect admission to the course.
3. All courses in every department or college are available on a CR-NC basis unless these courses are:
  - a. used to satisfy the general education requirements, or
  - b. specifically excluded from CR-NC enrollment by the department or college of the student's major or major preference, or the unit recommending the student for certification.
4. Limitation:
  - a. No undergraduate student may enroll in more than one course in a single term on the CR-NC system and may not enroll in more than a total of 30 credits in all terms.
  - b. The limitations on the number of credits a graduate student may take in a given term on the CR-NC basis and the total number of credits that may be taken in a given degree program on a CR-NC basis, shall be

established by the college, department, or degree certifying unit in which the student is a major.

5. Each department, college, or certifying unit shall designate those courses that its majors or candidates for certification cannot take on the CR-NC system.
6. Choice of the CR-NC system must be made during enrollment and may not be changed following registration except during the specified period for adding courses. Changes must be in accord with the stated procedures for change in enrollment.
7. Any course taken more than once must be repeated on the same grading system under which the course was completed the first time, except where standard requirements to the contrary must be satisfied in order to meet graduation requirements.

#### Definition of Terms

CR-NC User.--A user of the Credit-No Credit system for at least one course at Michigan State University.

CR-NC Non-User.--An undergraduate at Michigan State University who had not used the Credit-No Credit option through Winter Term, 1974.

Grade Point Average.--The grade point accumulated by each student at Michigan State University. The cumulative grade point average is the ratio of total points earned for all terms divided by the total credits carried for all terms. The numerical system consists of the following scale: 4.0 - 3.5 - 3.0 - 2.5 - 2.0 - 1.5 - 1.0 - 0.0 (from 1968 to 1972, a 4.5 and a .5 grades were used in addition to the eight points on the above scale).

Full Time Student.--A student who attempts 12 or more MSU credits in the term.

Freshmen.-- 0-40 credits.

Sophomore.--41-84 credits.

Junior.--85-130 credits.

Senior.--131-180 credits.

### Organization of the Dissertation

In Chapter II of this study, related literature pertaining to pass-fail systems is presented, followed by a brief summary.

In the third chapter, the design of the study is presented for Part I and Part 2 of the dissertation.

The fourth chapter contains the description of types of students who use the Credit-No Credit option and the statistical analyses of questionnaires.

Chapter V contains discussions of the findings and relevant recommendations and a brief summary of the study.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

One of the reasons for the initiation of an innovative grading system in the 1960's was student reaction against the traditional grading policy, one of the issues involved in the students rights movement.<sup>1</sup> Colleges, reacting to pressure, began to adopt systems considered more equitable by students and faculty; the central purpose being provision of opportunities to students for exploration beyond major areas of concentration. Grading options that theoretically allow students the opportunity to explore is presently firmly established in undergraduate education.

Universities that have an undergraduate enrollment that tends to go to graduate or professional schools have a limited number of credits that may be taken on a pass-fail basis (with few exceptions).<sup>2</sup> Although the trend is to offer the pass-fail type grading option, in most universities and colleges there are strict limitations in terms of academic background of students and number of credits that may be

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<sup>1</sup>"Education at Berkeley: A Report of the Select Committee on Education," Regents of the University of California, 1966, p. 3.

<sup>2</sup>Charles J. Quann, "Survey Shows Variation in Grading Trends," College and University Business, (September, 1970), 79.

taken on this basis. The use of a system of evaluation with the pass-fail option has increased steadily at institutions that offer an associate degree program.<sup>1</sup> Since major universities provided the lead in the initiation of innovative grading options, and since student opinion tends to favor such changes, smaller and less academically oriented institutions have changed grading policies. The pass-fail type grading option had not been instituted until recently--within the past decade-- and has not been examined in depth at most institutions. For the purposes of this review of literature, all pass-fail types of grading innovations were considered similar. The findings in the innovative grading option area indicate that the philosophic goals associated with initiation of this type of option are not being met. The review was concerned with student achievement using the pass-fail type option and the ramifications of taking courses on this basis upon student admission to graduate studies and to areas of employment.

#### Student Achievement Using The Innovative Option

The two point grading option could have a negative effect upon student learning and lower grades could be the result of taking courses on a pass-fail basis. Gold, et al., selected Freshmen and Juniors with high, medium and low Scholastic Aptitude Test scores and gave an experimental group of Freshmen the option of using the pass-fail evaluation in their courses. Instructors were not given

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<sup>1</sup>"The AACRAO Survey of Grading Policies in Member Institutions," ERIC No. ED 055 546, 1971.

information as to which students were taking classes on this basis. The mean grade point average for the experimental group of Freshmen in the semester following pass-fail use was 2.28, significantly lower than the 2.72 average for the control group Freshmen that were initially given conventional grades.<sup>1</sup> Table 1 displays the results of this follow-up with conventional grades. Table 2 represents results for the Junior group.<sup>2</sup> Although the authors contend that after

Table 1. Mean grade submitted for college freshmen taking all courses on a pass-fail basis.

SAT Verbal Score	Experimental GPA*	N	Control GPA	N
580-785	1.55	9	2.53	8
511-579	1.36	7	2.14	13
379-499	1.91	13	2.15	6
All Ss	1.67	29	2.26	27
FIRST FOLLOW UP SEMESTER WITH CONVENTIONAL GRADES				
All Ss	2.28	22	2.72	24
SECOND FOLLOW UP - FALL SEMESTER OF JUNIOR YEAR				
All Ss	2.68	18	2.85	20

\*GPA's for the Experimental group were grades submitted prior to conversion to pass-fail.

<sup>1</sup>Richard M. Gold, et al., "Academic Achievement Declines Under Pass-Fail Grading," Journal of Experimental Education, (Spring, 1971), 19.

<sup>2</sup>Gold, et al., op. cit., p. 19.

Table 2. Mean grade submitted for students taking one course on a pass-fail basis vs. students taking all course work traditionally.

SAT Verbal Score	Experimental GPA*	N	Control GPA	N
580-785	1.85	25	2.22	20
511-559	1.69	24	1.85	24
379-499	1.47	22	1.48	21
All Ss	1.67	71	1.83	65

\*GPA's for the Experimental group were grades submitted prior to conversion to pass-fail.

returning to the conventional system of grading, former pass-fail students continue to receive lower grades (Table 1), the small sample used was inadequate to generalize results to all innovative grading options.

In a long range evaluation of a pass-fail system at the University of Illinois, attitudes concerned with the use of the grading option expressed by a sample of 463 undergraduates in biology and geography classes were assessed. Data from the questionnaire showed that students spent less time with pass-fail courses than with the remainder of the courses in which they were enrolled. If the pass-fail students had been credited with the grade assigned before conversion to a pass or a fail, they would have averaged approximately .70 of a letter grade below the grade of their classmates graded with the traditional system. The author concludes that students do not work as hard in their pass-fail courses and that a grade system seems



necessary for academic achievement. Stallings projects that some students are not mature enough to be concerned with learning for its own sake and not for the sake of a grade point average.<sup>1</sup>

Vernon states that the extrinsic motivation provided by a course grade appears to have a powerful effect on the effort put forth and thereby upon the level of achievement.<sup>2</sup>

In a study at Brandeis University, sixty students from each undergraduate class who had used the pass-fail option were chosen and grade point averages of these students in these courses were compared with the grade point averages of each class. Table 3 displays the differences in grade point average by class.<sup>3</sup>

Table 3. Grade point average in pass-fail courses and in whole class by class.

Class	GPA-Pass-Fail	GPA of Class
Senior	3.28	3.26
Junior	2.63	3.16*
Sophomore	2.64	3.12*
Freshmen	2.34	2.90*

\*Significant at .01 level.

<sup>1</sup>William M. Stallings, "The Pass-Fail Grading Option at a State University: A Five Semester Evaluation." Journal of Educational Measurement, (Fall, 1971), 153.

<sup>2</sup>Walter M. Vernon, "Evaluated and Non-Evaluated in Higher Education," ERIC Reports, Illinois State University, April, 1972, p. 6.

<sup>3</sup>Sgan, op. cit., p. 640.

It appears that there may be few students at the freshman or sophomore level who display academic maturity and responsibility. Students who display such characteristics usually do well within a traditional grading system.

Students generally favor a pass-fail system of grading and this attitude was found in all studies done of students who had taken courses on this basis. In an assessment of student attitudes toward grading practices, Stallings found a generally negative attitude toward conventional grading systems. There was homogeneity of responses across institutions, across classes within institutions and across colleges of one institution.<sup>1</sup>

Student anxiety concerning grades may be the major reason for the favorable attitude toward the option. Stallings and Leslie indicate that:<sup>2</sup>

The undergraduate perceives grades as that proverbial sword hanging over his head which forces him to study content he otherwise might not study. The power of the 'grade' is strong enough to restrict his studying to material which he anticipates will be on tests. In most cases this material is factual, regardless of the level of the instructor's objectives. If he should happen to stray from factual material and become somewhat imaginative, the student expects his efforts to go unrewarded. Once a grade is received, it is not perceived as feedback. Pressure amounts and can lead to cheating.

Students reported that the relaxed atmosphere in the classroom in which the pass-fail option was used was one of the major reasons why

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<sup>1</sup>William M. Stallings, "Pass-Fail Grading Option," School and Society, (March, 1968), 179.

<sup>2</sup>William M. Stallings and Elwood K. Leslie, "Student Attitudes Towards Grades and Grading," Improving College and University Teaching, Vol. 18, p. 67.

they took courses on this basis.<sup>1</sup> Students indicate, however, that grades provide extrinsic motivation to do assigned coursework.<sup>2</sup> Since grades have been an overriding concern to the individual student since his initial efforts in an academic situation, the pass-fail type of option can be viewed as an escape from the anxiety associated with grades that had been experienced in the past. At Washington University students opted for pass-fail grading because of grading pressures and lack of time while discounting the concepts of pass-fail use because of course difficulty, lack of prerequisites or to accommodate an overload.<sup>3</sup> Since a student's future is partly determined according to the grades he had received in the past, an escape from these pressures is seen as beneficial. At the University of California at Berkeley the pass-fail option was used by students with above average academic scores who were fearful of earning a "C" grade.<sup>4</sup> With pressures mounting for admission to graduate or professional schools, students have attempted to attain the highest grade point possible, and therefore use the pass-fail type option to take courses in which they may receive a low grade.

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<sup>1</sup>A. J. Magoon and R. Barker Bausell, "Comparing Pass-Fail Options Against Traditional College Grading," College Student Journal, (Feb., 1992), 72.

<sup>2</sup>William M. Stallings and Richard M. Smock, "Pass-Fail Grading Option," School and Society, (March, 1968), 180.

<sup>3</sup>Charles J. Quann, "The Pass-Fail Option: Analysis of an Experiment in Grading," American Association of College Registrars and Admissions Officers, April 27, 1971.

<sup>4</sup>Sidney Suslow, "Pass-Fail Grading at Berkeley: Facts and Opinions," ERIC Reports, Office of Institutional Research, (California University, February, 1973), p. 73.

Effects of Taking Courses  
on a Pass-Fail Basis

There are ramifications of taking courses using the grading option upon the transfer process to graduate and professional schools. Graduate school admissions personnel indicate that the use of the pass-fail option presents a dilemma in graduate student selection and that emphasis upon the standardized tests for a criteria of judgment is predominant in cases where students have elected to take a large number (over 10 percent) of courses on a pass-fail type basis.<sup>1</sup> The pass-fail system may present a problem to the potential graduate student that may outweigh its advantages. The serious student as an undergraduate is likely to be concerned with his future in graduate school. The American Association of College Registrars and Admissions Officers Report in 1971, to determine the nature and extent of changes from the traditional grading systems, found that 44 percent of institutions reported that they disregard the pass-fail grades of transfer students. The more traditional colleges in the area of grading were the small institutions with an enrollment of less than 1,000. In institutions of 20,000 or more, the rate of use of a pass-fail type system was 96 percent. A total of 26 percent of the graduate schools that responded indicated that admission to their programs is either jeopardized or delayed by the presence of a substantial number of pass-fail credits.<sup>2</sup>

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<sup>1</sup>"Law School Admissions Test Council Statement on Pass-Fail Grading Systems as Endorsed by the Council of the Section of Legal Education and Admissions to the Bar of the American Bar Association," ERIC Reports, (Oct. 27, 1970), p. 4.

<sup>2</sup>"The American Association of College Registrars and Admissions Officers Survey of Grading Policies in Member Institutions," op. cit., p. 5.

A Council of Graduate Schools Questionnaire reported that 93 percent of graduate deans preferred to evaluate student applicants on the basis of grades while only three percent preferred to evaluate on the basis of pass-fail grading. Eighty-eight percent of the deans indicated that the Graduate Record Examination would be more heavily considered if a student had a "number" of pass-fail reports on his record.<sup>1</sup>

There may be difficulty in gaining employment of a student who had used the innovative grading policies during his undergraduate career. Robert L. Bailey presents the following summary with regard to a number of surveys completed by employers and representatives of government agencies.<sup>2</sup>

1. Business had not fully accepted the innovative concept of non-traditional grading.
2. Prior business experience remains the principal criteria in the hiring of applicants by industrial firms. Undergraduate grades and the reputation of the university are important in the hiring of the undergraduate directly from the university.
3. Government agencies rely chiefly upon Civil Service examinations in the hiring of personnel. Where examinations or test scores are not the sole criteria in the selection process, previous experience and undergraduate grades are important criteria in selecting employees.

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<sup>1</sup>William W. Hassler, "Results of a Pass-Fail Questionnaire Sent to Graduate Deans," ERIC Reports, (Indiana University of Pennsylvania, 1969), p. 3.

<sup>2</sup>Robert L. Bailey, "A Report of the Sub-Committee to Survey the Acceptance of Non-Traditional Grading Patterns by Government, Industry and/or Graduate Institutions," ERIC No. ED 062 916, p. 22.

The process of electing to take courses on a credit-no credit basis is one of self-selection with admissions policies a variable in this process. Student knowledge of this variable could be a factor in choice making. Students may realize that admission to graduate schools is a selective process, but they may not realize the negative ramifications of taking courses using the innovative grading option. Although grades are not the only criteria for admission to graduate and professional schools or for employment, they are an integral part of the selection process. If students had a high grade point average and had taken some courses using the grading option, the grade point averages would not be considered as reliable statements of student capabilities. The grade point average appears to be seen as having little reliability if a student took his hardest courses on a pass-fail basis.<sup>1</sup>

Although undergraduates tend to favor a less quantitative grading system, there may be negative ramifications of using the innovative grading option that may not be beneficial to the students.

#### Summary

The innovative, pass-fail type grading option has a number of shortcomings that may outweigh its projected advantages. Although there have been a number of studies testing the assumptions of this grading policy, a long range study of the variation of the pass-fail

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<sup>1</sup>Sidney J. Clauch, "Effects of Pass-Fail Grading on Quality Grade Point Averages," College and University, (Winter, 1972), 104.

option, the credit-no credit system, is needed to find whether there are substantial differences between the types of options. The status of the innovative grading options can be considered in light of the following conclusions derived from a review of recent literature:

1. Fundamental premises for initiation of the pass-fail type option are not being realized. Students elect to take courses on this basis not to explore outside their major area but to relieve themselves of the burden of concentrated effort.
2. The pass-fail type of grading option may be appropriate at the upper levels of undergraduate education. The mature individual can take advantage of this system for legitimate reasons while the less serious student appears to use the system for less constructive purposes.
3. Students favor the innovative grading options but not to the extent that grades should be abolished completely.
4. Students who have been exposed to traditional classroom instruction with conventional grading find difficulty in the transition to a pass-fail type grading procedure. Without extrinsic motivation to attain high grades, many students do not concentrate on learning course materials to the same degree as if they were being graded.
5. Graduate school admission policies are slightly discriminatory against students who have taken courses using the innovative grading option. It is questionable whether students are fully aware of the negative ramifications of the pass-fail grades.

The review of literature indicated need for an examination of the credit-no credit type system that has often been equated with the pass-fail system. The Credit-No Credit option as a separate entity has not been examined in depth.

## CHAPTER III

### DESIGN OF THE STUDY

Two independent studies were conducted to investigate the Credit-No Credit grading option. The first phase of the research was descriptive in nature dealing with numbers and type of students who had used this type of grading option. The second phase of the study was inferential and included statistical analysis of questionnaires administered to undergraduates at Michigan State University.

For Part I, students were categorized according to class level, sex, major and Michigan State University grade point average. All undergraduates who had used the grading system during Fall Terms, 1968 to 1973 were included in this compilation, all graduate students being deleted.

Part II of the design included questionnaires designed to sample student opinions concerning the Credit-No Credit grading issue and the grading process in general. An ancillary facet of the study included a structured interview administered to a sample of teaching faculty members at Michigan State University.

Past studies had shown that the use of a pass-fail system by undergraduates had resulted in lower grade point averages among users as compared to non-users. Users and non-users are compared in both parts of this study. Present attitudes toward grading practices



expressed by undergraduates were assessed and relationships among users and non-users of the Credit-No Credit option were analyzed.

### Part I

All undergraduates at Michigan State University who had used the Credit-No Credit option during Fall Terms, 1968 to 1973, were categorized according to class level, sex, marital status, major and cumulative grade point average. Each Fall Term was treated as a separate entity since some students could have taken a Credit-No Credit class in more than one Fall Term. The concern was with the actual number of students who had used the option in each of the respective terms. Total numbers of students who had used the Credit-No Credit option during Fall Terms and numbers of students by sex and marital status were compiled. Figures 1 and 2 are schematic representations of the design for this aspect of the study. Figure 3 represents the percent of the total population of undergraduate students at Michigan State who have used the Credit-No Credit option in each of the Fall Terms. Figure 4 is a schematic representation of the categorization of CR-NC Users by class for each of the Fall Terms. Class percentages of Users are for each of the Fall Terms separately. Figure 5 represents the categorization of CR-NC Users by grade point average for each of the Fall Terms. The CR-NC Users grade point average is compared to the All-University grade point average. Figure 6 is a schematic representation for four tables in which CR-NC Users are categorized by grade point average and class. The CR-NC Users grade point average is compared to respective class grade point average.

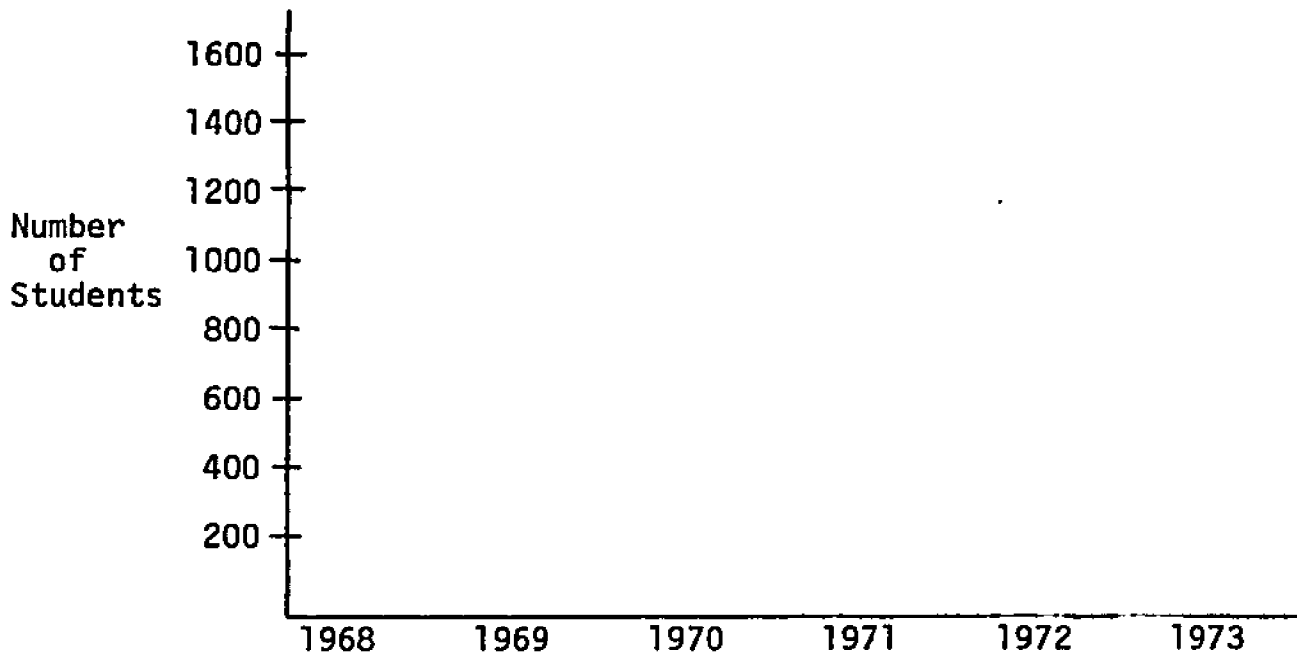


Figure 1. Total number of undergraduates who had used the CR-NC option.

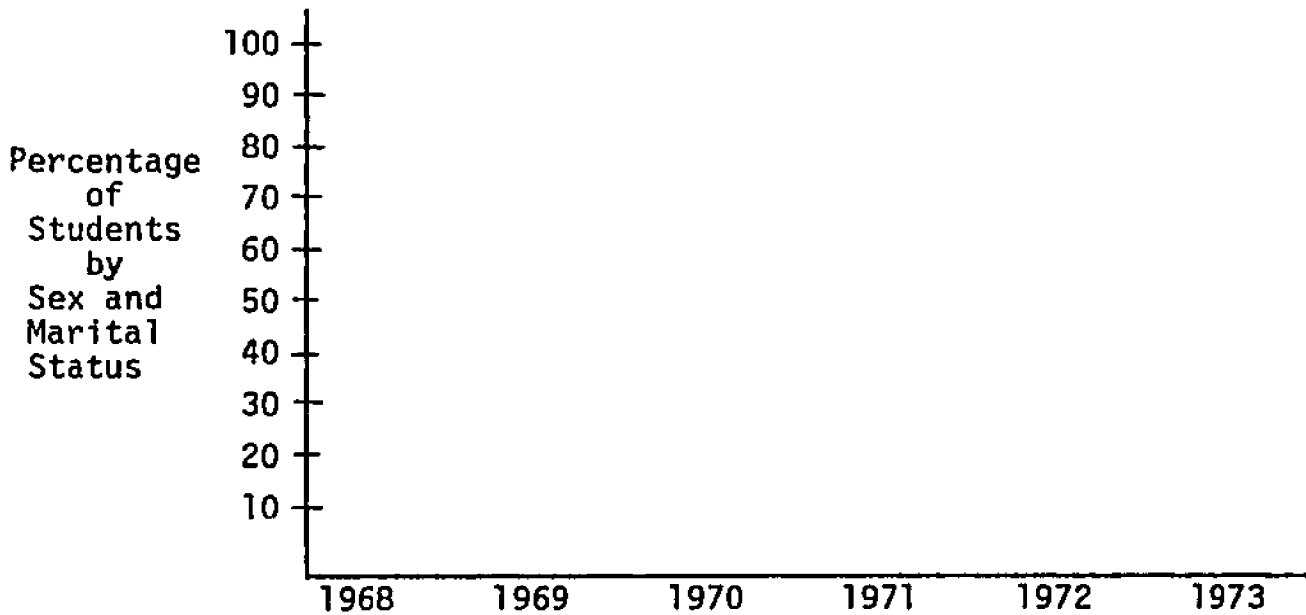


Figure 2. Percentage of undergraduates who had used the CR-NC option by sex and marital status.

Fall Term	Total Number of Undergraduates	Total Number of CR-NC Users	Percentage of CR-NC Users
1968			
1969			
1970			
1971			
1972			
1973			

Figure 3. Number and percentage of CR-NC users in comparison with the total number of undergraduates.

Fall Term	Freshmen	Sophomore	Junior	Senior
1968				
1969				
1970				
1971				
1972				
1973				

Figure 4. Percentage of CR-NC users by class by year.

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.5 above	CR-NC GPA	University GPA
1968							
1969							
1970							
1971							
1972							
1973							

Figure 5. Percentages of CR-NC users in grade point average categories, mean grade point average of CR-NC users, all-university grade point average.

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.5 above	CR-NC GPA	Class GPA
1968							
1969							
1970							
1971							
1972							
1973							

Figure 6. Percentages of CR-NC users by class in grade point average categories, mean grade point average of CR-NC users, class grade point average, Freshmen through Seniors.

A common assumption among advocates of an innovative grading option is that it will encourage undergraduate students an opportunity to explore courses outside their major areas of concentration.<sup>1</sup> Figure 7 represents ten tables that present numbers and type of students according to declared majors in ten selected classes. These specific classes were chosen for description due to their diversity and the relatively large number of students who had chosen to take these classes on a Credit-No Credit basis. These tables represent the total number of students in all of the Fall Terms, 1968 to 1973, and their declared majors. Figure 7a represents ten tables containing percentages of within college majors and outside college majors for each course. The courses examined were:

Introductory Physics  
 Introduction to Economics  
 History of Western Art  
 Psychology of Personality  
 Individual Sports  
 Survey of Accounting Concepts  
 General Anatomy  
 College Algebra and Trigonometry  
 Elementary Russian  
 Second Year French

### Part II

Two questionnaires were prepared to sample student opinions concerning areas of grading and the use of the Credit-No Credit grading option.\* The objectives of this survey were to measure attitudes

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<sup>1</sup>Pedrini, op. cit., p. 3.

\*Both questionnaires are presented in Appendix A.

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<u>Declared Major</u>	<u>Number of Students in Six Terms</u>
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Figure 7. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

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<u>Course Title</u>	<u>Percentage of Within Major Students</u>	<u>Percentage of Outside Major Students</u>
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Figure 7a. Percentage of students taking course within and outside of declared major.

of Michigan State University undergraduates who had chosen to take one course or more on a CR-NC basis and to measure attitudes of those students who had not taken a course using this option.

### Definition of Terms

Element.--The individual undergraduate student

Population.--a) The full-time Michigan State University undergraduate students who used the CR-NC grading option during Winter Term, 1974; b) The full-time Michigan State University undergraduate students who did not use the CR-NC grading option while at Michigan State.

Survey Population.--a) The 1,132 CR-NC Users during Winter Term; b) The 30,176 undergraduates who did not use the CR-NC option.

Sampling Frame.--The magnetic tape containing listing of undergraduate students who have and who have not taken courses using the CR-NC grading option during Winter Term, 1974.

Variables.--a) Michigan State University cumulative grade point averages in the following categories: 0.00-1.99, 2.00-2.99, 3.00 and above; b) Class: Freshmen, Sophomore, Junior, Senior.

### Sampling Design

A parallel sample design was used to generate samples of CR-NC Users and Non-Users. For the Non-User sample, a systematic sample of students was taken through generating a list using the student records magnetic tape. Every one-hundredth student was chosen, beginning at a random point, and those students who had a CR-NC course on their

records were deleted. From the resulting list of 451 students, all graduate students were deleted. The final sample contained 401 undergraduates. This representative sample of undergraduates was post-stratified according to the three grade point average categories. Wide ranges within categories were used so that student respondents would not be forced to categorize themselves according to very specific grade point levels. Class level of each subject in the sample was discerned from the original list of undergraduates.

For the Credit-No Credit Users sample, the total population was stratified and sampled in the following manner:

<u>Class</u>	<u>GPA</u>	<u>Number in Population</u>	<u>Number in Sample</u>	<u>Percentage of Sample/Population</u>
Freshmen:	0.00-1.99	17	17	100%
Freshmen:	2.00-2.99	45	45	100%
Freshmen:	3.00 above	42	42	100%
Sophomore:	0.00-1.99	2	2	100%
Sophomore:	2.00-2.99	49	49	100%
Sophomore:	3.00 above	98	49	50%
Junior:	0.00-1.99	1	1	100%
Junior:	2.00-2.99	116	58	50%
Junior:	3.00 above	218	55	25%
Senior:	2.00-2.99	172	43	25%
Senior:	3.00 above	372	93	25%
TOTALS:		1,132	454	40%



The questionnaires and cover letters\* were sent to a total of 855 students as defined in the above sampling procedures. Fifteen days following the mailing, a second copy of the questionnaire and cover letter\*\* were sent to the non-respondents. Sixteen questionnaires were returned unopened. Twenty-five days after the follow-up letter was sent, it was assumed that more responses would not be forthcoming. The total number of respondents was 627, a response rate of 75 percent. The response rate for the Credit-No Credit User questionnaire was 77 percent; the response rate for the systematic sample of Non-Users was 72 percent. For the statistical analysis a total of 622 returned questionnaires were used due to the incompleteness of five of the total. The total number (627) of respondents was used in the percent frequency counts for both questionnaires, the initial analysis. Figure 8 represents two tables presenting percent frequency counts for both samples.

There were eight items that were identical in both questionnaires so that comparisons could be made between CR-NC Users and Non-Users. To test whether there were significant differences between Users and Non-Users of the CR-NC option, a Chi-Square analysis<sup>1</sup> was used. Figure 9 is a schematic representation of the Chi-Square Analysis. The alpha level for all tests of significance was .05.

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\*Both cover letters are presented in Appendix B.

\*\*The second cover letter is presented in Appendix C.

<sup>1</sup>Earl R. Babbie, Survey Research Methods (Belmont, California: Wadsworth Publishing Company, 1973), pp. 308-314.

	(N=346)			(N=281)		
	<u>No Response</u>	<u>Strongly Agree With The Statement</u>	<u>Agree With The Statement</u>	<u>Disagree With The Statement</u>	<u>Strongly Disagree With The Statement</u>	<u>Don't Know</u>
Item 1						
.						
.						
.						
.						
.						
Item n						

Figure 8. Questionnaire response percent frequency counts.

<u>Items 1 - 8</u>	<u>USER</u>	<u>NON-USER</u>
Strongly Agree		
Agree		
Disagree		
Strongly Disagree		
Total		
Chi-Square Value		

Figure 9. Chi-square analysis of eight questionnaire items.

To test whether there were significant differences by class and by grade point average categories on each of the eight items, the Univariate and Multivariate Analysis of Variance<sup>1</sup> was employed. Two separate multivariate analyses were used, a four by two way design with eight dependent measures, the independent variables being class, freshmen through senior, and CR-NC Users and Non-Users; a three by two design with eight dependent measures, the independent variables being the grade point average categories and Credit-No Credit Users and Non-Users. The Schematic representations of the Multivariate Designs are presented in Figures 10 and 11. Scheffe' Post-Hoc<sup>2</sup> comparisons were used to determine which combination of means contributed to significance of the Univariate F test.

An ancillary part of this research was a questionnaire\* administered to teaching faculty members through a telephone interview.

Two faculty members were chosen from each department that offered undergraduate classes. The sampling frame was the listing of faculty and staff. The initial sample contained sixty-nine faculty members. Nine of the total were found to be non-teaching faculty. Out of the remaining sixty teaching faculty members, fifty were contacted and this number completed the telephone interview. Since the

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<sup>1</sup>Jeremy D. Finn's Multivariate, Modified for use on the CDC 6500, by Office of Research Consultation, Michigan State University.

<sup>2</sup>Gene V. Glass and Julian C. Stanley, Statistical Methods in Education and Psychology (Englewood Cliffs, N.J.: Prentice-Hall, 1970), pp. 388-93.

\*The faculty questionnaire is presented in Appendix D.

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	CR-NC USER				NON-USER			
	<u>Fresh- men</u>	<u>Sopho- more</u>	<u>Jun- ior</u>	<u>Sen- ior</u>	<u>Fresh- men</u>	<u>Sopho- more</u>	<u>Jun- ior</u>	<u>Sen- ior</u>
Item 1								
.								
.								
.								
.								
.								
.								
Item 8								

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Figure 10. Univariate and multivariate analysis of variance, class by CR-NC user and non-user.

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	CR-NC USER			NON-USER		
	<u>0.00-1.99</u>	<u>2.00-2.99</u>	<u>3.00 above</u>	<u>0.00-1.99</u>	<u>2.00-2.99</u>	<u>3.00 above</u>
Item 1						
.						
.						
.						
.						
.						
.						
Item 8						

---

Figure 11. Univariate and multivariate analysis of variance, grade point average category by CR-NC users and non-users.

format of the questionnaire was different than the instruments given to students, it was treated as a separate entity. Some of the items in the telephone interview were similar to the mailed student questionnaires and a discussion of these responses included a non-statistical comparison. Individual faculty responses were included to present an indication of faculty attitudes toward the innovative grading option. Percent frequency counts were calculated for the individual interview items.

## CHAPTER IV

### PRESENTATION OF FINDINGS

Chapter IV contains a presentation of the results of the study. The first part of the chapter is a presentation of the description of the six term use of the CR-NC grading option. Hypotheses 1 through 4 are presented, tables were prepared, and each hypothesis is discussed. Following the initial descriptive part of the study, hypotheses 5a through 7h were tested and inferences drawn. Throughout this chapter a description of the types of students who used the CR-NC option, and a description of the questionnaire respondents are included. The findings concerning hypotheses 8 and 9 are presented, followed by a brief summary.

#### Part I

Four hypotheses were presented with reference to the descriptive aspect of the study.

#### Hypothesis 1

The number of undergraduates who use the Credit-No Credit option will be consistently less than five percent of the total undergraduate population in Fall Terms, 1968 to 1973.

Total numbers of Credit-No Credit Users in Fall Terms, 1968 to 1973 are presented in Figure 12. Figure 13 is a presentation of CR-NC Users in the Fall Terms, according to sex and marital status.

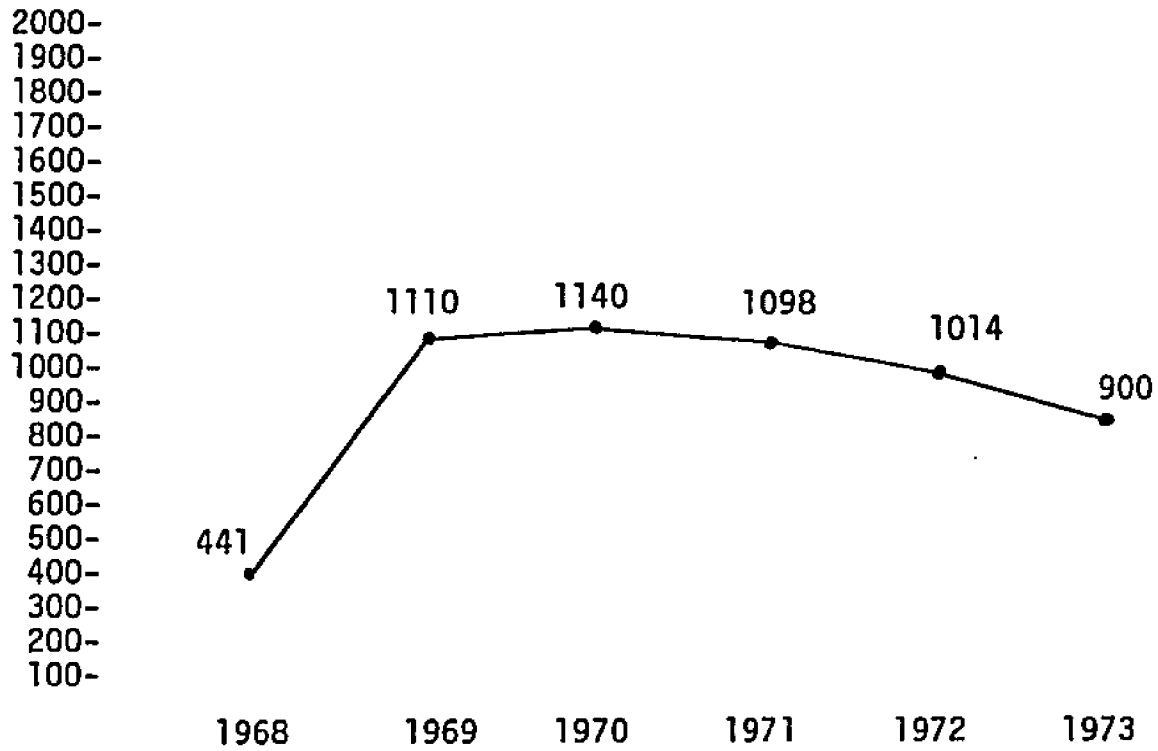


Figure 12. Total numbers of undergraduate CR-NC users in six fall terms.

Male	.....	55.3	.....	53.0	.....	47.7	.....	47.5	.....	42.3	.....	39.3
Female	- - -	37.4	- - -	41.8	- - -	41.1	- - -	42.0	- - -	47.3	- - -	51.1
Married Male	- . - . - .	5.4	- . - . - .	2.1	- . - . - .	6.2	- . - . - .	6.9	- . - . - .	6.1	- . - . - .	5.4
Married Female	_____	1.8	_____	3.2	_____	4.9	_____	3.6	_____	4.2	_____	4.1

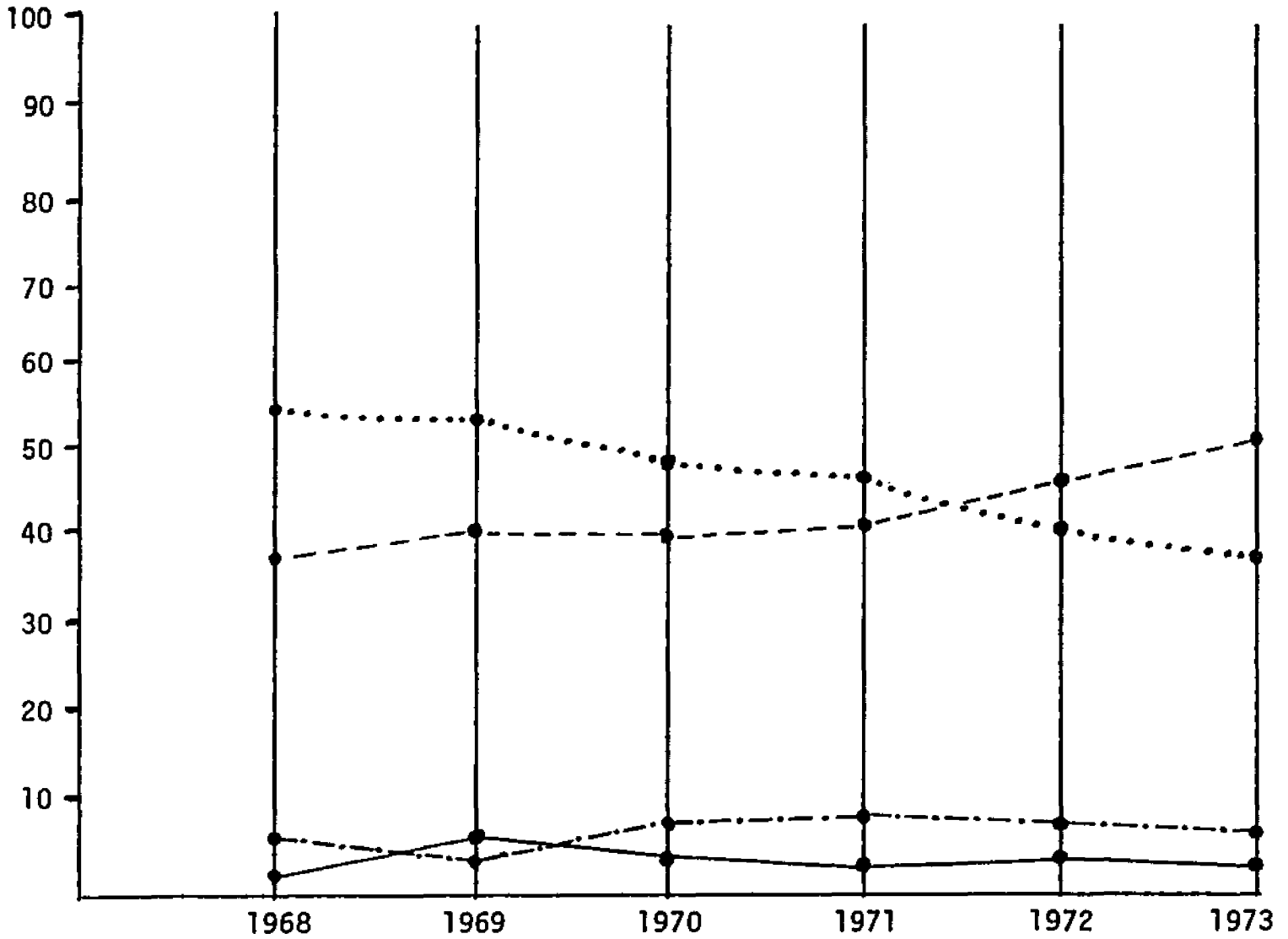


Figure 13. CR-NC users by sex and marital status in six fall terms.



Table 4 is a presentation of the percentage of undergraduates who have used the CR-NC option in each of the Fall Terms. For the total number of undergraduates, Agricultural Technology and English Language Center students were deleted.

Table 4. Percentage of CR-NC users in total undergraduate population.

Fall Term	Total Number of Undergraduates	Total Number of CR-NC Users	Percentage of CR-NC Users
1968	31,761	441	1.3%
1969	32,205	1,110	3.4%
1970	31,613	1,140	3.6%
1971	33,025	1,098	3.4%
1972	32,803	1,014	3.1%
1973	32,777	900	2.7%
TOTAL	194,184	5,703	2.9%

The percentage of Credit-No Credit Users in each of the six terms ranged from 1.3 percent to 3.6 percent, consistently less than the 5 percent hypothesized. Following Fall Term, 1968, the first term the option was offered, the relatively consistent percentage of CR-NC Users was approximately 3.0 percent. The trend line presented in Table 4 displays that the use of the option has been slowly decreasing from the high point of 1970. Figure 13 displays consistency by marital status with reference to CR-NC use, however, the percentage of males using the option has fallen below the percentage of females for the past two Fall Terms. The number of female Users has remained relatively consistent throughout the six terms.

Hypothesis 2

In each of the Fall Terms described, use of the Credit-No Credit option will be directly related to ones level in college, e.g., more seniors will have chosen to use the Credit-No Credit option than juniors, more juniors than sophomores, and more sophomores than freshmen.

Number of students and percentage of each class that used the option in each annual Fall Term are presented in Table 5. Percentages by class are for each Fall Term separately. Total numbers and percentages for all terms are presented.

Table 5. Number and percentage of CR-NC users by class by year.

Fall Term	Freshmen		Sophomore		Junior		Senior	
	No.	%	No.	%	No.	%	No.	%
1968	12	2.7%	96	21.8%	133	30.2%	200	45.4%
1969	43	3.9%	198	17.8%	380	34.2%	489	44.1%
1970	21	1.8%	156	13.7%	336	29.5%	627	55.0%
1971	38	3.5%	166	15.1%	379	34.5%	515	46.9%
1972	35	3.5%	166	16.4%	325	32.1%	488	48.1%
1973	32	3.6%	133	14.8%	295	32.8%	440	48.9%
TOTAL:	181	3.2%	915	16.0%	1848	32.4%	2759	48.4%

The percentage of seniors who used the CR-NC option were consistently higher than the percentage of juniors, followed by sophomores and freshmen. Nearly half of the total number of CR-NC users were seniors. The table shows that the largest percentage of seniors

to use the option was 1970, the last year males (Figure 13) were predominant users of the grading option. The largest variation within classes was among seniors, juniors showing the most consistency for the Fall Terms among the three upper classes. The high point of CR-NC use by seniors was 1970. This Fall Term had the lowest percentage of sophomore users of the option. Other Fall Terms showed relative consistency by class.

### Hypothesis 3

The undergraduate Michigan State University cumulative grade point average among Credit-No Credit Users will be at least 0.10 lower than the grade point averages of each respective class.

Table 6 displays the categorization of CR-NC Users by grade point average for each of the Fall Terms. The mean CR-NC grade point average was compiled for Users and compared to the All-University grade point average for each respective term. For the total, the grade point average for Users was compiled and compared to the mean of the All-University average for the six terms. The percentages for each grade point average category are separated by term.

As indicated by Table 6, the total grade point average of CR-NC Users has been consistently higher than the All-University average. The largest percentage of CR-NC Users lies in the 3.00-3.49 category, followed by the 3.50 above category except for 1969 when the second highest was 2.50-2.99.

Hypothesis 3 was concerned with the comparisons by grade point average by class. Tables 7 through 10 present percentages of

Table 6. Percentage of CR-NC users in grade point average categories, mean grade point average of CR-NC users, all-university grade point average.

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50 above	CR-NC GPA	All-University GPA
1968	3.4%	15.4%	25.2%	30.0%	26.1%	2.99	2.49
1969	2.1%	16.1%	25.0%	33.2%	23.6%	3.01	2.55
1970	1.1%	11.8%	26.1%	34.1%	27.0%	3.08	2.62
1971	3.6%	10.2%	23.1%	36.9%	26.0%	3.02	2.72
1972	3.7%	9.3%	22.1%	34.3%	30.6%	3.05	2.72
1973	5.0%	7.8%	23.7%	38.8%	24.8%	2.99	2.75
GPA TOTALS						3.03	2.63

CR-NC Users in grade point average categories by Term. The mean grade point averages were compared to the mean grade point averages for each class for each Fall Term.

Table 7. Percentage of CR-NC users in grade point average categories, mean grade point average of CR-NC users, class grade point average: Freshmen. (N = 180)

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50 above	CR-NC GPA	Freshmen GPA
1968	41.7%	25.0%	25.0%	8.3%	0.0%	2.13	2.36
1969	12.0%	19.0%	31.0%	31.0%	7.1%	2.69	2.32
1970	14.3%	19.0%	28.6%	14.3%	24.0%	2.66	2.51
1971	65.8%	13.2%	5.3%	10.5	5.3%	1.09	2.54
1972	60.0%	5.7%	17.1%	11.4%	5.7%	1.41	2.57
1973	72.0%	3.1%	9.4%	12.5%	3.1%	0.83	2.59
GPA TOTALS						1.75	2.48

Table 7 indicates that the grade point average for CR-NC Users was higher than the Freshmen class average in Two Terms, 1969 and 1970. The total number of freshmen in the three lowest grade point average terms, 1971, 1972, and 1973 was 38, 35, and 32 respectively (Table 5). The largest percentage of these students were in the lowest grade point average categories. The grade point average of CR-NC Users proved to be lower by more than the 0.10 hypothesized.

Table 8. Percentage of CR-NC users in grade point average categories, mean grade point average of CR-NC users, class grade point average: Sophomores. (N = 902)\*

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50 above	CR-NC GPA	Sophomore GPA
1968	8.3%	17.7%	20.8%	25.0%	28.1%	2.94	2.48
1969	3.1%	19.2%	20.2%	30.1%	27.5%	3.01	2.43
1970	3.3%	13.9%	22.5%	30.5%	29.8%	3.06	2.50
1971	3.7%	9.1%	25.6%	34.1%	27.4%	3.05	2.50
1972	3.0%	9.1%	21.8%	36.4%	30.0%	3.04	2.64
1973	6.8%	10.5%	27.1%	27.1%	28.6%	2.95	2.68
					GPA TOTALS	3.03	2.54

\*The total number of sophomores who used the option was 915. Thirteen of this total were deleted in Table 8 due to lack of grade point average data.

The sophomore CR-NC User grade point average was consistently higher than the class average for all Fall Terms. The 1973 percentage of sophomores in the lowest grade point average category was highest since the inception of the option in 1968. The highest CR-NC User

grade point average for sophomores was in 1970, the term the lowest percentage of sophomores used the option (Table 5).

Table 9. Percentage of CR-NC users in grade point average categories, mean grade point average of CR-NC users, class grade point average: Juniors. (N = 1848)

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50 above	CR-NC GPA	Junior GPA
1968	1.0%	15.8%	24.8%	36.8%	21.8%	3.01	2.48
1969	1.6%	14.9%	24.4%	32.1%	26.5%	3.03	2.52
1970	1.0%	9.9%	27.2%	34.1%	28.1%	3.10	2.56
1971	2.1%	12.8%	21.1%	37.9%	26.1%	3.05	2.58
1972	2.5%	11.3%	23.1%	33.1%	30.0%	3.06	2.70
1973	4.1%	8.5%	26.2%	25.9%	25.0%	3.03	2.72
GPA TOTALS						3.06	2.59

Table 10. Percentage of CR-NC users in grade point average categories, mean grade point average of CR-NC users, class grade point average: Seniors. (N = 2759)

Fall Term	0.00-1.99	2.00-2.49	2.50-2.99	3.00-3.49	3.50 above	CR-NC GPA	Senior GPA
1968	0.5%	13.5%	27.5%	29.0%	29.5%	3.06	2.68
1969	0.8%	16.0%	27.4%	36.0%	19.8%	3.00	2.78
1970	0.3%	12.4%	26.8%	36.5%	24.0%	3.06	2.80
1971	0.2%	8.6%	25.7%	40.0%	25.5%	3.11	2.86
1972	0.8%	8.5%	22.4%	36.9%	31.4%	3.14	2.87
1973	0.2%	6.6%	22.1%	45.8%	25.3%	3.14	2.89
GPA TOTALS						3.09	2.81

The grade point averages for CR-NC Users were invariably higher than the class averages for juniors and seniors. While grade point averages for both classes have risen consistently for the six terms studied, CR-NC grade point averages are amazingly consistent over the six terms. Students at the upper levels of their academic careers who use the grading option appear to be in the upper levels of academic achievement. Over twenty percent of sophomores, juniors and seniors who use the option was in the 3.50 or above grade category (with one exception, seniors in 1969, Table 10.) The decreasing number of students at the lowest grade point level was understandable because of the 2.00 cut off level required for graduation. Less than twenty percent of the CR-NC Users, sophomores through seniors was in the 2.00-2.49 category.

The results of this examination indicate that the students at the higher grade point levels choose to take courses using the CR-NC option. These results display a similarity to the use of the pass-fail option at the University of California at Berkeley where the option was used by students with above academic abilities who use the option to avoid average or lower grades.<sup>1</sup> Except for the freshmen CR-NC Users, grade point averages were higher for CR-NC Users as compared to Class averages. The results of this examination do not support the hypothesis that grade point averages among CR-NC Users were at least 0.10 lower than the grade point average of each respective class average except for freshmen.

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<sup>1</sup>Sidney Suslow, op. cit., p. 7.

Hypothesis 4

Undergraduates who have used the Credit-No Credit Option will not have chosen to take courses on this basis that are in a different "College" than the one of their designated major.

Tables 11 through 20 display numbers and types of students according to declared majors in ten selected classes. The students considered in the tables were a total number of students who had taken the respective class on a CR-NC basis in the six Fall Terms studied. Majors were grouped according to student's college. Percentages were compiled with reference to the percent of the total number of students who took the class on a CR-NC basis within each College. Percentage of "Outside College" students was calculated for each class and compared to the Within College percentage. Tables 11a through 20a present these comparisons.

A brief course description\* was stated prior to each table.

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\*"Description of Courses List," Michigan State University, Volume 68, No. 3, November, 1973.



Table 11. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	Introductory Physics	(N = 39)
College:	Natural Science	
Course Description:	Mechanics and Heat	
<hr/>		
<u>Declared Major</u>		<u>Number of Students</u>
Audiology and Speech Sciences . . . . .		14
Psychology . . . . .		7
Agriculture and Natural Resources . . . . .		6
Biological Sciences . . . . .		2
History		
Human Ecology		
Sociology		
Physical Sciences		
Advertising . . . . .		1
Biology		(in each major)
Anthropology		
Justin Morrill College		
Preprofessional		
University College		

Table 11a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
Introductory Physics	10.2%	89.8%

Table 12. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

<u>Declared Major</u>	<u>Number of Students</u>
Course Title: Introduction to Economics (N = 183)	
College: Business	
Course Description: Problems of unemployment; meaning and determination of national income; the multiplier; the accelerator; fiscal policy; deficit spending; monetary policy; banks creation of money; international aspects of employment problems.	
Advertising . . . . .	26
University College . . . . .	17
Human Ecology . . . . .	14
Physical Sciences . . . . .	9
Agriculture and Natural Resources . . . . .	9
Mathematics and Statistics . . . . .	9
Social Science . . . . .	8
Psychology . . . . .	7
Television and Radio . . . . .	7
Mechanical Engineering . . . . .	7
Biological Sciences . . . . .	6
Social Work . . . . .	5
Political Science . . . . .	4
History . . . . .	4
Communication . . . . .	4
Justin Morrill College . . . . .	4
Journalism . . . . .	3
Elementary and Special Education . . . . .	3
Engineering Sciences . . . . .	3
Art . . . . .	3
Nursing . . . . .	2
Sociology . . . . .	2
English . . . . .	2

Table 12. Continued.

<u>Declared Major</u>	<u>Number of Students</u>
Civil Engineering . . . . .	2
Justice, Morality and Constitutional Democracy . .	2
Biology . . . . .	2
Criminal Justice . . . . .	2
Urban Planning and Landscape Architecture . . . . .	2
Business Law and Financial Administration	
Hotel, Restaurant and Institutional Management	
Music	
Accounting and Financial Administration	
Communication Arts, Mass Media	
Health, Physical Education and Recreation	
Metallurgy	
Chemical Engineering	
Romance Languages . . . . .	1
Anthropology	(in each major)
Mathematics	
Ethnic and Religious Intergroup Relations Policy Problems	
Audiology and Speech Sciences	
Arts and Letters	
Preprofessional	

Table 12a. Percentage of students taking course within and outside college of declared major.

<u>Course Title</u>	<u>Percentage of Within Major Students</u>	<u>Percentage of Outside Major Students</u>
Introduction to Economics	1.6%	98.4%

Table 13. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	History of Western Art (N = 48)
College:	Arts and Letters
Course Description:	Painting, sculpture, architecture from the time of the Greeks to the present. Individual works of art examined intensively, as regards both their formal qualities and the manner in which they exemplify the shifting patterns of Western culture.
<u>Declared Major</u>	<u>Number of Students</u>
Psychology . . . . .	9
Human Ecology . . . . .	7
English . . . . .	6
Television and Radio . . . . .	3
Elementary and Special Education . . . . .	2
Physical Sciences . . . . .	2
Romance Languages . . . . .	2
Health, Physical Education and Recreation . . . . .	2
Arts and Letters . . . . .	2
Theatre . . . . .	2
Political Science	
Economics	
History	
Journalism	
Hotel, Restaurant and Institutional Management	
Anthropology . . . . .	1
Biochemistry	(in each major)
Criminal Justice	
Engineering Sciences	
Computer Science	
University College	

Table 13a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
History of Western Art	27.1%	72.9%

Table 14. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

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Course Title:	Psychology of Personality (N = 51)
College:	Social Science
Course Description:	Application of psychological principles to an introductory understanding of personality and interpersonal adjustments; social motivation, frustration, conflicts and adjustment mechanisms; theories of adjustment, the assessment of personality problems, mental hygiene and some theories of psychotherapy.

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<u>Declared Major</u>	<u>Number of Students</u>
Human Ecology . . . . .	5
Mathematics and Statistics . . . . .	4
Television and Radio . . . . .	4
Physical Sciences . . . . .	3
Biological Sciences . . . . .	3
Criminal Justice . . . . .	3
Business Law and Financial Administration . . . . .	2
Social Science . . . . .	2
Music . . . . .	2
Chemical Engineering . . . . .	2
Art . . . . .	2
Mechanical Engineering . . . . .	2
University College . . . . .	2
Lymān Briggs College	
Preprofessional	
Socioeconomic Regulatory and Welfare Policy Problems	
Audiology and Speech Sciences	
Ethnic and Religious Intergroup Relations Policy Problems	
Engineering Sciences	
Mathematics	
Biochemistry . . . . .	1
Justin Morrill	(in each major)
Justice, Morality and Constitutional Democracy	

Table 14. Continued.

<u>Declared Major</u>	<u>Number of Students</u>
Human Medicine	1
Civil Engineering	(in each major)
Economics	. . . . .
Political Science	
Agriculture and Natural Resources	

Table 14a. Percentage of students taking course within and outside college of declared major.

<u>Course Title</u>	<u>Percentage of Within Major Students</u>	<u>Percentage of Outside Major Students</u>
Psychology of Personality	11.7%	88.3%

Table 15. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	Individual Sports (N = 86)
College:	Education
Course Description:	Provides opportunities for the student to become adept in one or more activities with high carry-over value, and acquire skills which will be a source of healthful recreational exercise.
<u>Declared Major</u>	<u>Number of Students</u>
Elementary and Special Education . . . . .	7
Justin Morrill College . . . . .	7
Human Ecology . . . . .	6
Social Science . . . . .	5
Agriculture and Natural Resources . . . . .	4
Mathematics and Statistics . . . . .	4
Accounting and Financial Administration . . . . .	3
Arts and Letters . . . . .	3
Political Science	
Business Law and Financial Administration	
Journalism	
Hotel, Restaurant and Institutional Management	
Biological Sciences	
Romance Languages	
Justice, Morality and Constitutional Democracy	
Biology . . . . .	2
Mathematics . . . . .	(in each major)
Preprofessional	
Lyman Briggs College	
Psychology	
Nursing	
Sociology	
Electrical Engineering	
English	
Music . . . . .	1
Marketing and Transportation Administration . . . . .	(in each major)
Advertising	



Table 15. Continued.

<u>Declared Major</u>	<u>Number of Students</u>
Health, Physical Education and Recreation	
Metallurgy	
Chemical Engineering	
Criminal Justice	1
Engineering Sciences . . . . .	(in each major)
German and Russian	
Urban Planning and Landscape Architecture	
James Madison College	
Medical Technology	

Table 15a. Percentage of students taking course within and outside college of declared major.

<u>Course Title</u>	<u>Percentage of Within Major Students</u>	<u>Percentage of Outside Major Students</u>
Individual Sports	9.3%	90.7%

Table 16. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	Survey of Accounting Concepts (N = 44)
College:	Business
Course Description:	Non-technical approach to accounting concepts underlying income determination and asset valuation. Preparation and interpretation of financial statements, the evaluation of costs and performance, and accounting controls of business are among the topics covered.
<u>Declared Major</u>	<u>Number of Students</u>
Criminal Justice . . . . .	7
Advertising . . . . .	5
Human Ecology . . . . .	5
Social Science . . . . .	5
Economics . . . . .	5
Civil Engineering . . . . .	3
Agricultural and Natural Resources . . . . .	2
History . . . . .	2
Physical Sciences . . . . .	2
Political Science	
Psychology	
Journalism	
Television and Radi . . . . .	1
Health, Physical Education and Recreation	(in each major)
Engineering Sciences	
Mechanical Engineering	

Table 16a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
Survey of Accounting Concepts	11.3%	88.7%

Table 17. Declared majors of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	General Anatomy (N = 40)
College:	Human Medicine
Course Description:	Designed to impart the basic concepts of the broad field of anatomy. Special requirements of the various disciplines will be met in their respective laboratories.
<u>Declared Major</u>	<u>Number of Students</u>
Audiology and Speech Sciences . . . . .	9
Psychology . . . . .	8
Social Work . . . . .	7
University College . . . . .	3
Art . . . . .	2
English . . . . .	2
Agricultural and Natural Resources	
Economics	
Mathematics and Statistics	
Human Ecology	
Physical Sciences . . . . .	1
Communications	(in each major)
Biological Sciences	
Biochemistry	
Ethnic and Religious Intergroup Relations Policy Problems	

Table 17a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
General Anatomy	0.0%	100.0%

Table 18. Declared major of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	College Algebra and Trigonometry	(N = 67)
College:	Natural Science	
Course Description:	Number systems; variables; functions and relations; mathematical induction; exponents and radicals; elementary theory of equations; binomial theorem, determinants, matrices and systems equations.	
<u>Declared Major</u>	<u>Number of Students</u>	
Psychology . . . . .	12	
Sociology . . . . .	10	
University College . . . . .	7	
Political Science . . . . .	6	
Audiology and Speech Sciences . . . . .	6	
Agricultural and Natural Resources . . . . .	4	
Elementary and Special Education . . . . .	3	
Preprofessional . . . . .	2	
Art . . . . .	2	
History		
Human Ecology		
Accounting and Financial Administration		
Biological Sciences		
Romance Languages		
Justice, Morality and Constitutional Democracy		
Health, Physical Education and Recreation . . . . .	1	
Arts and Letters	(in each major)	
Urban Planning and Landscape Architecture		
Philosophy		
College of Natural Science		

Table 18a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
College Algebra and Trigonometry	2.9%	97.1%

Table 19. Declared major of undergraduates taking course on a CR-NC basis in six fall terms.

Course Title:	Elementary Russian (17)
College:	Arts and Letters
Course Description:	Fundamentals of grammar, syntax, pronunciation with graded readings.
Declared Major	Number of Students
Physical Sciences . . . . .	4
Political Science . . . . .	2
Mathematics and Statistics . . . . .	2
Biological Sciences . . . . .	2
Biochemistry . . . . .	2
Engineering Sciences . . . . .	2
Lyman Briggs College . . . . .	2
University College	
Preprofessional	
Urban Planning and Landscape Architecture	
Physical Science	
Geography . . . . .	1
Electrical Engineering	(in each major)
Human Ecology	
History	
Psychology	

Table 19a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
Elementary Russian	4.0%	96.0%

Table 20. Declared major of undergraduates taking course on a CR-NC basis in six fall terms.

<u>Declared Major</u>	<u>Number of Students</u>
English . . . . .	20
Mathematics and Statistics . . . . .	8
History . . . . .	7
Philosophy . . . . .	6
University College . . . . .	4
Social Science . . . . .	4
Psychology . . . . .	4
Justin Morrill College . . . . .	3
Accounting and Financial Administration . . . . .	2
Biology . . . . .	2
Anthropology . . . . .	2
James Madison College . . . . .	2
Lyman Briggs College	
Arts and Letters	
Ethnic and Religious Intergroup Relations Policy Problems	
Engineering Sciences	
Criminal Justice . . . . .	1
Mathematics	(in each major)
Biological Sciences	
Physical Sciences	
Human Ecology	
Nursing	
Business Law and Financial Administration	
Economics	
Political Science	

Table 20a. Percentage of students taking course within and outside college of declared major.

Course Title	Percentage of Within Major Students	Percentage of Outside Major Students
Second Year French	42.8%	57.1%

It appears that undergraduates elect to take courses on the CR-NC basis outside the College of their declared majors. There may be individual circumstances where students have to take courses required by their individual programs that are outside the College of their major areas. In many cases, these courses can be taken on a CR-NC basis.

For the Introductory Physics course (Tables 11, 11a) the largest number of majors using the option was Audiology and Speech sciences. This course is an outside college requirement for fulfillment of the degree.<sup>1</sup> Although the course is outside the Communication Arts College, use of the option for the fulfillment of a requirement cannot be considered "exploration."

Majors in the Department of Advertising were the most predominant in use of the option in the Introduction to Economics course. This course was also an outside college requirement.<sup>2</sup>

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<sup>1</sup>"Academic Programs Section," Michigan State University Catalog, Michigan State University Publication, Vol. 67, No. 10, June, 1973, p. 137.

<sup>2</sup>Ibid., p. 136.

In the History of Western Art, Psychology of Personality, Individual Sports, Survey of Accounting Concepts, and College Algebra and Trigonometry courses, the largest number<sup>1</sup> of majors in each course that took the class on a CR-NC basis did not have the course as a requirement.

The General Anatomy course was taken using the option by Audiology and Speech Sciences majors most often. This course was an outside college requirement for the major.

For the Elementary Russian and Second Year French courses the largest number of majors in each course had the option of fulfilling a language requirement for the major.<sup>1</sup>

The use of the CR-NC option by undergraduates must be examined in the context of the individual student's academic program. Classification by courses taken on this basis according to "Within Major" and "Outside Major" colleges may not give a full indication of whether courses were taken for exploration purposes.

## Part II

### Questionnaire Percent Frequency Counts

Two questionnaires were used to sample student opinion concerning the areas: use of the Credit-No Credit Grading option and grading practices. A total of 454 questionnaires were sent to users of the CR-NC option and a total of 401 were sent to a random sample of students who had not used the CR-NC option.\* For the CR-NC sample

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<sup>1</sup>Ibid., pp. 91, 212.

\*Student comments on both questionnaires are presented in Appendix F.



346 were returned, for the random sample, 281, for response rates of 77 percent and 72 percent, respectively. Table 21 is a presentation of the percent-frequency tabulation of the CR-NC survey.

Table 21. Questionnaire response percent-frequency count for a stratified sample of undergraduates who chose to use the Credit-No Credit grading option.

<u>ITEM</u>	<u>NR</u>	<u>SA</u>	<u>A</u>	<u>D</u>	<u>SD</u>	<u>DK</u>
Grades tend to stimulate me to study.	2.02	15.32	45.66	24.57	11.27	1.16
I felt more at ease in the CR-NC course than in other courses.	1.45	44.51	40.46	11.56	1.73	.29
Students learn more in courses graded on a CR-NC basis than in comparable courses with regular grades.	8.38	8.38	25.14	47.69	6.94	3.47
I plan to take more courses on a CR-NC basis.	7.23	29.19	44.51	13.01	5.20	.87
If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	2.60	39.60	33.24	21.97	2.37	.29
A student should be able to take as many courses as he wishes using the CR-NC option.	1.45	30.35	32.37	27.46	8.38	0.00

Key: NR - No Response

SA - Strongly Agree With Statement

A - Agree With Statement

D - Disagree With Statement

(N = 346)

SD - Strongly Disagree With Statement

DK - Don't Know

Table 21. Continued.

ITEM	NR	SA	A	D	SD	DK
The CR-NC option gives students an opportunity to take courses outside of his/her major area without fear of lowering the grade point average.	1.45	65.90	31.50	.87	.29	0.00
I am generally satisfied with the present grading system at M.S.U.	1.45	5.78	46.82	29.48	16.18	.29
Credit (CR) in a CR-NC course should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	.87	14.45	21.10	41.91	21.68	0.00
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	2.02	23.70	26.59	36.71	10.40	.58
Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.	16.18	4.62	33.53	25.72	3.76	16.18
I plan to attend a graduate or professional school after I graduate.	2.89	32.66	36.99	20.81	3.18	3.47
I would have studied harder the in CR-NC course I took during Winter Term 1974, had I been graded on a regular basis.	2.02	6.94	25.14	41.62	23.99	.29
Taking the CR-NC option allowed me more time to study harder for my other courses.	1.73	27.17	43.06	22.25	4.91	.87

Table 21. Continued.

ITEM	NR	SA	A	D	SD	DK
I would not have taken the course that I took on a CR-NC basis during Winter Term, 1974, if the grading option were not available.	1.73	27.17	43.06	22.25	4.91	.87
I was satisfied with my decision to take a course on a CR-NC basis.	1.73	48.55	37.86	7.51	4.05	.29
The CR-NC option should be publicized more.	1.45	41.04	46.53	9.25	1.16	.58

Table 22 is a presentation of the percent-frequency tabulation of the random sample of CR-NC Non-Users.

Table 22. Questionnaire response percent-frequency count for a random sample of undergraduates who did not chose to use the Credit-No Credit option. (N = 281)

ITEM	NR	SA	A	D	SD	DK
Grades tend to stimulate me to study harder.	.71	24.20	51.60	18.86	4.27	.36
I am familiar with the requirements of graduate schools.	.36	12.81	38.79	39.50	8.54	0.00
I plan to attend a graduate or professional school after I graduate.	2.49	21.00	36.65	29.89	6.41	3.56
I am generally satisfied with the present grading system at M.S.U.	2.14	6.76	55.52	24.20	11.03	.36
Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC grading option.	9.61	4.98	43.42	27.76	3.20	11.03
If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	1.07	23.13	41.28	25.62	7.12	1.78
A student should be able to take as many courses as he wishes using the CR-NC option.	.36	18.15	46.26	26.69	8.54	0.00

Table 22. Continued.

ITEM	NR	SA	A	D	SD	DK
CR in a CR-NC course should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	.36	6.05	23.13	39.15	30.96	.36
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	0.00	16.73	33.10	31.32	18.86	0.00
I plan to take a course on a CR-NC basis in the future.	5.34	13.52	36.65	31.32	7.83	5.34

The null form of hypotheses 5a through 5h was:

Hypothesis 5

There are no significant differences between Users and Non-Users of the Credit-No Credit Option as measured by the eight common Likert-type questionnaire items.

A Chi-Square Analysis was used to test whether there were significant differences between the two groups. Tables 23 through 30 display the results of this analysis. For each item, the No Response and Don't Know responses were deleted. Percentages in each response category are presented in parenthesis.

Hypothesis 5a

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: Grades tend to stimulate me to study harder.

Table 23. Chi-square analysis results of item 1. (N = 608)

	CR-NC User	Non-User
Strongly Agree	53 (15.9)	67 (24.5)
Agree	157 (47.0)	142 (51.8)
Disagree	85 (25.4)	53 (19.3)
Strongly Disagree	39 (11.7)	12 (4.4)
Total N	334	274
$\chi^2 = 18.32, p < .05$		

Hypothesis 5a was rejected and a significant difference was found between the groups on this item. The Non-Users expressed more agreement with this item than the CR-NC Users. The results indicate that striving for higher grades was more of a predominant trait among Non-Users of the CR-NC option.

#### Hypothesis 5b

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: I plan to attend a graduate or professional school after I graduate.

Table 24. Chi-square analysis results of item 2. (N = 583)

	CR-NC User	Non-User
Strongly Agree	113 (35.0)	59 (22.7)
Agree	127 (39.3)	100 (38.5)
Disagree	72 (22.2)	83 (31.9)
Strongly Disagree	11 (3.4)	18 (6.9)
Total	323	260
$\chi^2 = 16.00, p < .05$		

Hypothesis 5b was rejected and a significant difference was found between the groups on this item. The results show that more CR-NC Users express plans to attend graduate school after graduation.

## Hypothesis 5c

There is no significant difference between CR-NC Users on the questionnaire item: I am generally satisfied with the present grading system at M.S.U.

Table 25. Chi-square analysis results of item 3. (N = 609)

	CR-NC User	Non-User
Strongly Agree	20 (5.9)	19 (7.0)
Agree	162 (47.8)	152 (56.2)
Disagree	101 (29.8)	68 (25.2)
Strongly Disagree	56 (16.5)	31 (11.5)
Total	339	270

$\chi^2 = 6.238$ , not significant

Hypothesis 5c was not rejected. Satisfaction with grading policies was not related to CR-NC use. Both groups may express attitudes toward the present grading system for differing reasons. For both groups, more students express satisfaction with the system than dissatisfaction. CR-NC use does not appear to be a variable involved in expression of this attitude.

## Hypothesis 5d

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.



Table 26. Chi-square analysis results of item 4. (N = 453)

	CR-NC User	Non-User
Strongly Agree	16 (6.9)	14 (6.4)
Agree	115 (49.4)	122 (55.4)
Disagree	89 (38.2)	75 (34.1)
Strongly Disagree	13 (5.6)	9 (4.1)
Total	233	220
$\chi^2 = 1.88$ , not significant		

Hypothesis 5d was not rejected. The large percentages of No Response and Don't Know responses (16.2 percent and 16.2 percent for the CR-NC User, 9.6 percent and 11.0 percent for the Non-User, a combined percentage of 27.1 percent of the Total sample) indicate a lack of knowledge concerning admissions personnel attitudes. This item had the largest percentage of these two non-scalable responses.

#### Hypothesis 5e

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.

Hypothesis 5e was rejected because a significant difference was found between the groups on this item. The familiarity with the CR-NC system among the Users may be a factor in expressing a highly favorable attitude toward taking the University College requirements on this basis. The Non-User group also expressed a favorable attitude

toward taking these requirements on this basis. An inference that could be drawn is that if the required classes were offered on a CR-NC basis, a majority of students would take these classes using the option. Experience with University College courses can be considered a variable involved in expression of this attitude.

Table 27. Chi-square analysis results of item 5. (N = 604)

	CR-NC User	Non-User
Strongly Agree	136 (40.6)	65 (24.2)
Agree	115 (34.3)	115 (42.8)
Disagree	76 (22.7)	70 (26.0)
Strongly Disagree	8 (2.4)	19 (7.1)
Total	335	269
$\chi^2 = 22.88, p < .05$		

#### Hypothesis 5f

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.

Hypothesis 5f was rejected, and a significant difference was found between the groups on this item. The regulations concerning the time limit for a decision on which grading system is used is very specific (Limitations, p. 16). It appears that CR-NC students desire a longer period for decision-making with reference to this issue. A majority of Non-Users also expressed this attitude.

Table 28. Chi-square analysis results of item 6. (N = 616)

	CR-NC User	Non-User
Strongly Agree	105 (30.8)	51 (18.5)
Agree	112 (32.9)	127 (46.0)
Disagree	94 (27.6)	74 (26.8)
Strongly Disagree	29 (8.5)	24 (8.7)
Total	340	276
$\chi^2 = 15.98, p < .05$		

## Hypothesis 5g

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: A student should be able to take as many courses as he wishes using the CR-NC option.

Table 29. Chi-square analysis results of item 7. (N = 617)

	CR-NC User	Non-User
Strongly Agree	50 (14.6)	17 (6.2)
Agree	73 (21.3)	64 (23.2)
Disagree	145 (42.4)	109 (39.6)
Strongly Disagree	74 (21.6)	85 (30.9)
Total	342	275
$\chi^2 = 15.63, p < .05$		

Hypothesis 5g was rejected and a significant difference was found between the groups on this item. The large number of students in both groups expressing a negative attitude toward extending the CR-NC option indicates that a two point grading system is not favored as a universal grading system. Over 70 percent of Non-Users expressed disagreement with this statement.

#### Hypothesis 5h

There is no significant difference between CR-NC Users and Non-Users on the questionnaire item: Credit (CR) in a CR-NC course should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.

Table 30. Chi-square analysis results of item 8. (N = 613)

	CR-NC User	Non-User
Strongly Agree	81 (24.1)	47 (17.0)
Agree	92 (27.4)	91 (32.9)
Disagree	127 (37.8)	87 (31.4)
Strongly Disagree	36 (10.7)	52 (18.8)
Total	336	277

$\chi^2 = 13.24, p < .05$

Hypothesis 5h was rejected and a significant difference was found between the groups on this item. Agreement and disagreement with this statement was nearly evenly divided for both groups, the Non-User group expressing a more favorable attitude toward changing

the minimum to a 1.0. The difference between the groups is one of degree on this item. The student perspective with regard to this issue may be interpreted in two ways: 1) the greater degree of disagreement among Non-Users may be the reason for the unpopularity of the option; and 2) the use of the option by users, who are at the higher grade point average levels (Table 6), may not be due to the minimum requirement of 2.0 or higher.

In order to measure differences among classes and grade point average levels (Hypotheses 6 and 7), the Univariate and Multivariate Analysis of Variance was employed with an alpha level of .05. In order to accommodate questionnaire responses that were in the "No Response" or "Don't Know" categories, the following key was devised:

- KEY: 1 - Strongly Agree  
2 - Agree  
3 - No Response, Don't Know  
4 - Disagree  
5 - Strongly Disagree

Through the use of this key (with the No Response and Don't Know Responses on the scale) means were generated using the total number of returned questionnaires. The schematic design for the initial Multivariate Analysis is Table 31a, for the second, Table 32a. Two separate Multivariate Analyses were used, a four by two way design with eight dependent measures, the independent variables being class, freshmen through senior, and CR-NC User and Non-User and a three by two way design with eight dependent measures, the independent variables

being grade point average categories and CR-NC User and Non-User. For each of the eight dependent measures it was hypothesized that there were no significant differences among classes and grade point level. The Scheffe' Post-Hoc procedure was used to determine which combination of means contributed to the significance of the Univariate F tests, where significance was found.

Table 31. Multivariate Analysis I - MANOVA on a four by two way design on eight variables.

F-Ratio for Multivariate Test of Equality of Mean Vectors = 3.0977			
Degrees of Freedom: 24, 1761.0859			
P Less Than .0001			
Variable	Hypothesis Mean Square	Univariate F	P Less Than
1. Grades tend to stimulate me to study harder.	9.5093	6.3342	.0004*
2. I plan to attend a graduate or professional school after I graduate.	9.8939	6.5877	.0003*
3. I am generally satisfied with the present grading system at M.S.U.	2.8835	1.8371	.1392
4. Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.	6.1288	6.5483	.0003*
5. If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	1.8736	1.1974	.3100

Table 31. Continued.

Variable	Hypothesis Mean Square	Univariate F	P Less Than
6. Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	.7765	.4278	.7332
7. A student should be able to take as many courses as he wishes using the CR-NC option.	1.2340	.6764	.5668
8. Credit (CR) in a CR-NC class should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	1.7646	.8708	.4559

\*Significant at .05 level (the alpha level was divided by 8 for each of the items; the alpha level for each item was .00625).

NOTE: Degrees of Freedom for Hypothesis: 3  
Degrees of Freedom for Error: 614

Table 31a. Design and means for Multivariate Analysis I.

ITEM	CR-NC Users				Non-Users			
	Fresh- men	Sopho- more	Junior	Senior	Fresh- men	Sopho- more	Junior	Senior
Grades tend to stimulate me to study.	2.29	2.90	2.65	2.92	2.05	2.45	2.31	2.28
I plan to attend a graduate or professional school after I graduate.	2.63	2.20	2.27	1.99	2.73	3.00	2.57	2.58
I am generally satisfied with the present grading system at M.S.U.	2.92	3.21	3.05	2.96	2.72	2.95	2.90	3.11
Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.	2.70	2.73	3.06	3.03	2.59	2.71	2.81	2.61
If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	2.16	2.12	2.09	2.19	2.63	2.53	2.24	2.53



Table 31a. Continued.

ITEM	CR-NC Users				Non-Users			
	Fresh- men	Sopho- more	Junior	Senior	Fresh- men	Sopho- more	Junior	Senior
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	2.55	2.51	2.51	2.48	2.72	2.47	2.72	2.53
A student should be able to take as many courses as he wishes using the CR-NC option.	3.29	3.64	3.18	3.33	3.60	3.48	3.66	3.88
Credit (CR) in a CR-NC class should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	2.92	2.87	2.69	2.90	2.99	2.91	2.94	3.26
N for each group	73	75	95	102	78	66	67	66

The following is a brief discussion of items in which significant differences were found:

For item 1, "Grades tend to stimulate me to study harder," Freshmen Non-Users displayed the greatest degree of agreement. This result tends to support the contention that students, when they begin their academic careers at the University, are motivated to study to attain high grades.

For item 2, "I plan to attend a graduate or professional school after I graduate," Senior CR-NC Users expressed the greatest amount of agreement with this item. Considering that this group has attained a relatively high grade point average, planning for attendance in graduate school is not surprising.

For item 4, "Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option," the highest levels of disagreement were for the Junior and Senior CR-NC Users. The Seniors expressed, in the previous significant item, the greatest desire to attend graduate school, and in this item express disagreement with the conditions of graduate school requirements. The higher level students who use the option may not realize the ramifications of taking a few courses on this basis.

Although there were no significant differences in item 7, the consistent disagreement among all groups on this item indicates that all students, regardless of class, do not favor an extension of the CR-NC option to include as many courses as the student wishes. Senior CR-NC Non-Users express the greatest degree of disagreement with this item.

Table 31b. Multivariate Analysis I: CR-NC user by non-user.

Variable	Hypothesis Mean Sq.	Univariate F	P Less Than
1	24.5142	16.3290	.0001*
2	19.3579	12.8892	.0004*
3	9.6006	6.1167	.0137*
4	.9905	1.0583	.3041
5	19.1502	12.2383	.0006*
6	1.5603	.8597	.3542
7	14.5507	7.9758	.0049*
8	5.1532	2.5431	.1113

\*Significant at .05 level.

Table 31c. Multivariate Analysis I: Interaction.

Variable	Hypothesis Mean Sq.	Univariate F	P Less Than
1	.8167	.5440	.6524
2	2.9191	1.9436	.1214
3	.3890	.2478	.8630
4	.7501	.8015	.4934
5	.8077	.5162	.6713
6	3.6413	1.9959	.1134
7	.8427	.4159	.7417

Table 31d. Multivariate Analysis I: Error term for analysis of variance.

Variable	Error Term
1	1.50
2	1.50
3	1.56
4	.93
5	1.56
6	1.81
7	1.82
8	2.03

#### Hypothesis 6

There are no significant differences among Freshmen, Sophomores, Juniors and Seniors as measured by the eight common Likert-type questionnaire items.

Significant differences by class were found for three of the eight items, and the null hypothesis is rejected for Items 1, 2, and 4. Interaction was not significant (Table 31c) for the groups. If there is no interaction there is considerable economy in the description of the results, since only the main effect need be thought about instead of the effects corresponding to all treatment combination.<sup>1</sup> To locate differences where the significant F ratios were found, Scheffe' Post Hoc Contrasts were employed. (Tables 31e, 31f, 31g.)

<sup>1</sup>D. R. Cox, Planning of Experiments (New York: John Wiley & Sons, 1958), p. 102.

Table 31e. Post-Hoc contrasts for Multivariate Analysis I: Item 1.  
(Grades tend to stimulate me to study harder.)

Groups Compared	Mean	Difference	Confidence Interval
Freshmen vs. Sophomore	2.16 2.69	.53*	±.39
Freshmen vs. Junior	2.16 2.51	.35	±.37
Freshmen vs. Senior	2.16 2.67	.51*	±.37
Sophomore vs. Junior	2.69 2.51	.18	±.39
Sophomore vs. Senior	2.69 2.67	.02	±.39
Junior vs. Senior	2.51 2.67	.16	±.37

\*Significant at .05 level.

The Post-Hoc contrasts for item 1 were significant for the comparisons between Freshmen and Sophomores, and Freshmen and Seniors. Freshmen express consistently more agreement with the item. The third highest degree of difference between the groups was between Freshmen and Juniors. All groups display agreement with this item so the differences are a matter of degree. Student responses display that there is basic agreement with the use of grades at the undergraduate level.

In the second item, a significant difference was found between Freshmen and Seniors. The results display that student progression in college is directly related to desire for graduate school. Upperclassmen express a greater desire to attend than Freshmen in all

cases, with Sophomores greater than Freshmen, Juniors greater than Sophomores and Seniors greater than Juniors.

Table 31f. Post-Hoc contrasts for Multivariate Analysis I: Item 2. (I plan to attend a graduate or professional school after I graduate.)

Groups Compared	Mean	Difference	Confidence Interval
Freshmen vs. Sophomore	2.68 2.57	.11	±.39
Freshmen vs. Junior	2.68 2.39	.29	±.37
Freshmen vs. Senior	2.68 2.22	.46*	±.37
Sophomore vs. Junior	2.57 2.39	.18	±.39
Sophomore vs. Senior	2.57 2.22	.35	±.39
Junior vs. Senior	2.39 2.22	.17	±.37

\*Significant at .05 level.

In the fourth item, a significant difference was found between Freshmen and Juniors. The results indicate that Juniors and Seniors express the least amount of agreement with this item. This may mean that upper college students tend to be less concerned with possible ramifications of taking CR-NC courses and therefore choose to take classes on this basis.

Table 31g. Post-Hoc contrasts for Multivariate Analysis I: Item 4.  
 (Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.)

Groups Compared	Mean	Difference	Confidence Interval
Freshmen vs. Sophomore	2.64 2.72	.08	.31
Freshmen vs. Junior	2.64 2.96	.32*	.29
Freshmen vs. Senior	2.64 2.87	.23	.29
Sophomore vs. Junior	2.72 2.96	.24	.31
Sophomore vs. Senior	2.72 2.87	.15	.31
Junior vs. Senior	2.96 2.87	.09	.29

\*Significant at .05 level.

Table 32. Multivariate Analysis II - MANOVA on a three by two way design on eight variables.

F-Ratio for Multivariate Test of Equality of Mean Vectors = 5.7499			
Degrees of Freedom: 16, 1218.0			
P Less Than .0001			
Variable	Hypothesis Mean Square	Univariate F	P Less Than
1. Grades tend to stimulate me to study harder.	2.6011	1.7095	.1819
2. I plan to attend a graduate or professional school after I graduate.	25.8515	17.5795	.0001*
3. I am generally satisfied with the present grading system at M.S.U.	12.7784	8.3337	.0003*
4. Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.	2.4695	2.5790	.0767
5. If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	5.0693	3.2936	.0378
6. Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	5.3933	3.0394	.0486



Table 32. Continued.

Variable	Hypothesis Mean Square	Univariate F	P Less Than
7. A student should be able to take as many courses as he wishes using the CR-NC option.	30.9190	17.9047	.0001*
8. Credit (CR) in a CR-NC class should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	9.2823	4.6485	.0100

\*Significant at .05 level.

NOTES: Degrees of Freedom for Hypothesis: 2  
Degrees of Freedom for Error: 616

Table 32a. Design and means for Multivariate Analysis II.

ITEM	CR-NC Users			Non-Users		
	0.00-1.99	2.00-2.99	3.00 above	0.00-1.99	2.00-2.99	3.00 above
Grades tend to stimulate me to study harder.	2.82	2.64	2.75	3.20	2.33	2.17
I plan to attend a graduate or professional school after I graduate.	2.36	2.53	2.06	1.90	2.99	2.35
I am generally satisfied with the present grading system at M.S.U.	3.18	3.30	2.84	3.00	2.98	2.57
Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.	2.73	2.81	2.98	2.70	2.72	2.87
If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	1.64	2.08	2.22	2.70	2.26	2.74

Table 32a. Continued.

ITEM	CR-NC Users			Non-Users		
	0.00-1.99	2.00-2.99	3.00 above	0.00-1.99	2.00-2.99	3.00 above
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	1.73	2.45	2.59	3.20	2.37	2.81
A student should be able to take as many courses as he wishes using the CR-NC option.	2.73	3.07	3.57	2.60	3.33	4.06
Credit (CR) in a CR-NC class should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	2.55	2.69	2.96	2.30	2.86	3.24
N for each group	11	135	199	10	134	133

The following is a brief discussion of items in which significant differences were found.

For item 2, "I plan to attend a graduate or professional school after I graduate," the lowest grade point average category of Non-Users expressed the greatest agreement with this item. The small number of respondents in this category (N = 10) made it difficult to draw generalizations from this result. Students in the highest grade point average who used the option expressed the second highest degree of agreement with this item, followed by the highest grade point average category of Non-Users. The results indicate a consistency among students in the higher grade point average categories with reference to plans to attend graduate school.

For item 3, "I am generally satisfied with the present grading system at M.S.U.," the highest grade point average categories expressed the greatest agreement with this item. The most disagreement was among middle category CR-NC Users.

For item 7, "A student should be able to take as many courses as he wishes using the CR-NC option," highest grade point average CR-NC Non-Users expressed the greatest amount of disagreement. The only category to express agreement with this item was the lowest grade point average classification. The mean for the high grade point average Non-Users was the highest for any of the items, indicating that this group strongly disagrees with the extension of the CR-NC option.

Table 32b. Multivariate Analysis II: CR-NC user by non-user.

Variable	Hypothesis Mean Sq.	Univariate F	P Less Than
1	28.3265	18.6164	.0001*
2	17.9117	12.1803	.0006*
3	12.8518	8.3815	.0040*
4	1.4290	1.4924	.2224
5	23.0037	14.9459	.0002*
6	2.7034	1.5235	.2176
7	20.3692	11.7955	.0007*
8	6.9338	3.4724	.0629

\*Significant at .05 level.

Table 32c. Multivariate Analysis II: Interaction.

Variable	Hypothesis Mean Sq.	Univariate F	P Less Than
1	3.2204	2.1165	.1214
2	2.2381	1.5219	.2192
3	.0941	.0614	.9405
4	.0287	.0300	.9705
5	3.3568	2.1810	.1139
6	6.5388	3.6849	.0257
7	1.6929	.9803	.3758
8	.7979	.3996	.6708

Table 32d. Multivariate Analysis II: Error term for analysis of variance.

Variable	Error Term
1	1.52
2	1.47
3	1.53
4	.96
5	1.54
6	1.77
7	1.73
8	1.99

### Hypothesis 7

There are no significant differences among low, middle and high grade point average categories as measured by eight common Likert-type questionnaire items.

Significant differences were found for three of the eight items, and the null hypothesis is rejected for items 2, 3, and 7. Interaction was not significant (Table 32c) for the groups. To locate differences where the significant F ratios were found, Scheffe' Post-Hoc Contrasts were employed. (Tables 32e, 32f, 32g.)

The Post-Hoc contrast for item 2 was significant for the comparison between the middle and highest categories. The results indicate that there is a direct relation between grade point average and plans to attend graduate school. The degree of agreement with this item among respondents in the lowest category may indicate unwarranted high aspirations.

Table 32e. Post-Hoc contrasts for Multivariate Analysis II: Item 2.  
(I plan to attend a graduate or professional school after  
I graduate.)

Groups Compared	Mean	Difference	Confidence Interval
0.00-1.99 vs. 2.00-2.99	2.14 2.76	.62	±.67
0.00-1.99 vs. 3.00 above	2.14 2.17	.03	±.67
2.00-2.99 vs. 3.00 above	2.76 2.17	.59*	±.24

\*Significant at .05 level.

The significant contrast for item 3 was the comparison between the middle and highest categories. When respondents were classified according to grade point average levels, only the highest category respondents expressed a favorable attitude toward the grading system. The results show that there is a direct relation between grade point average and satisfaction with grading policies.

The Post-Hoc contrasts for item 7 were significant for the comparisons between the middle and highest categories, and between the lowest and highest categories--the actual difference being larger in the latter comparison. The small number of students in the low grade point average categories resulted in a greater confidence interval for this contrast. The least amount of agreement on this item was among the high grade point average respondents. The results indicate that there is a direct relation between rise in grade point average and degree of

disagreement with extending the CR-NC option. Although the largest number of users are at the highest grade point averages (Table 5), this group does not agree with extending the use of the option.

Table 32f. Post-Hoc contrasts for Multivariate Analysis II: Item 3. (I am generally satisfied with the present grading policy at M.S.U.)

Groups Compared	Mean	Difference	Confidence Interval
0.00-1.99 vs. 2.00-2.99	3.09 3.14	.05	±.69
0.00-1.99 vs. 3.00 above	3.09 2.73	.36	±.68
2.00-2.99 vs. 3.00 above	3.14 2.73	.41*	±.26

\*Significant at .05 level.

Table 32g. Post-Hoc contrasts for Multivariate Analysis II: Item 7. (A student should be able to take as many courses as he wishes using the CR-NC option.)

Groups Compared	Mean	Difference	Confidence Interval
0.00-1.99 vs. 2.00-2.99	2.67 3.20	.53	±.73
0.00-1.99 vs. 3.00 above	2.67 3.76	1.09*	±.72
2.00-2.99 vs. 3.00 above	3.20 3.76	.56*	±.28

\*Significant at .05 level.



## MANOVA I Results: Summary

Significant differences were found in items 1, 2, and 4. Post-Hoc contrasts were used by item to locate differences, with the following results:

Item 1 - Grades tend to stimulate me to study harder.

Significant Contrasts: Freshmen vs. Sophomore  
Freshmen vs. Senior

Item 2 - I plan to attend a graduate or professional school after I graduate.

Significant Contrast: Freshmen vs. Senior

Item 4 - Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.

Significant Contrast: Freshmen vs. Junior

## MANOVA II Results: Summary

Significant differences were found in items 2, 3, and 7. Post-Hoc contrasts were used to locate differences, with the following results:

Item 2 - I plan to attend a graduate or professional school after I graduate.

Significant Contrast: 2.00-2.99 vs. 3.00 above

Item 3 - I am generally satisfied with the present grading policy at M.S.U.

Significant Contrast: 2.00-2.99 vs. 3.00 above

Item 7 - A student should be able to take as many courses as he wishes using the CR-NC option.

Significant Contrasts: 0.00-1.99 vs. 3.00 above  
2.00-2.99 vs. 3.00 above

An ancillary facet of the study was the telephone interview administered to teaching faculty members at Michigan State University. The results of the structured interview is presented in Table 33.

Table 33. Percent frequency count of interview responses expressed by teaching faculty.

Item	Percent Yes	Percent No	Percent Don't Know
Do you consider yourself familiar with the CR-NC grading option?	82%	18%	0%
One of the major reasons for offering the CR-NC grading option is to offer to students an opportunity to explore outside their major area. Do you think this is being accomplished?	38%	46%	16%
Do you think that grades stimulate students to study?	92%	6%	2%
Do you think that students should be able to decide at any time during the term whether to receive a grade or credit-no credit?	38%	60%	2%
Do you think that professors should be told which students are taking their classes using the CR-NC option?	30%	70%	0%
	<u>Percent Continued</u>	<u>Percent Changed</u>	<u>Non-committal</u>
Do you think that the present CR-NC grading option should be continued or do you think that it should be changed?	68%	30%	2%

In addition to the previous responses, faculty members expressed comments concerning the CR-NC option and the issue of grading.\*

### Hypothesis 8

Faculty members will express a more favorable attitude than students who have and have not used the Credit-No Credit option on the item measuring whether grades stimulate students to study.

For the CR-NC User and Non-User Samples, percentages of responses in the "Strongly Agree" and "Agree" categories were calculated. This percentage was considered a "favorable" attitude. Table 34 presents the comparative percentages of the three groups.

Table 34. Percentage favorable responses expressed by faculty, CR-NC Users and Non-Users: Item 4.

Item	Faculty	CR-NC Users	Non-Users
<b>Faculty:</b>			
Do you think that grades stimulate students to study?	92%		
<b>Students:</b>			
Grades tend to stimulate me to study harder.		61%	75.8%

Although all three groups express agreement with regard to the issue of grades stimulating students to study, faculty members expressed the greatest amount of agreement with this item. The results of this examination support the hypothesis that faculty members view grades as a stimulation to study more so than students.

\*Faculty comments are presented in Appendix E.

Hypothesis 9

Faculty members will express a less favorable attitude than students who have and have not used the Credit-No Credit option as measured on a scale measuring whether students should be able to decide at any time during the term whether to receive a grade or Credit-No Credit.

For the student samples, favorable responses were calculated through combining the "Strongly Agree" and "Agree" categories. Table 35 expresses the comparative percentages for the three groups.

Table 35. Percentage favorable responses expressed by faculty, CR-NC Users and Non-Users: Item 3.

Item	Faculty	CR-NC Users	Non-Users
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	38%	50.3%	49.8%

As Table 35 indicated, faculty members express a less favorable attitude on this item than both Users and Non-Users. Both Users and Non-Users of the option are relatively similar in expressing attitudes toward extending the decision-making period. Agreement and disagreement with this item was nearly equally divided for the student groups. A majority of faculty members expressed the opinion that the grading system decision be made early in the term.

The results of this comparison support the hypothesis that faculty members will express a less favorable opinion than students concerning extending the time period for grading system decision-making by students.

## CHAPTER V

### DISCUSSION AND RECOMMENDATIONS

Chapter V contains a brief overview of the study, discussion and interpretation of the findings and recommendations with reference to grading policies and suggestions for future research.

#### Overview

The purpose of this study was to investigate the past use of the Credit-No Credit system at Michigan State University, and to survey current students who have and who have not used the Credit-No Credit option. The entire population of CR-NC Users in Fall Term, 1968 to 1972 was related in the descriptive facet of the study. For the survey, CR-NC Users and Non-Users during Winter Term, 1974 were sampled. The two groups were compared on eight common questionnaire items and on the basis of class and grade point average levels. In an ancillary part of the study teaching faculty members at Michigan State were interviewed and responses were compared to the student responses that were similar.

The statistical analysis of the questionnaire was conducted using Chi-Square Analysis, Multivariate Analysis of Variance and Scheffe' Post-Hoc Contrasts. In the analysis an alpha level of .05 was used to determine statistical significance.

### Discussion of Findings

Nine hypotheses were examined and tested. The initial four hypotheses were projections concerning the nature of the population of CR-NC students.

Hypothesis 1.--The first hypothesis was concerned with the number of CR-NC Users in each Fall Term, 1968 to 1973. It was hypothesized that the number of Users would not exceed five percent of the undergraduate population. Results indicated that the percentages of CR-NC Users varied between 1.3 percent to 3.6 percent. This result indicated that the use of the CR-NC option is not widespread and that very few undergraduates actually use the system.

The number of males using the option has shown a marked decrease in 1972 and 1973--the first years that males were not predominant CR-NC Users.

Hypothesis 2.--The second hypothesis was concerned with numbers of students by class that have used the option. It was hypothesized that the highest incidence of use would be by Seniors, followed by Juniors, Sophomores and Freshmen. In each Term studied the hypothesis was supported. The reason for the small numbers of Freshmen using the option can be partly explained by the Freshmen unfamiliarity with the option due to initial enrollment. For the survey sample, however, similar percentages of each class were found. Nearly half the CR-NC Users were Seniors and over 32 percent were Juniors. The CR-NC option is basically an upper college grading alternative. Over

eighty percent of the CR-NC Users in six Fall Terms were Seniors and Juniors.

Hypothesis 3.--Cumulative grade point averages of CR-NC Users were compared to Non-Users in the third hypothesis. It was hypothesized that grade point averages among Non-Users would be higher than Users. This hypothesis was not supported for Sophomores, Juniors and Seniors. The mean grade point average of Freshmen CR-NC Users was lower in four of the six terms studied. In the past three terms (1971-1973) a wide majority (60 to 72 percent) of CR-NC Users fall into the lowest grade point average category. For Freshmen, the mean grade point average for all terms was .73 lower than the class average.

For the Sophomore CR-NC Users, grade point averages were consistently higher than the class averages for all terms. Over 50 percent of the Sophomore Users had grade point averages in the 3.00 and above category. In 1968 and 1973 the mean grade point average was below 3.00 due to the larger percentages in the lowest category.

Junior grade point averages among CR-NC Users was consistently above the 3.00 level, and was higher in all cases than the total class grade point average. Senior CR-NC Users displayed similar levels.

The total grade point average difference between Sophomore CR-NC Users and class average was .49; for Juniors, .47; and for Seniors, .38, with the Users having a higher average. For the Freshmen, the difference was .73, the total class average being higher than the Freshmen CR-NC User grade point average.

The results indicated that the students at the higher grade point average levels choose to take classes using the CR-NC option. This generalization is supported except for Freshmen. The mean grade point average for all CR-NC Users regardless of class was .40 higher than the All-University grade point average. The population of CR-NC Users appears to be more academically oriented than the total undergraduate population.

Hypothesis 4.--This hypothesis dealt with the choice of class taken using the CR-NC option. It was hypothesized that students would not take classes outside the "College" of their declared major. Ten classes were chosen for description and students were classified according to majors in each of the classes. These classes are briefly discussed.

Introductory Physics - This class was primarily taken by Audiology and Speech Sciences majors on a CR-NC basis, an "Outside College" graduation requirement for this major. The percentage of "Outside Major" students was 89.8 percent.

Introduction to Economics - A large number of students with diverse majors took this course on a CR-NC basis. Advertising majors used the option most often. This course is an "Outside College" requirement for this major. The percentage of "Outside Major" students was 98.4 percent.

History of Western Art - Within College majors who took this course on a CR-NC basis was 27.1 percent. Psychology majors were the predominant users of the option in this class.



Psychology of Personality - Wide ranges of majors took this class using the option. The percentage of "Outside Major" students was 88.3 percent.

Individual Sports - This class was taken on the grading basis by a wide diversity of majors. The percentage of "Outside Major" students was 90.7 percent.

Survey of Accounting Methods - Criminal Justice majors were the predominant user of the option in this class. The percentage of "Outside Major" students was 88.9 percent.

General Anatomy - This course is offered by the College of Human Medicine. No Human Medicine majors took this course on the CR-NC basis. Audiology and Speech Sciences were the predominant majors in this class, which is an "Outside College" requirement for this major.

College Algebra and Trigonometry - The class was primarily taken by Psychology and Sociology majors on a CR-NC basis. The percentage of "Outside Major" students was 97.1 percent.

Elementary Russian - Physical Sciences students took this class on the grading basis most often. The percentage of "Outside Major" students was 96.0 percent.

Second Year French - This course had the highest percentage of "Within Major" students: 42.8 percent. The predominant major of Users of the option was English.

It appears that students who use the CR-NC option take courses outside the College of their declared majors. Hypothesis 4

was not supported by the results of categorizing students according to Within and Outside the College of their majors. A supposition of the innovative grading option is that it allows opportunity to students for exploration outside their major area. The results show that in many cases this is being accomplished in the classes described. The use of the option by students in certain declared majors, however, may be to fulfill an "Outside College" requirement. The reason for using the option in such courses may be due to student lack of confidence in a class removed from his major area. The individual reasons for taking classes on the CR-NC basis vary for each individual student. Although the reasons may vary, the results of this study show that students may not use the option in the way supported by the Educational Policies Committee.<sup>1</sup>

Hypothesis 5.--The fifth hypothesis was concerned with the differences between CR-NC Users and Non-Users as measured by responses to eight questionnaire items. The differences between the two groups on each of the items is briefly discussed.

Item 1 - Grades tend to stimulate me to study harder.

The Non-Users of the option expressed significantly more agreement with this statement than Users. It appears that grades serve as more of a stimulus to study for those who do not use the option. A majority of both groups, however, expressed agreement with the statement. The results suggest that grades serve the function of affecting student study.

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<sup>1</sup>"The Revised Grading System at Michigan State University,"  
op. cit., p. 11.

Item 2 - I plan to attend graduate or professional school after I graduate.

Users of the CR-NC option expressed significantly more agreement than Non-Users on this item. The nature of the CR-NC population, as presented in the descriptive part of this study, may be a factor in this response. Students who use the CR-NC option were at higher grade point levels than the undergraduate population. The majority of both groups expressed agreement with this statement.

Item 3 - I am generally satisfied with the present grading system at M.S.U.

There was no significant difference between the groups on this item. Majorities of both groups expressed agreement with this item, indicating that students are generally satisfied with the grading policies.

Item 4 - Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.

There was no significant difference between the groups on this item. Thirty-two percent of the CR-NC User respondents expressed a "Don't Know" response or did not respond to the item; over 20 percent of the Non-User sample expressed these responses. This indicates that students are largely unaware of admissions officers' attitudes toward students who use the grading option. Majorities of those responding to the item expressed agreement with the statement.

Item 5 - If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.

Significant differences were found between Users and Non-Users on this item. Both groups expressed considerable agreement with

this statement: 75 percent of the CR-NC Users and 67 percent of the Non-Users. The results indicate that most undergraduates would take the University College requirements on a CR-NC basis if they had the opportunity.

Item 6 - Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.

There were significant differences between the groups on this item. The Users expressed a more favorable attitude toward this statement. The results indicate that students desire a lower decision-making period involving choice of a grading system.

Item 7 - A student should be able to take as many courses as he wishes using the CR-NC option.

A significant difference was assumed between the groups on this item. Majorities of both groups expressed a negative attitude toward extending the Credit-No Credit system. There appears to be an apparent satisfaction with the present numbers of credits that may be taken on this basis.

Item 8 - Credit (CR) in a CR-NC course should be given for a 1.00 or higher rather than the present 2.0 or higher minimum.

A significant difference was assumed between the groups on this item. The Non-User group expressed a slightly more favorable attitude toward this statement. The results indicate that more Non-Users than Users favor lowering the minimum requirement for credit.

Hypothesis 6.--The sixth hypothesis dealt with differences among classes on the eight questionnaire items. Significant

differences were found in three of the items. These are discussed below:

Item 1 - Grades tend to stimulate me to study harder.

Significant differences were discovered between Freshmen and Sophomores and Freshmen and Seniors through using the Scheffe' Post-Hoc Contrasts. Freshmen expressed the most positive attitude toward this statement followed by Juniors, Seniors and Sophomores. There appears to be some support for the contention that Sophomores display less than an adequate concern for achieving high grades. An inference that can be drawn from these results is that grades stimulate Freshmen to study but as they become Sophomores, grades do not provide this type of stimulation, and as students become Juniors and Seniors, grades again serve this function.

Item 2 - I plan to attend a graduate or professional school after I graduate.

The significant contrast among the classes for this item was between Freshmen and Seniors. The Freshmen responses show the highest level of disagreement with this item followed by Sophomores, Juniors and Seniors. The results indicate that as students progress in their academic careers, the desire for graduate school attendance increases.

Item 4 - Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.

Significant differences were found between Freshmen and Juniors on this item. Freshmen expressed the highest degree of agreement

with this item followed by Sophomores, Seniors and Juniors. Knowledge of graduate school opinions among Freshmen may be a factor in the decreasing numbers of students electing to take the CR-NC option. This item also had the largest number of "No Response" and "Don't Know" responses.

Hypothesis 7.--This hypothesis was concerned with differences among students in low, middle, and high grade point average categories on eight questionnaire items. Significant differences were found in three of the items. Each is discussed below:

Item 2 - I plan to attend a graduate or professional school after I graduate.

Significant differences were found between the middle and high group. The lowest grade point average category display the most agreement with this item, but the small number of respondents to this item (N = 21) in the low category makes it difficult to draw conclusions. The significant difference between the middle and high groups was found with large groups (N = 334, N = 267). The results indicate that students in high grade point categories express plans to attend graduate school moreso than students in the middle category.

Item 3 - I am generally satisfied with the present grading policy at M.S.U.

The significant contrast among the groups in this item was the middle and high grade point average category. The results indicate that as grade point average increases, satisfaction with grading policies increase.

Item 7 - A student should be able to take as many courses as he wishes using the CR-NC option.

Two significant contrasts were discovered among the three groups on this item. Significant differences were found between the lowest and highest categories and the middle and highest categories. The lowest category was in most agreement with this statement followed by the middle and high. The results indicate that students in the higher grade point average category do not want to extend the CR-NC option to the degree that middle and low grade point average categories do.

Hypothesis 8.--This hypothesis considered the comparison of attitudes expressed by students and faculty concerning the use of grades. Three groups, faculty, CR-NC Users, and Non-Users, were compared on the item whether grades tend to stimulate students to study. Ninety-two percent of faculty members interviewed expressed agreement with this item. CR-NC Users expressed the lowest degree of agreement; sixty-one percent expressed a favorable attitude. The results of the comparison showed that a higher percentage of faculty members than students express the attitude that grades serve the function of stimulating students to study.

Hypothesis 9.--This hypothesis was concerned with the comparison of expressed attitudes by teaching faculty members, students who used the CR-NC option and students who did not use the option. The item that was used for this comparison was concerned with whether students should be able to decide at any time during the term whether to receive a grade or Credit-No Credit. The highest percentage of

agreement with allowing students this option was the CR-NC Users followed by Non-Users and faculty members. The results of this description show that a higher percentage of students than faculty members express a favorable attitude toward extending the time period for grading system decision-making. Sixty-eight percent of faculty interviewed expressed the opinion that the present CR-NC grading option should be continued.

### Summary, Implications and Recommendations

#### Summary

Only a small percentage of the total undergraduate population take advantage of the CR-NC system. In each of the Fall Terms, 1968-1973, described in this study, the percentage of Users was consistently below four percent. Predominant use was by Seniors, followed by Juniors, Sophomores and Freshmen.

In order to investigate the grade point average levels of Users, students who had used the option were categorized according to grade point average. The mean grade point average among Users was consistently higher than the mean average for each respective class, except for Freshmen. Grade point average levels for Juniors and Seniors who used the option were consistently above the 3.00 level.

In order to investigate whether students who use the option take classes far removed from their major, ten classes were selected and numbers of students in declared majors were listed. Majors were then categorized according to "Within College" of the declared major or "Outside College" of the declared major. The results showed that



very few students take courses on a CR-NC basis within their major's College, although many students may use the option in courses needed to fulfill "Outside College" requirements.

Two questionnaires were used to sample opinions expressed by Users and Non-Users of the CR-NC option. The significant differences between the two groups on six of the eight common questionnaire items indicated that the population of CR-NC Users differed with respect to these items from the Non-User group. The reason for this difference may not have been due to the fact that classes were and were not taken on a CR-NC basis, but because the population of CR-NC Users differs from the general population of undergraduates. Users are in the higher grade point average categories as described in the descriptive portion of the study. CR-NC Users as compared to Non-Users expressed:

1. less agreement with the statement that grades stimulate students to study;
2. more agreement with the statement of planning to attend a graduate or professional school;
3. more agreement with the statement that if University College courses could be taken on a CR-NC basis, they would have:
4. more agreement with the statement extending the decision to take a class on either a graded or CR-NC basis;
5. less disagreement with the statement of being able to take as many courses as desired on a CR-NC basis;
6. less disagreement with the statement of lowering the minimum requirement for credit from a 2.0 to a 1.0.

In the items concerned with satisfaction with present grading practices and knowledge of admissions officers attitudes toward CR-NC Users, no significant differences between the groups were found.

In order to investigate the sources of differences between the groups, Multivariate and Univariate  $F$  tests were used with Scheffe' Post-Hoc Contrasts. Significant differences were found between Freshmen and Sophomores, and Freshmen and Seniors on the item concerning grades providing a stimulus to study. Significant differences were found between Freshmen and Seniors on the item measuring plans for graduate school attendance. Significant differences were found between Freshmen and Juniors on the item concerned with graduate school admissions officers attitudes toward CR-NC Users.

Grade point average categories were compared according to responses on the eight common questionnaire items. Significant differences were found between the middle and high groups on the item concerning plans to attend a graduate or professional school after graduation. Significant differences were found between middle and high grade point average categories on the item concerned with satisfaction with grading practices. On the item stating that students should be able to take as many courses as they wish using the CR-NC option, significant differences were found between the lowest and highest categories, and the middle and highest categories.

Faculty at Michigan State expressed a more negative attitude toward extending the number of courses that may be taken on a CR-NC basis than both student Users and Non-Users of the option.

### Implications

The Credit-No Credit grading option is not widely used. Although a majority of students who had not used the option expressed plans to take a course on this basis, it is unlikely that they will. The relatively consistent percentage of Users does not show a rising pattern of use; rather, a slight decline was shown. If the University College requirements were to be offered on this basis, usage would undoubtedly increase.

Since students express relative agreement with the present grading system, the process of grading seems an accepted part of academic life. An extension of the two-point grading system seems unwarranted in light of student opinion concerning this issue.

The rationale for use of the CR-NC option was that it would stimulate students to explore outside their major areas. When courses taken on this basis were examined, results indicated that students used the option for classes outside the college of their major. Closer examination showed, however, that in many instances courses were taken to fulfill an "Outside College" requirement of the major.

Since the same prerequisites are required in order to take a class on a CR-NC basis or a regular basis, many students may be inclined to use the option for reasons other than those for which it was intended. If criteria for course admittance were altered to accommodate the option, students would be more likely to use the option for exploration. If a student could take a course on a CR-NC basis and have the option of receiving the grade assigned prior to CR-NC conversion, intended reasons for use could be realized. The grading option

could be used in initial enrollment in a course and then repeated, if desired, on the regular graded basis. This would encourage students to use the option in courses in which they are academically unfamiliar. The use of the system by students in the higher grade point average ranges for outside college requirements seems to typify CR-NC use.

Although over 80 percent of Users express that they felt more at "ease" in CR-NC graded courses, less than 35 percent of the Users indicated that students "learn" more in these courses. Present student use of the option does not seem to increase student motivation in classes.

If slight changes were made in the two-point grading system, incidence of use of the option does not seem likely to increase, but the reasons for use could be aligned with the rationale purported for the initiation of the option.

### Recommendations

1. The CR-NC option seems appropriate for upperclassmen on a limited basis. Freshmen who presently use the option have grade point averages that are lower than the class average.

2. Most students support the use of grading at the undergraduate level. Students indicated that they did not desire to extend the CR-NC system to include more classes. Extension of the option seems inadvisable.

3. Although students generally favor an extension of the CR-NC option to include University College courses, the lack of student

awareness concerning ramifications of taking a few courses on a CR-NC basis makes the extension seem inadvisable.

4. The 2.0 minimum requirement for credit in a CR-NC seems appropriate. If there is a desire to enroll more students on this basis, the requirement could be lowered to a 1.0.

5. Students should be made aware of negative ramifications concerning use of the CR-NC system (i.e., the Report by the American Association of College Registrars and Admissions Officers stated that 44 percent of institutions reported that pass-fail type grades were disregarded for students who transfer, and 26 percent indicated that admission to their programs were jeopardized by a substantial number of pass-fail type credits; the emphasis on the Graduate Record Exam if a student takes a "number" of credits using a grading option).

6. The CR-NC system seems a viable option for undergraduates. It should be continued with the following alterations:

- a. The option should be offered primarily to Juniors and Seniors.
- b. A reduction of the maximum number of credits that can be taken on the CR-NC basis (30) should be considered.
- c. Undergraduate advisors should be made aware of reservations expressed by graduate school admittance personnel concerning this issue. They could relay this information to advisees.
- d. Students should have the option of repeating a course on a regular basis after taking the course on a CR-NC basis.
- e. If a student desires, he should be able to receive the grade he earned in the CR-NC class.
- f. Prerequisites for courses taken on a CR-NC basis should be waived if agreement can be reached between the individual student and the department offering the course. This may result in an instructor knowing who the CR-NC

students are, but this change could induce students to take courses outside their major requirements.

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## APPENDICES

**APPENDIX A**  
**STUDENT QUESTIONNAIRES**

## QUESTIONNAIRE SENT TO CR-NC USERS

For each item, respond by circling the letter(s) of the appropriate category of the key:

KEY: SA - if you strongly agree with the statement  
 A - if you agree with the statement  
 D - if you disagree with the statement  
 SD - if you strongly disagree with the statement

Grades tend to stimulate me to study harder.	SA	A	D	SD
I felt more at ease in the CR-NC (credit-no credit) course than in other courses.	SA	A	D	SD
Students learn more in courses graded on a CR-NC basis than in comparable courses with regular grades.	SA	A	D	SD
I plan to take more courses on a CR-NC basis.	SA	A	D	SD
If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	SA	A	D	SD
A student should be able to take as many courses as he wishes using the CR-NC option.	SA	A	D	SD
The CR-NC option gives students an opportunity to take courses outside of his/her major area without fear of lowering the grade point average.	SA	A	D	SD
I am generally satisfied with the present grading system at M.S.U.	SA	A	D	SD
Credit (CR) in a CR-NC course should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	SA	A	D	SD
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	SA	A	D	SD
Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC option.	SA	A	D	SD
I plan to attend a graduate or professional school after I graduate.	SA	A	D	SD
I would have studied harder in the CR-NC course I took during Winter Term, 1974, had I been grade on a regular basis.	SA	A	D	SD

## QUESTIONNAIRE SENT TO CR-NC USERS Continued.

Taking the CR-NC option allowed me more time to study harder for my other courses.	SA	A	D	SD
I would not have taken the course that I took on a CR-NC basis during Winter Term, 1974, if the grading option were not available.	SA	A	D	SD
I was satisfied with my decision to take a course on a CR-NC basis.	SA	A	D	SD
The CR-NC option should be publicized more.	SA	A	D	SD

COMMENTS:

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Student # \_\_\_\_\_

For each item, respond by circling the letter(s) of the appropriate category of the KEY:

KEY: SA - if you strongly agree with the statement  
 A - if you agree with the statement  
 D - if you disagree with the statement  
 SD - if you strongly disagree with the statement

Current grade point average:  
 (check one category)  
 \_\_\_\_\_ 3.00 and above  
 \_\_\_\_\_ 2.00 to 2.99  
 \_\_\_\_\_ 1.99 and below

Grades tend to stimulate me to study harder.	SA	A	D	SD
I am familiar with the requirements of graduate schools.	SA	A	D	SD
I plan to attend a graduate or professional school after I graduate.	SA	A	D	SD
I am generally satisfied with the present grading system at M.S.U.	SA	A	D	SD
Admissions officers at graduate schools do not weigh as heavily the grade point average if a student has used the CR-NC (credit-no credit) grading option.	SA	A	D	SD
If the CR-NC option was available for University College courses, I would have taken these courses using the CR-NC option.	SA	A	D	SD
A student should be able to take as many courses as he wishes using the CR-NC option.	SA	A	D	SD
Credit (CR) in a CR-NC course should be given for a 1.0 or higher rather than the present 2.0 or higher minimum.	SA	A	D	SD
Students should be able to decide at any time during the term whether to receive a grade or credit-no credit.	SA	A	D	SD
I plan to take a course on a CR-NC basis in the future.	SA	A	D	SD

COMMENTS:

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**APPENDIX B**  
**COVER LETTERS**

MICHIGAN STATE UNIVERSITY

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University College  
Office of Evaluation Services  
South Kedzie Hall

East Lansing Michigan 48824

April 29, 1974

Dear Student:

The CR-NC (credit-no credit) grading system offered at Michigan State is being evaluated so that we may understand how widely and effectively it is being used.

As a user of the option during Winter Term, 1974, you are obviously in the position to provide the most meaningful input.

We would appreciate your responses to the enclosed questionnaire. Please complete the questionnaire and mail it using the enclosed envelope. Under no circumstances will your responses be released to anyone.

Thank you for your cooperation.

Sincerely,

Frank Vivio

Dr. Arvo Juola  
Acting Director

Enclosures

MICHIGAN STATE UNIVERSITY East Lansing Michigan 48823

University College Office of Evaluation Services 202 South Kedzie Hall

April 29, 1974

Dear Student:

The CR-NC (credit-no credit) grading system offered at Michigan State is being evaluated so that we may understand how widely and effectively it is being used.

To adequately evaluate this grading option, we need input from students who have used and those who have not used the CR-NC system. You have been randomly selected as a student who did not use the option during Winter Term of the 1973-1974 academic year.

We would appreciate your responses to the enclosed questionnaire. Please complete the questionnaire and mail it using the enclosed envelope. Under no circumstances will your responses be released to anyone.

Thank you for your cooperation.

Sincerely,

Frank Vivio

Dr. Arvo Juola  
Acting Director

Enclosures

**APPENDIX C**  
**COVER LETTER FOR FOLLOW-UP**

MICHIGAN STATE UNIVERSITY

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UNIVERSITY COLLEGE - OFFICE OF EVALUATION SERVICES  
SOUTH KEDZIE HALL  
EAST LANDING, MICHIGAN 48824

May 13, 1974

Dear Student:

Approximately two weeks ago you should have received a questionnaire concerning the CR-NC (credit-no credit) grading option at Michigan State. This letter is being written to encourage you to complete the questionnaire.

Enclosed is another copy of the questionnaire. I urge you to complete and send it as soon as possible so that you may have an impact in the grading option evaluation.

Thank you for your cooperation.

Sincerely,

Frank Vivio

**APPENDIX D**  
**FACULTY QUESTIONNAIRE**

## FACULTY QUESTIONNAIRE

### ITEMS:

Do you consider yourself familiar with the CR-NC grading option?

One of the major reasons for offering the CR-NC grading option is to offer to students an opportunity to explore outside their major area. Do you think that this is being accomplished? Why? Can you give me more information on the use of the option in your department?

Do you think that grades stimulate students to study?

Do you think that students should be able to decide at any time during the term whether to receive a grade or credit-no credit?

Do you think that professors should be told which students are taking their courses using the CR-NC option?

Why do you think students take courses on a CR-NC basis?

Do you think that the present CR-NC option should be continued or do you think it should be changed? Can you suggest how you think it should be changed?



**APPENDIX E**

**FACULTY COMMENTS**

Faculty Comments:

Item - One of the major reasons for offering the CR-NC grading option is to offer to students an opportunity to explore outside their major area. Do you think that this is being accomplished? Can you give me more information on the use of the option in your department:

"CR-NC courses are taken when students take a heavy load."

"In this department, it is used to give students an opportunity to explore."

"I encourage students to use it."

"It isn't used here any more than other departments."

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Item - Do you think that grades stimulate students to study?

"With the system the way it is - yes."

"Some students want structure and need to be required to do something . . . grades can alienate, however, and stress competition rather than cooperation."

"They are one of the things that motivate students."

"Definitely yes."

"To a degree . . . grades are becoming more of a trend with pressure mounting for graduate school, ambitions could be cut off."

"For some students, this is the only way they study."

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Item - Do you think that students should be able to decide at any time during the term whether to receive a grade or credit-no credit?

"Students should be able to change at any time, this way students would drop less courses."

"This is a degree of freedom the students should have."

"No, students are motivated by fear of failure."

"This would defeat the purpose of the course."

"Students should make a commitment at the beginning of a course."

"This depends on the instructor and the type of course."

"It would cost the University a lot of money . . . cause a lot of administrative work."

"The decision should be made before the first exam."

Faculty Comments Continued.

Item - Do you think that professors should be told which students are taking their classes using the CR-NC option?

"It doesn't make much difference."

"Yes, a professor could give a 2.0 instead of a 1.5 if a student was on the borderline."

"No, to avoid bias by the professor."

"Personally, I would like to know."

Item - Why do you think students take courses on a CR-NC basis?

"To broaden the student in areas where he is afraid to venture."

"They want to explore without lowering GPA."

"Relief from the pressure of competition, students do not wish to perform at a high level."

"To avoid GPA ruin."

"Students use it thinking that it is easier to get credit hours to complete their programs."

"Half laziness, half not wanting to make a full commitment."

"To get content without getting a 2.0."

"They think it will be a way of studying without pressure . . . an illusion."

"Students hope to lighten load."

Item - Do you think that the present CR-NC option should be continued or do you think it should be changed?

"Students should be allowed to take a year of CR-NC."

"All classes should be on a CR-NC basis."

"If people want it they should be able to take it."

"There is no trouble with it . . . we should minimize grades."

"Should reduce the number of credits to fifteen."

"Continue it the way it is now."

"I would not want to see it overused."

**APPENDIX F**

**STUDENT COMMENTS**

### Credit-No Credit Users Comments:

"The course was very helpful to me and I have retained what I have learned."

"CR-NC puts less stress on a student and they can get more out of a class than they may with pressure of grades."

"A student should be able to drop the CR-NC option up to five weeks into a term."

"I use the CR-NC option for most of my required classes that are in a subject area I do not have a good background in . . . I am a social work major and I take my science classes on a CR-NC basis."

"I enjoyed my CR-NC class immensely, and was much more at ease in it than in my graded classes."

"Fear of not knowing whether I would get a CR for the course made me study slightly more than I would for a regular class."

"CR-NC is a good thing on a limited basis. If a student takes too many courses CR-NC, his GPA may be viewed with skepticism."

"It is good for courses that a student is unsure of, bad on record for graduate schools."

"It gave me a chance to evaluate my proficiency in an area unrelated to my major without affecting my GPA."

"CR-NC gives me more confidence to take courses well outside the scope of my major to explore other areas . . . I have enjoyed those classes that I took CR-NC and might not have ventured to do so without the option."

"I don't think I study less using the CR-NC option but rather that some of the pressure is removed."

"A CR-NC class allows a more relaxed atmosphere and I feel a better learning experience occurs."

"It is up to the individual to take advantage of this option. It allows you to vary your study schedule, to give more time for difficult courses."

"I enjoy taking classes that are not required in my major . . . It makes a more well rounded person."

"I really wish that I could have changed to a graded basis after the mid-term."

"Taking a CR-NC course gives the student an opportunity to study the things that he thinks are important in a class."

"The CR-NC option is of great value."

Non-User Comments:

"I strongly agree with the CR-NC option but since we were taught from age 7 onward to work for a reward, by the time we get to college, we are incapable of using the CR-NC as it was meant to be."

"A student should be able to find out half way through the quarter what his grade is and then be able to switch to CR-NC if it is to his advantage."

"A CR-NC option would be good in University College courses . . . . My grades in these courses were lower than those in my major."

"Most of my classes in my last two years were required for my major-- or ones that would help my GPA . . . . If I would have known about the CR-NC option in my Freshmen and Sophomore years, I would have made use of it."

"I don't believe that a change in the grading system will help as much as a drastic change in the way learning is presented."

"The CR-NC idea is good, but the policies governing its use vary too much from one college to another."

"I realize that grades are necessary, but I know due to many circumstances only the professor decides upon the grade without the student being able to discuss it before it is issued . . . this is the only argument I have about issuing grades."

"My disagreement with the CR-NC option is my own personal belief . . . I do agree with the system as being offered as a choice for other people."

"I would have taken the University College requirements CR-NC if I could have."

"It would be worth considering having the classes in one's area of concentration on a CR-NC system . . . . I have found that I worked hardest when I wanted to know the information regardless of the grading system."

"As it is now, the pressure of keeping grades up is a bigger reality to most students than is learning the actual content of a course . . . . Maybe with the pressure of grades taken off, you could devote more time and energy to learning."

"CR-NC should be used only for University College requirements."

"Too often the CR-NC option gives a student an excuse not to exert himself in a course."

"It generally seems to be a 'cop-out' for minimizing effort . . . . I never used it but can see how it may take pressure off students."

"There should be a presentation of the CR-NC system at orientation."

"I really don't know enough about it to say . . . . But seems like grades are better, and benefit you more."

"I feel the CR-NC option does not give the 3.5 or better students the credit they deserve."