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THE RELATIONSHIP OF RESEARCH PREPARATION TO DURATION, ATTRITION AND RESEARCH COMMUNICATION OF DOCTORAL CANDIDATES IN EDUCATION, MICHIGAN STATE UNIVERSITY

By

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ABSTRACT

THE RELATIONSHIP OF RESEARCH PREPARATION TO DURATION OF PROGRAM, RESEARCH COMMUNICATIONS STYLE AND ATTRITION OF DOCTORAL CANDIDATES IN EDUCATION, MICHIGAN STATE UNIVERSITY

By

Natalie L. Sproull

The Problem

Among the problems associated with doctoral study in Education are those of: (1) prolonged duration of the doctoral program, (2) attrition of doctoral candidates at the "all but dissertation stage", and (3) research communication that is less effective than considered desirable.

Therefore, it was the purpose of this study to investigate the relationship of the amount of research preparation, through coursework, that doctoral candidates in Education complete to: (1) duration of the doctoral program from admission to Ph.D., (2) attrition at the ABD stage, and (3) effective communication of research through the dissertation abstract.

In the model from which the hypotheses were derived it was posited that the more task preparation an individual receives, the better will be his performance. Thus, the hypotheses stated that the more research preparation a doctoral candidate completes during the doctoral program:

(1) the shorter will be the elapsed time from admission to doctoral coursework to completion of the doctoral program, (2) the more effective will be the research communication in the dissertation abstract and (3) the less likely it is that the candidate will drop out at the ABD stage.

Procedures

The Population and Setting

The population selected for this study included all doctoral candidates who: (1) took their doctoral program at the College of Education, Michigan State University, (2) transferred no more than nine credit hours from another institution, and (3) were enrolled in one of four departments in the College of Education: Elementary and Special Education, Secondary Education and Curriculum, Administration and Higher Education and Counseling, Personnel Services and Educational Psychology, (4) completed comprehensive examinations in the two year period from Fall term 1963 through Summer term 1965.

Candidates who met the above criteria and received their degree by the end of Summer term 1968 are termed Graduates. Candidates who had not graduated by the end of Summer term 1968 exceeded the university required time limit of completion of the degree within three years of completing comprehensive examinations, and thus are considered ABD's.

Of the 204 doctoral candidates who met the above criteria, 180 were Graduates and 24 were considered ABD's.

Data Collection and Instrumentation

Data were collected from the doctoral candidate's university records and dissertation abstract. Duration of the doctoral program was measured by number of terms of elapsed time from admission to doctoral coursework to graduation (Ph.D./Ed.D.). Attrition rate was computed on the number of doctoral candidates (ABD's) who had not graduated by Summer term 1968. Effective research communication was defined by the amount of research information communicated in the dissertation abstract, as rated on the Research Information Index; the higher the score on the RII, the more effective is the research communication. Interrater reliability on the RII was .87. Amount of research preparation was defined as the total number of credits completed by doctoral candidates in courses categorized by faculty members as research preparation courses.

The hypotheses were tested and the data analyzed by computing Pearson Product-Moment correlations, point biserial correlations, analyses of variance and chi squares. The .05 level of significance was preselected as the criterion for rejecting the null hypotheses.

Major Findings

Hypotheses

The findings supported two of the three hypotheses derived from the premise of the model. That is, the more research preparation these doctoral candidates in Education completed during the doctoral program, the more likely it was that they: (1) completed the doctoral program in a shorter amount of elapsed time ($r = -.21$) and (2) communicated research more effectively ($r = .24$). However, the premise did not hold for attrition. The correlation of -.06 indicated that the amount of research preparation completed was not related to attrition at the ABD stage.

Duration

1. Mean elapsed times were: (1) B.A.-Ph.D., 13 1/2 years, (2) M.A.-Ph.D., 8 1/2 years, and (3) admission to Ph.D. 5 1/2 years.

2. Of the 204 doctoral candidates, 43% (88) extended one or both of the university time criteria of: (1) completion of comprehensive examinations 5 years after admission or (2) graduation 3 years after comprehensive exams.

3. Of the 88 candidates who extended the time criteria, 76% (67) extended admission to comprehensive exams past 5 years.

4. The three time periods considered extended are: (1) B.A. to M.A., 5 years, (2) M.A. to admission, 3 years, and (3) admission to completion of coursework, 3 3/4 years.

5. Shorter duration of the doctoral program from admission to graduation was associated with: (1) a greater amount of research preparation, (2) enrolling for a Ph.D. rather than an Ed.D., (3) holding an assistantship, (4) higher junior-senior undergraduate and doctoral GPA, (5) fewer total program credits, and (6) a behavioral science undergraduate major.

6. Duration from admission to comprehensives of four years or less is similarly related to the variables listed above in addition to: (1) having a cognate in Psychology, and (2) being male.

7. Affiliation with the department of Counseling, Personnel Service and Educational Psychology was associated with: (1) shorter duration from admission to Ph.D., (2) a greater amount of research preparation, (3) a behavioral science undergraduate major, and (4) a cognate in Psychology.

8. There were no departmental differences in: (1) proportion of Ph.D.'s, (2) proportion of assistantships, (3) junior-senior undergraduate and doctoral GPA, (4) total number of program credits, and (5) proportion of males.

Attrition

1. The attrition rate was 12% for doctoral candidates at the ABD stage.

2. ABD's completed more total program credits than Graduates.

3. ABD's did not differ from Graduates in any other elapsed time measures except extending the time after comprehensives past three years.

Effective Research Communication

1. Average score on the Research Information Index was 11.27 of a possible total score of 16 points.

2. More effective research communication was associated with: (1) a greater amount of research preparation, and (2) affiliation with the department of Counseling, Personnel Services and Educational Psychology.

Amount of Research Preparation

1. Average number of courses, categorized as research preparation, completed by the doctoral candidates was 5 1/2 courses.

2. The average number of courses in each kind of research preparation course were approximately: (1) two courses in theory, theory construction or logic, (2) one course in research methods, (3) one course in measurement or evaluation and (4) one and a half courses in statistics or mathematics.

3. The average number of research preparation courses ranged from approximately three to eight courses over the four departments.

4. Candidates from the department of Counseling, Personnel Services and Education Psychology and candidates with a cognate in Psychology had a greater amount of research preparation in theory, measurement and statistics.

5. Candidates from the department of Secondary Education and Curriculum and candidates with a cognate in Sociology had a greater amount of research preparation in research methods.

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CHAPTER I

INTRODUCTION

Purpose of the Study

The primary objective of this study is to investigate hypothesized relationships between the amount of research preparation, as measured by number of course hours, completed during the doctoral program by doctoral candidates in Education and:

1. duration of the doctoral program from admission to graduation;
2. completion of the doctoral program (Graduates) or attrition at the dissertation stage (ABD's);
3. effective research communication, as measured by the amount of research information communicated in the dissertation abstract.

The Problem

To produce the number of doctorate holders required by societal demands is a task of increasing concern to the universities. Government and business employers, who will continue to need large numbers of highly educated people, have also expressed concern about the limited production of doctorate holders [33:V]. The concern is apparently well founded. For example, Cartter [14:232] estimates that one Federal agency alone could absorb the projected

total output of doctoral graduates in engineering from 1968 to 1972.

One result of this growing demand for doctoral graduates is that universities are being forced to more closely examine their own processes and products. As the universities attempt to identify ways of increasing the supply of doctorate holders, attention is being focused not only on means of attracting individuals to doctoral study but also on means of improving the graduation rate of candidates already enrolled in doctoral study.

This focus on improving the doctoral graduation rate stems largely from results of an extensive survey of graduate education conducted by Berelson [9:156-181] who concluded that:

1. duration of doctoral study is a major issue in graduate education;
2. the number of ABD's (All But Dissertation) is increasing.

Despite the general recognition of the problems, a paucity of data exists regarding factors related to duration and attrition at the doctoral level. In order to even partially furnish the number of doctorate holders required now and in the future, the universities should begin to initiate procedures which would encourage doctoral candidates to complete the doctorate, and to complete it within an optimal time span. In order for such procedures to be maximally effective, knowledge of

the major factors which are associated with extended duration and attrition is desirable. Procedural decisions based on "hard data" are usually more effective in producing the desired outcomes than are procedural decisions based on "best guesses".

The Duration Issue

Ideal Time and Actual Time

There seems to be general consensus [35:2] that three or four calendar years beyond the bachelor's degree are sufficient to complete all requirements for the doctorate. Yet, in two recent studies [31, 35] average elapsed time from entry into post-masters work to completion of the doctorate ranged from four to nine years in four academic fields.

The National Academy of Science report. Doctorate Recipients from United States Universities, 1958-1966 [23:69-70] shows similar figures. Elapsed time medians from M.A. to Ph.D. for over 30 fields which had doctorate recipients between 1964 and 1966, ranged from 3.7 to 8.8 years. Elapsed time medians of over 4 years were reported in all fields except five in the physical sciences.

Time in Attendance

However, it should be noted that the actual time spent in attendance averages between one-third and one-half of the total elapsed time and does not vary

much from the normal time which most educators think a doctoral program should require [21:93]. Berelson [10:129] reports actual time spent in doing work for the degree in full-time equivalents of 2.8 years in Education and 3.5 years in the Arts and Sciences. Wilson [35:27] reports mean calendar year equivalents in attendance which range from 2.9 to 4.0 in four academic fields.

The data indicate that total elapsed time between entry into a doctoral program and completing the doctorate, rather than time in attendance, is excessively lengthy. Thus, as Grigg [21:93] points out, efforts should be directed toward reducing total elapsed time of the doctoral program so that it more nearly corresponds with time needed to complete the program. To reduce the total time span of the degree process would not only increase the supply of doctorate holders (more graduates per year) but would also lengthen the span of the scholar's productive life.

Candidate Control of Time

Although some universities have set time limits at certain stages of the doctoral program (e.g., that orals be within 3 years after comprehensive exams), there usually is no inviolate time requirement for duration of doctoral study. Thus, duration of doctoral study reflects the rate

of progress of the student in a program which has neither a fixed attendance pattern nor a rigid time schedule.

Duration of doctoral study then, is largely controlled by the individual's actions. In progress toward the doctorate the candidate may attend full-time or part-time, on-campus or off-campus; he may enter the doctoral program at an early age or delay entry until he is older; he may be employed full-time, part-time or not at all; and there may be long periods of time in which he does no work directly related to completing the degree.

This loosely structured process of doctoral study does not lend itself easily to either change or analysis. Yet, systematic study and analysis is needed before decisions can be made about probable effective approaches to reduction of the time taken by doctoral candidates to complete their program of study.

The ABD Issue

According to Berelson there is a large group of doctoral candidates (estimated to exceed 10,000) who have completed all requirements for the doctorate except the dissertation. Berelson [9:171] states:

> They are so numerous and so visable that they have been given a 'degree' of their own. They are the ABD's--'All But Dissertation'.

Estimates of attrition of doctoral candidates range from 31 per cent [31] to 40 per cent [9]. Although these

estimates are similar to undergraduate attrition figures, the results of attrition at the doctoral level, and particularly at the ABD level, are relatively more serious in terms of more immediate production of doctorates.

Concern about attrition at the ABD level is related to the swelling of graduate enrollments which has begun to create the many problems concomitant with expansion. According to Cartter [14:227] expansion in all fields is expected to continue. Under such conditions, faculty time and university resources would be more effective toward attaining the desired outcome if devoted to doctoral candidates who would complete the degree rather than drop out.

Chase [15:31] estimated a "rock bottom figure" of 4,500 ABD's for all graduate schools in the Nation in 1960. This is indeed a rock bottom figure because he defined ABD's as those candidates who had completed all course requirements at least 3 years prior to the study, whom the graduate deans would recommend for a one year fellowship to complete the dissertation. Not only was the figure of 4,500 ABD's an admitted underestimate in 1960 but also, with increasing graduate enrollments, the number of ABD's has undoubtedly increased.

There is little question about the need for information about, and attention to, the ABD problem. As Chase [15:30] points out, "the supply of ABD's is the most

obvious potential source for increased numbers of doctorates in the shortest possible time".

Doctoral Study in Education

The problems of extended duration and attrition are particularly crucial for doctoral candidates in the field of Education. This is partially because doctoral production in the field of Education is larger than any other field except for the Physical Sciences [2:14, 23:4], and, of the non-science areas, is the most rapidly expanding field [14:229].

A comprehensive series of studies conducted by the American Association of Colleges for Teacher Education focused on conditions affecting pursuit of the doctoral degree in the field of Education. Results of these studies were published in four volumes [1,2,3,4], which provide a major source of information about doctoral study in Education.

Information from the AACTE studies suggests reasons why duration and attrition are widespread in the field of Education. In particular, many doctoral candidates in Education are likely to be:

1. over 30 years old at admission to the doctoral program [3:99];
2. employed during their doctoral program [3:100];
3. off-campus residents during their doctoral program [3:99];

4. married with families during their doctoral program [3:10];

5. self-supporting during their doctoral program [3:99].

Duration of doctoral study is lengthy for doctoral candidates in Education. Time lapse medians reported by the NAS [23:69-70] indicate that doctoral graduates in Education take longer to complete their doctoral study than do doctoral graduates in any other of over thirty academic fields.

The number of ABD's is large in Education. Chase [15:31] reported that Education has the largest number of ABD's of over sixty fields. Berelson [10:130] concludes that Education has a much more serious problem with ABD's than do the Arts and Sciences.

There is little doubt that administrators and faculty in the field of Education are concerned about the problems of extended duration and attrition of their doctoral candidates. The AACTE Conference Report [3:74] states that "there is no question that the overall time span now current can and must be shortened". In addition, recommendations of the Conference focused on the need for a study of the reasons for drop-outs in the doctoral program [3:28]. The report emphasized that "the major concern should be directed toward those factors, other than academic incompetence, which caused students to fail to complete requirements" [3:66-68].

The Dissertation Process

Berelson [9:156-181] concluded from his study that the dissertation is one of the major causes of too much elapsed time. This conclusion is supported by Wilson's [35:43-46] report that both graduate faculty and recent graduates cited the dissertation as a major factor in increasing the duration of doctoral study. According to Grigg [21:61], "the dissertation has been a stumbling block for many students and has contributed more than is warranted to an extended length of elapsed time between matriculation and graduation".

The dissertation process may also be a factor in attrition at the ABD stage. For example, Tucker, Gottlieb and Pease [31:278] studied attrition of doctoral students from four academic fields and found that a large number of drop-outs indicated that the research requirement was one of the main reasons for their attrition. Grigg [21:93] also emphasizes the crucial role of the dissertation in the plight of the ABD. He adds [21:94] that although "the dissertation is now considered more of a training device, the length of time to complete the dissertation has been increased".

Thus, it appears that one of the pivotal processes involved in both excessive duration of doctoral study and attrition of doctoral candidates is the conducting and reporting of reasearch for the dissertation.

Amount of Research Preparation

As increasing concern is being focused on the role of the dissertation in duration and attrition of doctoral candidates, there is concurrent questioning of the adequacy of the programming of doctoral candidates for the dissertation task. For example, one memorandum to a college faculty [20:10-11] expressed concern about the adequacy of the programming of doctoral candidates for the dissertation tasks of: (1) writing skills, (2) research design, (3) data analysis and interpretation, (4) logic and (5) statistics and mathematics.

Apparently the concern about adequate research preparation holds not only with faculty but also with recent graduates and drop-outs. Results of two recent studies [31,35] indicate that graduate faculty, recent recipients of the doctorate, and drop-outs of the doctoral program all cite the amount of research preparation a candidate receives as a factor related to both attrition and duration of doctoral candidates. Suggestions for time reduction made by doctoral graduates in Wilson's [35:155] study included: (1) more research preparation, (2) better research preparation and (3) earlier initiation of research preparation.

Effective Research Communication

As the adequacy of research preparation for the dissertation task is being questioned, it is apparent

that, apart from the worth and relevance of the problem selected, the dissertation is expected to reflect, and is partially judged upon, some degree of research sophistication. That is, at the end of his program of study, the doctoral candidate is expected to demonstrate his research prowess and sophistication not only in conducting but also in reporting the research.

Research reporting is an important aspect of the research prowess and, according to the American Institute for Research [5:1], effective communication of research is an essential function of researchers. Effectiveness of the communication is defined as the amount of information conveyed to the reader of the research report [5:1].

In an American Institute for Research study [5] in which research performance was evaluated by rating dissertations, the results indicated that research communication in dissertations is not as effective as might be desired. However, the results of this study were somewhat tenuous because of the small amount of agreement between raters. It is possible that the low interrater agreement was partially a result not only of disagreement on what constitutes a "good" product but also the difficulties concomitant with evaluating unique and lengthy dissertations which contain few communalities. That is, dissertations can vary in many ways such as format, length, wording and content.

However, because almost all doctoral graduates conduct and report research for their dissertations, a common research report, the dissertation abstract, is available for these doctoral graduates. The dissertation abstract is a product of the doctoral candidate which summarizes the research problem, procedures and findings. The abstract also has the advantage of being short. It requires more sophistication of the writer to include the information considered essential to understanding the research in a short report than in a long one. The results of the AIR study, as well as their position on the importance of research communication, indicate that the amount of information conveyed to the reader of the dissertation abstract would be an acceptable measure of effective research communication. Furthermore, it is expected that an individual who is adequately prepared in research will know the kinds of information necessary to include in the research report in order to communicate effectively to the reader. Therefore, it is posited here that the more research preparation a doctoral candidate receives, the more effective will be the research communication.

In view of the concerns about attrition, extended duration and research communication of doctoral candidates in Education, and the apparently crucial role of the research requirement in these problems, the objective

of this study is to investigate the amount of research preparation, and other institutional and demographic variables, which may distinguish between:

1. doctoral graduates in Education who spend a short amount of elapsed time to complete their doctoral program and doctoral graduates who spend an extended amount of elapsed time;

2. graduates of the doctoral program in Education and ABD's (candidates who have completed all requirements for the doctorate except the dissertation);

3. graduates who indicate more effective research communication and graduates who indicate less effective research communication.

Summary

Doctorate production by graduate schools is not increasing as rapidly as the demand for individual's with doctorates. Thus, the universities are focusing on reduction of: (1) time spent by candidates in progress toward the doctorate and (2) attrition rates of doctoral candidates at the ABD level, as means of improving the graduation rate of doctoral candidates. The problems of extended duration and attrition are particularly crucial in the field of Education.

Concern has also been expressed about the effectiveness of research communication of doctoral candidates. The amount of research preparation for the dissertation requirement has been suggested as a major factor in extended duration of doctoral study, attrition of doctoral candidates and effective research communication by doctoral candidates.

CHAPTER II

RELATED RESEARCH AND LITERATURE

The Duration Issue

Time Lapse Figures

A major study on duration of doctoral work was conducted by Kenneth Wilson [35] who gathered data from: (1) over 1900 recipients of a doctorate, (2) 25 graduate deans and (3) 100 representatives of graduate departments from 23 southern graduate institutions. Wilson [35:6] reports that, although a small number of studies bear somewhat on doctoral time lapse, none has focused exclusively on the duration issue.

In Wilson's regional study, the selection of academic fields was limited to Biosciences, Physical Sciences, Social Sciences and Humanities. The field of Education, which Wilson [35:9] termed "large", was excluded.

For the fields included in Wilson's study, mean B.A.-Ph.D. time lapse ranged from 7.2 to 14.1 years, with an average overall fields of 9.2 years. Mean M.A.-Ph.D. time lapse ranged from 4.4 to 9.0 years with an average overall fields of 5.9 years.

These time lapse figures are similar to those found by Tucker et al. for Ph.D.'s in the same four fields. Tucker [31:68] reported mean B.A.-Ph.D. time lapse ranging from 7.3 to 11.7 years with an average of 8.9 years. Mean Post-Master-Ph.D. time lapse was reported as ranging from 4.1 to 6.0 years with an average of 4.8 years.

Duration of doctoral study is substantial in all fields. However, duration is longer in the field of Education than in other fields. The National Academy of Science report [23:69-70] indicates that, during the period 1964-1966, median B.A.-Ph.D. time lapse in Education was, at 13.8 years, the highest reported for over thirty fields.

The Masters-Ph.D. median time lapse of 8.4 years in Education was the highest of all fields except for Fine Arts and Music (8.8 years). The field of Education ranked either second highest or highest for all the time lapse indices reported by the NAS.

Factors Related to Duration

In his study, Wilson contrasted faster and slower duration groups on several variables. The faster group was defined as those Ph.D.'s with a B.A.-Ph.D. time lapse of less than the field median. The following are some of the factors which Wilson [35:145] found to be associated with membership in the faster group:

1. lower incidence of pre-doctoral employment;
2. less total time and less part-time attendance;
3. lower incidence of delayed entry;
4. earlier development of interest in doctoral work;
5. greater continuity of major field;
6. broader base of financial support;
7. higher incidence of research-related graduate appointments;
8. earlier completion of preliminary examinations;
9. earlier approval of dissertation topic and more expeditious completion of the dissertation;
10. higher incidence of research or research-related duties in post-doctoral employment;

Duration also varies by sex. The NAS report [23:113] shows median B.A.-Ph.D. time lapse as 13.3 years for males in Education and 16.0 for females in Education. However, registered time between B.A. and Ph.D. is the same for both males and females in Education.

It is apparent from the reported figures that duration of time spent by doctoral candidates in progress toward the degree is: (1) long in all fields, (2) longest for people in the field of Education and (3) far from the ideal time lapse of three to four years.

The ABD Issue

Estimated Attrition Figures

Little information is available on either the extent of, or factors related to, doctoral attrition. This

paucity of data particularly holds concerning attrition at the ABD level. Information which is available consists primarily of estimated figures and general impressions.

Berelson [9] has estimated the number of ABD's to exceed 10,000. Chase [15:31] concluded that a reasonable "rock bottom" estimate for all graduate schools in the Nation for 1959-1960, would be approximately 4,500. However, Chase [15:30] emphasizes that the ABD's were defined in restricted terms in order to arrive at the "rock bottom" estimate. His definition of ABD's included those doctoral candidates who had completed all formal course requirements at least three years prior to the study, whom the graduate deans would be willing to recommend for a one-year fellowship to complete the dissertation.

A major study by Tucker et al. [31] provides some interesting data concerning ABD's. Tucker's study, claimed to be one of the first serious studies of attrition on a national basis [31:Foreword], included information on approximately 23,000 post-master students for whom data was obtained from 24 universities. The study was restricted to the fields of Biosciences, Physical Sciences, Social Sciences and Humanities. Despite the exclusion of the field of Education, Tucker's results are relevant to this study. According to Tucker et al. [31:64], attrition of post-master students ranged

from 14 per cent to 67 per cent with an average of 38 per cent. Of these drop-outs, 20 per cent had completed all but the dissertation [31:67].

Overall attrition rate at the ABD level was reported as 8 per cent. This figure is below what might be expected. However, it should be noted that Tucker defined ABD's as individuals who were enrolled for doctoral work between 1950 and 1953 and had completed all requirements but the dissertation by 1962. This time period not only spans twelve years, but, in addition, 23 per cent of the persons Tucker identified as ABD's began their post-master study prior to 1949. Therefore, the time lapse between initiation of post-master study and the ABD stage could range from fourteen years upward for these people. If the ABD's had been defined in terms of a time lapse which more nearly corresponds to the program requirements (e.g., as those candidates who had not graduated within three years of completing all requirements but the dissertation) the attrition rate at the ABD level may have been different. In other words, reported attrition rates of ABD's can vary according to the definition of an ABD.

Among Tucker's findings was that attrition rate was <u>lower</u> for students who:

1. were male [31:57];
2. attended high quality schools [31:67];
3. majored in the sciences [31:67];

4. did all of their doctoral work at one university [31:131];

5. took doctoral work in the same area of study as at the bachelor's or master's level [31:133];

6. decided before or during high school that they would enter Ph.D. programs [31:133];

7. were definitely committed to a specific field of study at entrance into the doctoral program [31:133];

8. knew a large proportion of the faculty [31:202];

9. received encouraging advice from a faculty member [31:202];

10. had enough money for necessary expenses [31:229];

11. held assistantships [31:229];

12. considered doctoral study an excellent investment [31:229];

13. are Caucasian [31:246];

14. are Jewish or indicated no religious background [31:246];

15. had either no children or one child [31:247].

In interpreting his data, Tucker et al. [31:292] stated as a major conclusion that "it appears that most of the students who dropped out of Ph.D. programs did not complete the requirements for the degree mainly because they lacked sufficient motivation".

Some differences between the findings of Tucker and Berelson should be noted. In Berelson's [9:169] survey, the two most frequent reasons for attrition cited by graduate deans, graduate faculty and recent recipients of the doctorate were lack of finances and lack in intellictual ability. Yet Tucker [31:279]

reported that some individuals having less ability than what might be considered necessary for Ph.D. students "can and do complete requirements for the doctorate if they are strongly motivated".

Tucker's findings on finances also differ from expectations. Less than 20 per cent of drop-out respondents in Tucker's study indicated that lack of adequate finances was the main reason for their attrition [31:229].

As mentioned earlier, the ABD problem is particularly widespread in the field of Education. Chase [15:31] surveyed 139 doctorate-granting institutions and found that Education has the largest number of ABD's reported in any one of over 60 fields. The 664 ABD's in Education, reported by 57 universities having ABD's, comprised 16.5 per cent of the total ABD's for the academic year 1959-1960. Berelson [10:130] concludes that because only 40 per cent of dissertations in Education are completely done at the university, the field of Education has a much more serious problem with ABD's than is the case in the Arts and Sciences.

Thus, although there is some evidence of factors which are related to attrition of doctoral candidates, relatively little is known about factors associated with attrition at the ABD level. There is, however, general concensus that: (1) there is a substantial number of

ABD's and (2) the number of ABD's is greater in the field of Education than in other fields.

The Role of Academic Achievement

What little information is available on the relationship of academic achievement to attrition of doctoral candidates and duration of doctoral study is somewhat contradictory. In Berelson's survey [9:169], one of the most frequent reasons given for attrition was lack in intellectual ability. Yet, Tucker et al. [31:206] found that 60 per cent of those admitted to graduate study with undergraduate grade point averages of less than 3.0 were able to complete the requirements for a Ph.D. degree.

Tucker [31:278] adds that although undergraduate grade point average appears to be a fairly good predictor of the ability of a doctoral student to obtain satisfactory grades for graduate course work, it is not as good a predictor as to whether a student will successfully complete the research requirement of a Ph.D. program. He concludes [31:210] that Ph.D. level grade point average is a better indicator than master's or bachelor's grade point average of a student's potential for completing requirements for a Ph.D. degree.

Wilson [35:146] feels that not controlling for "functional abilities" associated with performance in

Ph.D. programs complicated his interpretation of observed differences between faster and slower duration groups. He adds that little is known about the correlates of "successful performance" in Ph.D. study.

The Role of the Dissertation

The dissertation requirement for the doctorate is undoubtedly one important factor in both attrition of doctoral candidates and extended duration of doctoral study. For example, Tucker [31:278] found that only a few of the drop-outs reported that one of the main reasons for their attrition was unsatisfactory grades. A considerably larger number reported that the research requirement was one of the main reasons for their attrition.

Results of Wilson's [35] study indicate concern of both recent graduates and graduate faculty about the role of the dissertation requirement in duration of doctoral study. Twenty-five per cent of 1,226 recent doctoral graduates who offered suggestions for time-reduction of the doctoral program, suggested modifications relating to the dissertation [35:155]. In addition, graduate deans and faculty members ranked variables related to the dissertation second only to continuity of study as a factor which increases the duration of doctoral programs [35:43].

It appears then, that the dissertation is viewed not only as a lengthening factor in duration of doctoral study but also as a factor involved in dropping out at the ABD level.

Amount of Research Preparation

Reports from graduate faculty, recent recipients of the doctorate and drop-outs of the doctoral program seem to indicate that the amount of research preparation a candidate receives is related to both duration and attrition of doctoral candidates. As an example, 55 per cent of the 4,747 Ph.D. graduates and drop-outs whom Tucker [31:163] surveyed, considered valid the criticism that their department "didn't provide enough training for research and scholarly activities". Tucker et al. [31:175] consequently found that attrition rates were higher among those who felt that their department did not provide enough training for research and scholarly activities than among those who felt that it did.

Also supporting the need for adequate research preparation were the modifications relating to the dissertation suggested by doctoral graduates in Wilson's [35] study. These suggestions included: (1) better preparation for research and (2) that training in research techniques be initiated earlier. Graduate deans and faculty in Wilson's [35:44] study also indicated the

importance of research preparation when they suggested prior experience in research as an "important" variable related to the dissertation and duration of doctoral study.

Effective Research Communication

In the late 1950's, the American Institute for Research initiated a series of studies dealing with the evaluation and measurement of research performance. The expressed objective of this project was to evaluate research through the report.

In the first publication of this series of studies [5], the importance of the research report as a means of effective communication among research workers is emphasized and the following remarks are stated [5:1]:

> Effective communication among research workers is an essential and time honored aspect of research. It is therefore surprising that the effectiveness of this communication, that is, the amount of information conveyed* to different readers by scientific reports, has not been investigated.
>
> Such an assessment should provide valuable knowledge concerning the effectiveness with which written reports communicate to research workers. For an important function of scientific report writing is to communicate to the qualified reader the contribution which has been made by the reported research.

According to the AIR report [5] an additional advantage of examining a written research report is that it provides a means of evaluating the product. Many

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*Underlining is added

persons specializing in evaluation feel that the product is the most important factor to use in evaluation of educational processes. For example, Sorenson [28:3] states that the proper way to evaluate the educational process is to find out whether they are in fact producing the hoped-for product. According to Tyler [32:410-412], it is more important to evaluate the product than the process.

The primary problem in evaluation of an unique product such as the dissertation is that any two or more evaluators are likely to disagree about the purpose of the task and thus disagree about the "goodness" of the product. A relevant example of disagreement between evaluators occurred when the AIR used evaluators to rate dissertations, and a "consistently small amount of agreement between two independent evaluations of a given piece of research through the report" was found [5:39]. However, it was emphasized that, despite the poor agreement between raters, evaluation of research through the report is an important problem which needs careful attention [5:40].

Evaluation of the dissertation is a discouraging task for at least three reasons: (1) there are few communalities among dissertations, (2) there is too little agreement among evaluators and (3) it requires a considerable amount of time to evaluate dissertations which can vary from 40 to over 500 pages. Since these

difficulties in evaluating the dissertation usually exist to some degree, there is some question about the utility, particularly when viewed in terms of time and cost factors, of evaluating the dissertation itself. Yet, some measure of the research performance of the doctoral candidate is desirable.

The Dissertation Abstract

One bit of communication which is common to all dissertations is the abstract. To a degree, the abstract of the dissertation can be likened to a journal article since both must contain a maximum amount of information in limited space. (It is interesting to note that, according to Berelson [9:183], a growing number of faculty members advocate a dissertation of journal-article length.) Although a journal article is usually more detailed than an abstract, the purpose of both is to communicate information to the reader. In Guide to a Graduate Degree [24], theses abstracts are discussed as follows:

> The major purpose of the abstract is to give information which will enable the scholar to decide whether he wishes to read the complete work. The following information is generally included:
>
> (a) A brief statement of the problem
>
> (b) A description of the methods, techniques, and data used
>
> (c) The major findings of the study
>
> The nature of these portions of the abstract would vary with the type of project reported and in some cases might take quite different form. In general,

however, useful abstracts will contain these three types of information.

There are many advantages to using the dissertation abstract to evaluate research communication. The major advantage is that the abstract is a piece of the doctoral candidate's work. The candidate writes it as a summary of what the dissertation supposedly contains. Therefore, it is a product of the doctoral candidate which is amenable to measurement and evaluation by others.

In addition, the abstract has the four advantages mentioned in the AIR report [5:3]:

> The Report:
>
> 1. Is a permanent record of performance;
> 2. Can be made available to several judges or raters;
> 3. Can be evaluated by persons who do not know the author, thus decreasing personal bias;
> 4. Can be evaluated in a single and relatively brief period, rather than requiring a series of observations of job performance.

The AIR studies indicate that: (1) communication of research through the report is an important aspect of the research process, (2) the effectiveness of this communication can be measured by the amount of information conveyed, and (3) the research report can be used to evaluate research performance. Prompted by these implications, in this study the amount of research information communicated in the dissertation abstract

will be used as a measure of effective research communication of the doctoral graduate.

Methodology

One of the reasons that universities sometimes lag in research concerning their own processes and products is that, at times, considerable resistance to such research exists. This resistance can occur not only within the university setting itself but also from outside of the institution from individuals who are concerned with university policies and procedures. Factors which create resistance to institutional research and evaluation have been identified as cost [13:288, 27:1019], confidentiality of material [17:426], fear of "no-difference" outcomes [13:289], social effects of the research activity itself [27:1019] and political vulnerability [13:288].

Institutional Records

Means of coping with resistance based on cost or social effects have been considered by Campbell [13] in making the following recommendations: (1) make use of existing institutional records, (2) incorporate new measures into institutional records and (3) keep records on all kinds of institutional experimentation.

In discussing these points, Campbell [13:260-262] emphasizes that records are nonreactive measures which

do not intrude upon the situation and thus alleviate the problems connected with the artificiality of the laboratory situation. The use of nonreactive or unobtrusive measures also rescues the researcher from charges of harmful effects upon the subjects.

Unobtrusive measures are also advocated by Webb et al. [34:vii] who point out that use of such measures can provide relevant data without identifying individuals and without manipulating them in any way. These authors also note the generally lower cost of data collection of nonreactive measures as compared with other types of data collection methods [34:180].

Additional advantages of using nonreactive measures and institutional records are: optimal generalizability [13:291,33:173], control of error due to the act of measurement [34:175], and the possible opportunity to expand the usual trivial research base to larger groups of people and wider settings [13:258].

Disadvantages of using institutional records occur when records are: (1) inaccurate, (2) inaccesible, (3) out-of-date or (4) nonexistent. As with all documents, the possibility of selective deposit and selective retention exists. Thus universities, as well as other institutions, should attempt to keep their records accurate, accessible, updated and as comprehensive as feasible.

Content Analysis

One useful, but often overlooked, form of unobtrusive measures is content analysis. In recent years content analysts have attempted to overcome the reputation of their research technique as an unsophisticated, descriptive, counting procedure by emphasizing that content analysis studies should include not only information on content but also information about the kinds of people who are communicating and their environments [12:ix]. Several authors [12:3,30:237-239], agree that the purpose of content analysis studies is to make inferences from content to its antecedents or sources, or from content to its receivers or effects.

There is also agreement that content analysis is most useful when it is used in conjunction with other research methods and includes information on variables other than those derived from content. Webb et al. [34:1] object to the use of interviews and questionnaires as the sole measurement of variables and recommend that these research techniques be supplemented by unobtrusive measures of the same variables. Budd et al. [12:4] point out that because the analyst is concerned with the process and effects of communication, he should make use of additional information (attitude, personality, demographic characteristics) in order to make better

predictions about the relationships among the source, the receiver and the content and adds that "in such studies content analysis is considered a tool to be used in combination with other techniques".

To summarize, the research technique of content analysis can be useful in the following ways: (1) to describe occurrences or nonoccurrences of selected variables, (2) to predict relationships among source, receiver and content, and (3) as an adjunctive tool to supplement and cross-validate measures obtained by a different method.

Content Analysis of Institutional Records

Institutional records of colleges and universities are a rich source for content analysis studies because they usually include: (1) demographic and bibliographic data of students and faculty, (2) measures of personality, aptitude, etc., (3) measures of academic performance and achievement, and (4) products of student and faculty work. In addition, institutional records could include measures of aspirations, motivations, morale or any measure considered sufficiently informative or valuable to warrant the cost involved in obtaining it and incorporating it into the records. Dressel [17:410] notes that certain data (e.g., sex, age, indices of ability, socio-economic status, etc.) should be collected continually on all

students. If there is a generally recognized need to include other variables, cost would probably not be a decisive factor.

Not only can a variety of data be extracted from institutional records but also treatment of the data can vary. Procedures range from the relatively simple recording of information, for which time and cost factors are minimal, to the more complex task of attempting to measure psychological constructs through analysis of content. Although the latter procedure is usually higher in cost and consumption of time, it is more likely to reveal findings of greater import to general knowledge, while the specific findings of the former are likely to be of more interest to those individuals involved in practical, day-to-day decision making.

There is no attempt here to advocate either end of this procedural continuum because each tends to serve the different, but complementary, functions mentioned above. Osgood [25:37] stresses this compatibility of approaches when he states "just as the validation of many specific inferences by practically oriented users may provide insights into general relations, so the gradually accumulating generalities of the academician may enrich the base for the practical content analyst". He also mentions the ideal situation of the "tool

makers" and the "tool users" working in close association.

On the other hand, when Campbell [13:267] discusses the problems of extrapolation of findings he emphasizes that we cannot wait for dependable generalizations to be developed because need exists now for cumulative processes where each situation is evaluated.

Prompted by Campbell's position, and recognizing that analysis of the loosely structured process of doctoral study does not lend itself to "dependable generalizations", the cumulative approach is taken for this study. That is, in this study, attrition and duration of doctoral candidates in a College of Education, and factors which are posited to be related, will be investigated in order to add to the cumulative knowledge of these problems. The methodology of this research will include making use of institutional records in a content analysis framework.

Hopefully an additional outcome of the study might be to demonstrate that: (1) it is possible and practical for decision makers to have empirical evidence--of whatever kind they deem valuable--upon which to help base decisions and (2) a variety of questions can be answered from the relatively inexpensive research procedures which make use of institutional records in a content analysis framework.

Summary

1. Duration of doctoral study, in terms of the B.A.-Ph.D. time lapse median of 13.8 years, is higher in Education than in any other field.

2. The M.A.-Ph.D. time lapse median of 8.4 years in Education is far from the ideal time of three to four years.

3. The number of ABD's is higher in Education than in any other field.

4. Lack of motivation is considered a major factor in attrition of doctoral candidates.

5. Evidence about the relationship of academic achievement to duration and attrition of doctoral candidates is scanty and somewhat contradictory.

6. Graduate faculty, recent graduates and ABD's cite the research requirement for the dissertation as a major cause of both extended duration and attrition.

7. Graduate faculty, recent graduates and ABD's express concern about the lack of research preparation for the dissertation.

8. Communication of research through the research report is an important aspect of the research process and an expected research-related duty.

9. For this study, the amount of research information communicated in the dissertation abstract is considered a measure of effective research communication.

10. The use of institutional records in a content analysis framework is a practical and unobtrusive method of obtaining empirical evidence.

CHAPTER III

THEORY AND OBJECTIVES

Amount of Research Preparation

The review of research indicates that the dissertation process is considered a major cause of extended duration of doctoral study and attrition of doctoral candidates. It is inferred from this conclusion and from the research findings discussed that the amount of research preparation a doctoral candidate receives is associated with: (1) duration of doctoral study, (2) attrition at the ABD level and (3) effective research communication of the doctoral candidate.

These relationships are more readily understood if we examine some variables posited to be intervening between the research preparation period and the performance outcomes.

Intervening Variables

Task Familiarity

Most research preparation courses require student involvement in research tasks such as measurement and analysis of data, or conducting, reporting or proposing a research study. From one learning theory viewpoint

reported by Craig [16:21], an individual learns what he does. Therefore, the doctoral candidate who has learned to apply theoretical and methodological aspects of research should have some degree of familiarity with research tasks. Since he is prepared for and familiar with the tasks, he should perceive the research process as less difficult.

Task Difficulty

Atkinson [7] reports that tasks of moderate difficulty are more likely to evoke achievement orientation and the desire to do well than are tasks which are extremely difficult or extremely easy. It is doubtful that any doctoral candidate views the dissertation process as an extremely easy task. Thus, the doctoral candidate who is well prepared for the dissertation task should look upon the task as moderately difficult, rather than extremely difficult, and consequently should desire to do well at and be oriented to achieve the dissertation task.

On the other hand, doctoral candidates who perceive the dissertation task as extremely difficult would not be as likely to achieve or do as well as doctoral candidates for whom the task is moderately difficult.

Task-Created Dissonance

According to theories of cognitive consistency, an individual will continually strive toward consistency or

balance. That is, if there are inconsistencies among a person's cognitions, he will try to restore balance by changing one cognition for another [22:8].

Although it is generally agreed that most people can tolerate some dissonance, it is the proposition of balance theorists that the reduction of dissonance is reinforcing to the individual. Dissonance reduction is viewed much the same as any other drive reduction (e.g., it is reinforcing to reduce pain).

When dissonance is aroused, there are several hypothesized alternative responses to reduce the dissonance. According to McGuire [22:10], these reduction modes are not necessarily mutually exclusive. Some of the reduction modes are believed to be [22:10-14]:

1. repression (put out of mind);
2. devaluating the task;
3. submergence (submerging the inconsistency among a larger body of consistencies);
4. redefinition of the object (rather than changing opinion about the object, the object itself is redefined);
5. changing opinion about the object;
6. changing the object.

In addition to reducing dissonance via some reduction mode, another response to inconsistency is toleration and continuance of the dissonance.

As McGuire [22:13] points out, these many alternative reduction modes make it extremely difficult

for the researcher to predict which mode an individual will use to reduce dissonance, particularly since it is assumed that people have differing levels of dissonance. However, cognitive dissonance theory does posit that the greater the amount of dissonance aroused, the more likely it is that the individual will use some mode of dissonance reduction.

Therefore, doctoral candidates who are inadequately prepared for the dissertation task would be likely to experience some level of task-created dissonance and consequently, would be likely to either: (1) use one of the modes of dissonance reduction and complete the dissertation, in differing amounts of time and at differing performance levels or (2) tolerate the inconsistency and do little or nothing about completing the dissertation.

The doctoral candidate who is better prepared for the dissertation task could also either use one of the modes of dissonance reduction or tolerate the inconsistency and do nothing about the dissertation. However, because it is assumed that the better prepared candidate would experience a moderate rather than an extreme amount of dissonance about the task, it seems tenable that he would be more likely to: (1) complete the dissertation, (2) complete it within an optimum time span and (3) perform well on it.

Task Motivation

One of the major conclusions of Tucker's study [31:292] was that motivation was an important factor in attrition of doctoral candidates. This conclusion appears tenable when we consider that: (1) the dissertation is a major factor in both attrition and extended duration, (2) the dissertation undoubtedly creates some level of dissonance in doctoral candidates and (3) the level of dissonance is related to the degree of motivation.

There is some disagreement among authors such as Festinger [19:3], Brehm and Cohen [11:228-231] and Pepitone [26:273] about the complex interaction of dissonance and motivation. However, there is general agreement that the arousal of dissonance and the dissonance reduction process has motivational aspects. Furthermore, Feldman [18:87] implies that the greater the motivation, the more permanent the effect on evaluation of an element.

Thus, it is posited that the more-prepared candidate, for whom the task is familiar and not difficult, will experience a moderate, rather than an extreme, amount of dissonance about the dissertation task and will likely be motivated to achieve and perform well on the task. This position is also supported by Craig [16:56] who reports that motivation

is aroused by slight to moderate variations of familiar situations, but not by difficult situations.

A General Model for Studying Doctoral Performance

In order that the relationships among the several variables discussed can be more readily visualized, a general model for studying doctoral performance is presented in Figure 1. When the variables discussed previously are incorporated into the general model, the following relationships are assumed to hold:

1. the greater the amount of research preparation, the greater the degree of research familiarity;
2. the greater the amount of research familiarity, the less the dissertation task will be perceived as difficult;
3. the less difficult the dissertation task is perceived, the less dissonance the dissertation task will create;
4. the less dissonance produced by the dissertation task, the higher the motivation to accomplish the task;
5. the higher the motivation to accomplish the task, the better will be the performance. That is: (1) the more likely it is that the doctoral candidate will complete the dissertation and consequently the degree, (2) the shorter will be the elapsed time for completion of doctoral study and (3) the more effective the research communication will be.

For the purposes of this study, the individual's dispositions (task familiarity, task difficulty, dissonance and motivation) will be considered as intervening variables. Thus, the model specific to this study is presented in Figure 2.

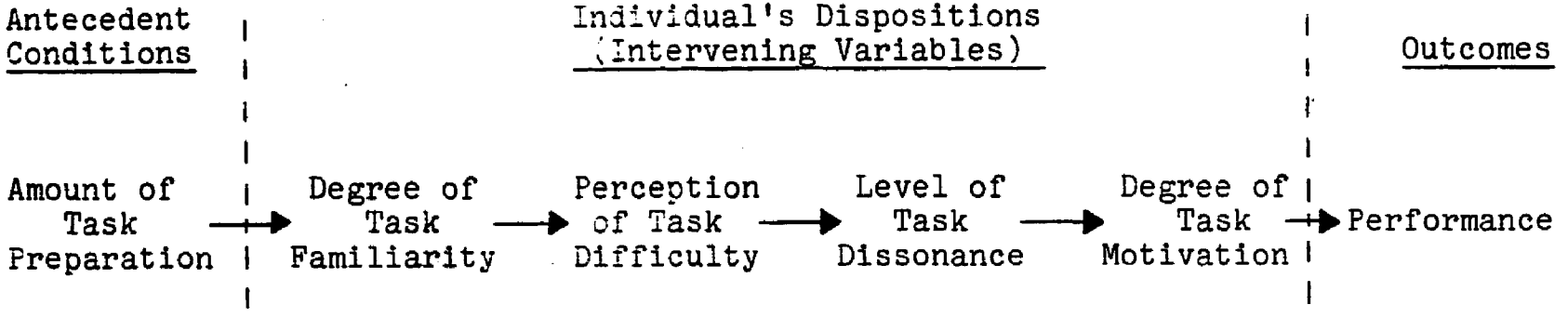

Fig. 1.--A general model for studying doctoral performance.

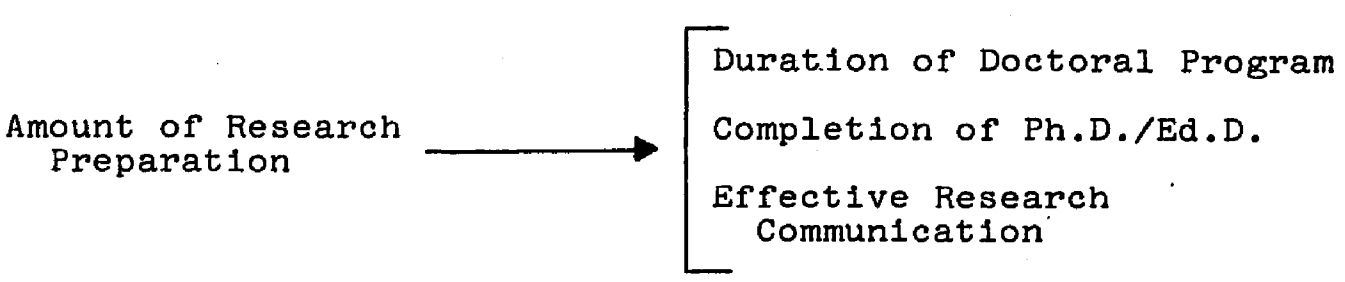

Fig. 2.--A specific model for studying doctoral performance.

Hypotheses

The hypotheses to be tested in this study are derived from both the theoretical and established relationships among relevant variables previously discussed and illustrated in the models.

H_1: The greater the amount of research preparation completed by doctoral graduates during their doctoral program:

a. the shorter will be the duration of the doctoral program;

b. the more effective will be the research communication.

H_2: For doctoral graduates, effective research communication and duration of the doctoral program are related to the amount of research preparation completed during the doctoral program as follows:

	Effective Research Communication	
Elapsed Time Admission - Ph.D.	Above Average	Below Average
Shorter (Below Average)	Group 1	Group 3
Extended (Above Average)	Group 2	Group 4

Group 1 > Group 2 > Group 3 > Group 4 on amount of research preparation completed during the doctoral program.

H_3: Doctoral candidates who do not complete the dissertation and consequently the degree (ABD'S) will have completed less research preparation during their doctoral program than doctoral graduates.

Groups 1, 2, 3, 4 > Group 5 on amount of research preparation.

For hypotheses two and three, it is posited that the doctoral candidate who is well prepared for the dissertation task will experience moderate dissonance about a familiar task and, therefore, will be motivated not only to complete the task but to perform well. Therefore, the well prepared doctoral candidate would be likely to be in:

Group 1: Doctoral graduates who have completed the doctoral program in a shorter amount of elapsed time and who indicate more effective research communication.

On the other hand, the doctoral candidate who is inadequately prepared for the dissertation task should experience more than moderate dissonance and would tend to either use some mode of dissonance reduction or tolerate and continue the dissonance. Thus, the inadequately prepared doctoral candidate would likely belong to one of the following groups:

Group 2: Doctoral graduates who may have prolonged the time period while acquiring more research preparation, resulting in extended elapsed time and more effective research communication.

Group 3: Doctoral graduates who may have proceeded with the research despite inadequate preparation, resulting in a shorter amount of elapsed time and less effective research communication.

Group 4: Doctoral graduates who may have delayed the dissertation task unnecessarily long but did not prepare further in research, resulting in extended elapsed time and less effective research communication.

Group 5: Doctoral candidates (ABD's) who avoid the dissertation task by leaving the institution without the dissertation and consequently the degree.

In addition to the hypotheses stated above, the following exploratory questions will be investigated.

Exploratory Questions

I. To what degree are (a) duration of the doctoral program, (b) effective research communication and (c) completion of the doctoral program associated with:

1. sex;
2. departmental affiliation;
3. kind of degree (Ph.D. or Ed.D.);
4. assistantship held during the doctoral program;
5. junior-senior undergraduate grade point average;
6. doctoral grade point average;
7. age at admission to doctoral course work;
8. score on the Miller Analogies Test.

II. What is the average number of courses completed in each kind of research preparation course (theory, research methods, measurement, statistics)?

III. Does the amount of research preparation received differ among cognate areas completed during the doctoral program?

IV. Is undergraduate major related to effective research communication?

V. Does duration of the doctoral program vary by major area within departments?

Operational Definitions

1. Doctoral Graduates: All doctoral candidates who: (1) completed their doctoral program in the College of Education, Michigan State University, (2) transferred no more than nine credit hours from another institution, (3) completed comprehensive examinations within the two year period from Fall term 1963 through Summer term, 1965 and (4) graduated by the end of Summer term 1968.

2. ABD's (All But Dissertations): All doctoral candidates who: (1) took their doctoral program in the College of Education, Michigan State University, (2) transferred no more than nine credit hours from another institution, (3) completed comprehensive examinations within the two year period from Fall term 1963 through Summer term 1965 and (4) did not graduate by the end of Summer term 1968, thus exceeding the university required time limit of completing the Ph.D. within three years of completing comprehensive examinations.

3. Effective Research Communication: Total score on the Research Information Index (see Appendix I) which is used to measure the amount of research information communicated in the dissertation abstract. The higher the score on the RII, the more effective is the research communication.
4. Duration of the Doctoral Program: Elapsed time in number of terms from admission to (first enrollment in) doctoral course work to completion of the doctoral degree.
5. Amount of Research Preparation: Total number of credit hours for all university courses identified by faculty members as research preparation courses.
6. Research Preparation Courses: Courses which are: (1) listed in the university catalogues, (2) identified by faculty members for their own department or college and (3) offered primarily to prepare candidates to apply theoretical and/or methodological aspects of research (see Appendix II).
7. Kind of Research Preparation: Four categories of research preparation courses to which faculty members assigned courses identified as primarily preparing students to apply theoretical and/or methodological aspects of research. The four categories are: (1) theory, theory construction or logic, (2) research methods, (3) measurement or evaluation, and (4) statistics or mathematics.

8. Kind of Degree: The degree, Doctor of Education (Ed.D) or Doctor of Philosophy (Ph.D.) which: (1) the candidate has received or expected to receive and (2) is listed on the university record.
9. Departmental Affiliation: One of four departments within the College of Education. The four departments are: (1) Elementary and Special Education, (2) Secondary Education and Curriculum, (3) Administration and Higher Education and (4) Counseling, Personnel Services and Educational Psychology.
10. Major Area: The major within the department of the College of Education. A list of major areas is in Appendix III.
11. Cognate Area: The discipline outside of the field of Education (e.g., Psychology, Sociology, Communication) which has been selected by the candidate and listed on the university records as the cognate area.
12. Doctoral GPA: University recorded grade point average for all courses completed during the doctoral program.
13. Junior-Senior GPA: University recorded grade point average for courses completed during the junior-senior years of undergraduate school.

14. Score on the MAT: Raw score on the Miller Analogies Test taken by the doctoral candidate after completing undergraduate school.

15. Assistantship: Position in the College of Education held by the doctoral candidate while completing his doctoral program. This category includes the titles of graduate assistant and assistant instructor.

16. Undergraduate Major: The doctoral candidate's recorded undergraduate major categorized into one of three areas: (1) behavioral sciences, (2) physical sciences and (3) other (see Appendix IV).

CHAPTER IV

PROCEDURES

The Population

The population selected for this study included all doctoral candidates who:

1. took their doctoral program at the College of Education, Michigan State University;
2. transferred no more than nine credit hours from another institution;
3. were enrolled in one of the following four departments in the College of Education: (1) Elementary and Special Education, (2) Secondary Education and Curriculum, (3) Administration and Higher Education and (4) Counseling, Personnel Services and Educational Psychology;
4. completed comprehensive examinations in the two year period from Fall term 1963 through Summer term 1965.

Candidates who met the above criteria and received their degree by the end of Summer term 1968 are termed Graduates. Candidates who had not graduated by the end of Summer term 1968 exceeded the university required time limit of completion of the degree within three years of completing comprehensive examinations, and thus are considered ABD's.

The selection criteria excluded doctoral candidates who transferred to the College of Education from another

institution during their doctoral program. Because of their small number, doctoral candidates from the department of Health, Physical Education and Recreation, a fifth department within the College of Education, were also excluded.

It should be noted that completion of comprehensive examinations indicates that the doctoral candidate has completed: (1) 80 per cent of his course work and (2) the language requirement or the language substitute.

Size of the Population

Two hundred and thirty-nine doctoral candidates completed comprehensive exams from Fall term 1963 through Summer term 1965. Six candidates were excluded because they were enrolled in the Department of HPER. Twenty seven graduates and two ABD's were excluded because they had transferred more than 9 credit hours from another institution. The 204 doctoral candidates remaining in the study included 180 graduates and 24 ABD's.

Data and Instrumentation

Data were gathered from two kinds of institutional records: (1) university records of the doctoral candidate's graduate work and (2) the dissertation abstract.

Records of Graduate Work

Demographic and institutional data were collected from university records for each subject included in the research. The following variables were recorded or computed from these data:

1. total number of research preparation courses completed during the doctoral program;
2. total number of credit hours in research preparation courses;
3. number and credit hours by kind of research preparation course (see Appendix II);
4. sex;
5. departmental affiliation;
6. major area within the department;
7. cognate area;
8. age at admission to doctoral course work;
9. age at graduation;
10. kind of degree (Ed.D. or Ph.D.);
11. undergraduate major;
12. total number of credits completed for the doctoral program;
13. doctoral GPA;
14. junior-senior GPA;
15. raw score on the Miller Analogies Test;
16. assistantship held;
17. elapsed time measures;
18. extended duration indices;
19. ideal duration indices.

Elapsed Time Measures

In order to determine average duration for different time periods of post-bachelor's education, the following elapsed time measures were computed:

1. number of years from B.A. to M.A.
2. number of years from M.A. to admission to doctoral course work
3. number of terms from admission to completion of course work
4. number of terms from course work to completion of comprehensive exams.
5. number of terms from comprehensives to completion of oral exams.
6. number of terms from orals to completion of the Ph.D.
7. number of years from B.A. to Ph.D.
8. number of years from M.A. to Ph.D.
9. number of terms from admission to Ph.D.
10. number of terms from completion of course work to Ph.D.
11. number of terms from completion of comprehensive exams to Ph.D.
12. number of terms from admission to completion of comprehensive exams.

Extended Duration Indices

Michigan State University has specified time criteria for completion of different stages of the doctoral program. These time criteria are: (1) completion of comprehensive exams within 5 years after first enrollment in courses counted toward the doctorate, (2) completion of the Ph.D. within 3 years after completion of comprehensive exams and (3) completion of the Ph.D. within 8 years after first enrollment in doctoral course work.

In order to determine to what degree these criteria are met, information was recorded on the number of doctoral candidates who extended:

1. admission to comprehensive exams over 5 years;
2. comprehansive exams to Ph.D. over 3 years;
3. admission to Ph.D. over 8 years.

Ideal Duration Indices

As mentioned previously, the three or four year time lapse from B.A. to Ph.D. considered ideal is far from the actual time lapse. Thus, in order to obtain an ideal time lapse which is more realistic at this time, medians of different elapsed time measures were used as cut-off points to indicate ideal duration. For doctoral candidates in this study, median elapsed times were approximately 4 years from admission to comprehensive exams, 1 year from comprehensive exams to Ph.D. and 5 years from admission to Ph.D.

Thus, in order to explore correlates of ideal duration indices, information was obtained on the number of doctoral candidates who completed:

1. admission to comprehensive exams in 4 years or less;
2. comprehensive exams to Ph.D. in 1 year or less;
3. admission to Ph.D. in 5 years or less.

Kind of Research Preparation Courses

In order to determine the kind of research preparation courses a candidate completes, courses which prepare candidates to apply theoretical and/or methodological aspects of research were originally

assigned to six categories by faculty members from each of four academic areas. The six categories are: (1) theory, theory construction or logic, (2) research methods, (3) measurement and/or evaluation, (4) statistics and/or mathematics, (5) computer applications and (6) research design.

Because the computer applications and research design categories contained only one course each, these two categories were eliminated. The course categorized as computer applications was collapsed into research methods and the course categorized as research design was collapsed into statistics. Thus, the categories used for the study are: (1) theory, theory construction or logic, (2) research methods, (3) measurement or evaluation and (4) statistics or mathematics.

The four academic areas for which faculty members categorized courses are: (1) Education, (2) Psychology, (3) Sociology and (4) Communication. Two faculty members from each of these four areas were asked to assign "research" courses to the six categories. Agreement was not reached for six courses of the ninety three categorized for Education and five courses of the forty seven categorized for Psychology. Therefore, a third faculty member in each of these two areas was asked to categorize those courses about which there was disagreement. The courses were then assigned to the category selected by two of the three faculty members.

All courses completed under the departments of Mathematics and Statistics were considered research preparation courses and categorized under statistics/ mathematics. Courses from departments other than the four mentioned above were categorized by the writer via course descriptions in the catalogues. The instructions concerning procedures followed in categorizing courses can be found in Appendix II.

The Dissertation Abstract

The dissertation abstract of each doctoral graduate selected for the study was scored on the Research Information Index in order to measure effective research communication of the doctoral graduate.

The Research Information Index

The Research Information Index is an instrument developed by the author for the purpose of measuring the amount of research information communicated in a research report.

The three main categories of the RII; The Research Problem, The Research Procedures and The Research Findings, were formed on the premise that information in the research report should usually include: (1) a brief statement of the problem, (2) a description of the methods, techniques and data used and (3) the major findings of the study. Conclusions (recommendations,

discussion, implications), usually included in research reports are omitted from the RII because of their subjective nature.

An underlying assumption of the RII is that the bits of information listed above are basic to all research communication, regardless of the type of research conducted. As Budd et al. [12:46] emphasize, what is not included is often more important to understanding the research than what is included. Therefore, the research report is scored on: (1) the presence of information which is considered essential to understanding the research and (2) the objectivity and specificity of the information.

As indicated in the explanation of the RII (see Appendix I), each item of information considered essential for effective research communication is scored one if present in the report and zero if absent from the report. For example, presence of a statement of the purpose of the research would be scored one and absence of such a statement would be scored zero. In addition, a score of one is given for information which is objective and specific and a score of zero given if it is not objective and specific. Total score can range from zero to 16 points. The higher the score, the more research information is communicated.

In a small pilot study conducted by the author (29), score on the RII discriminated among dissertations abstracts of 12 doctoral graduates. Results of the analysis indicated that the higher the score on the RII, the more likely it is that the doctoral graduate: (1) completed a greater number of research courses and (2) completed his doctoral program in a shorter amount of elapsed time. However, the results of this study must be viewed with caution because: (1) the sample was convenient rather than random, (2) the number of abstracts scored was small and (3) there were no reliability or validity indices.

Interrater Reliability

Prior to data collection in the major study, a random sample of twenty doctoral candidates who were not included in the population were selected and their dissertation abstracts were scored on the RII by two raters working independently. The interrater reliability coefficient, a Pearson Product-Moment correlation of .92, was sufficiently high to warrant use of the instrument on the basis of reliability. The raw scores from which the reliability index was computed are given in Appendix V.

In order to decrease personal bias, a rater who did not personally know the doctoral candidates was selected to score the abstracts for the study. During the data collection period, a random sample of twenty doctoral

candidates included in the study was selected for a check on the interrater reliability. The Pearson Product-Moment correlation was .87, again a high index of interrater reliability. The raw scores from which the reliability index was computed are shown in Appendix V.

Validity

The jury method of validation, considered slightly superior to logical validation [12:69], was used to validate the RII. Five experts in the theoretical and methodological applications of research agreed that the RII appeared to be a valid measure of the amount of research information communicated in the dissertation abstract.

CHAPTER V

FINDINGS

The hypotheses were tested and the data analyzed by computing Pearson Product-Moment correlations, point biserial correlations, analyses of variance and chi squares. The .05 level of significance was preselected as the criterion for rejecting the null hypotheses.

Hypotheses

Hypothesis 1a

Hypothesis 1a states that the greater the amount of research preparation completed by doctoral graduates during their doctoral program, the shorter will be the duration of the doctoral program. To test this hypothesis, a Pearson Product-Moment correlation was computed between the total number of credits in research preparation courses completed by doctoral graduates and the number of terms from admission to graduation. As Table 1 indicates, the correlation of -.21 is significant at less than the .05 level, thus supporting the hypothesis.

TABLE 1.--Correlations of total credits in research preparation with number of terms admission to Ph.D. and total score on RII.

	N	No. Terms Ad.-Ph.D.	p	Total Score RII	p
Total Credits Research Prep.	180	r = -.21	<.005	r = .24	<.005

Hypothesis 1b

Hypothesis 1b states that the greater the amount of research preparation completed by doctoral graduates, the more effective the research communication will be. To test this hypothesis, a Pearson Product-Moment correlation was computed between the total number of credits in research courses completed by doctoral graduates and the total score on the RII. This hypothesis is also supported as the correlation of .24 is significant at less than the .05 level (see Table 1).

Hypothesis 2

For hypothesis 2, doctoral graduates were grouped as follows:

		Effective Research Communication	
		More (≥12 on RII)	Less (<12 on RII)
Elapsed Time Ad.-Ph.D.	Shorter (≤ 5 years)	Group 1	Group 3
	Extended (> 5 years)	Group 2	Group 4

The hypothesis stated that Group 1 > Group 2 > Group 3 > Group 4 on amount of research preparation.

Median elapsed time from admission to Ph.D. was five years (20 terms) and median score on the RII was 12. Results of the analysis of variance, using total number of credits completed in research preparation courses as the score, supported hypothesis 2. Average number of credits completed by each group is shown in Table 2.

As indicated by the standard deviations given in Table 2, Group One, with the greatest amount of research preparation, was the least variable group in number of credits in research preparation, score on the RII and elapsed time from admission to comprehensives.

Hypothesis 3

Hypothesis 3 states that ABD's will have completed less research preparation during their doctoral program than doctoral graduates. As the figures in Table 3 indicate, this hypothesis was not supported by result of the analysis. Average number of credits in research preparation courses completed was 17.52 for graduates and 15.67 for ABD's. The standard deviations indicate that the ABD's varied more than Graduates in the number of credits completed in research preparation courses.

Upon examination of the data, it was found that 29% of the ABD's completed only one or no research preparation courses as compared with 8% of the Graduates.

TABLE 2.--Amount of research preparation by groups based on median elapsed time from admission to Ph.D. and median score on the RII.

Group	Score on RII		Terms El. Time Ad.-Ph.D.		N	Mean Number of Credits Res. Prep.	Standard Deviation
	$\bar{X}$	S.D.	$\bar{X}$	S.D.			
1. More research comm. shorter duration	13.46	1.16	14.30	3.52	54	21.63	8.76
2. More research comm. extended duration	13.77	1.31	31.38	9.12	39	16.41	10.42
3. Less research comm. shorter duration	8.98	1.91	14.45	3.86	42	16.33	10.60
4. Less research comm. extended duration	8.60	2.04	31.82	9.27	45	14.67	9.17
Overall	11.27	2.91	22.42	10.97	180	17.52	10.00

$F_{3,176} = 4.93$, $p = .003$

This post-hoc finding indicates that future exploration of the relationship between number of research preparation courses completed and attrition at the dissertation stage may be fruitful. Distribution of number of research preparation courses completed by graduates and ABD's is reported in Table 4.

TABLE 3.--Amount of research preparation completed by graduates and ABD's.

	N	Mean Number of Credits Res. Prep.	Standard Deviation	F	
Graduates	180	17.52	10.00	.6956	N.S.
ABD's	24	15.67	11.96		

TABLE 4.--Distribution of number of research preparation courses completed by graduates and ABD's.

Number of Research Prep. Courses Completed	Graduates N=180	ABD's N=24
0	4	4
1	10	3
2	20	0
3	19	3
4	16	2
5	24	1
6	18	1
7	23	1
8	15	3
9	11	2
10	8	3
11	8	1
12	2	
13	0	
14	1	
15	1	

Exploratory Questions and Post-Hoc Analysis

Although the relationships among the variables reported in this section were not hypothesized, results of the analyses are suggestive of their existence. That is, if these relationships had been hypothesized, all variables reported here as correlated or related would have shown a significant relationship at less than the .05 level on a two tailed test of significance. Because significance levels are not appropriate here, values, means, or distributions are reported. The purpose of reporting information about these correlates is to suggest that further study of the relationship among these variables is warranted.

Correlates of Admission to Ph.D. Duration

Average elapsed time from admission to Ph.D. for the doctoral graduates was 22.4 terms or approximately 5 1/2 years. In addition to the amount of research preparation, other correlates of elapsed time from admission to Ph.D. are reported in Table 5.

Although the magnitude of the correlations indicates that only a small amount of the variance in elapsed time is accounted for by these variables, the correlations suggest that these relationships exist. That is, the shorter the duration from admission to Ph.D., the more likely it is that the doctoral candidate:

TABLE 5.--Correlates of elapsed time from admission to Ph.D. for graduates.

No. Terms Admission to Ph.D. with:	N	Statistic	Value
Credits Res.	180	r	-.21
Jr. - Sr. GPA	121	r	-.19
Doctoral GPA	180	r	-.22
Total Program Credits	180	r	.15
Ph.D./Ed.D.	180	r_{pb}	.38
No Assist./Assist.	180	r_{pb}	-.31
Undergraduate Major*	170		
	N	$\bar{X}$ terms Ad.-Ph.D.	Standard Deviation
*Behavioral Science	20	17.30	7.75
Physical Science	38	25.39	13.19
Other	112	22.40	10.41

(1) completed more credits in research preparation courses, (2) received a Ph.D. rather than an Ed.D., (3) held an assistantship, (4) received higher grades both during the junior-senior undergraduate years and during the doctoral program, (5) completed fewer total credits for his doctoral program and (6) had an undergraduate major in the behavioral sciences. Age at admission, sex and score on the Miller Analogies test were not related to duration, as shown by the correlations given in Table 22.

Departmental affiliation and major area within department were also related to duration of doctoral study. Average number of terms from admission to Ph.D. for each department and major area are reported in Table 6. In examining Table 6 and other tables reporting figures by major area, it should be noted that means based on a small number of subjects must be interpreted with caution.

TABLE 6.--Elapsed time from admission to Ph.D. by department and major area for graduates.

Department	N	Mean No. Terms Ad.-Ph.D.	Major	N	Mean No. Terms Ad.-Ph.D.
Elementary & Special Educ.	9	23.33	Elementary	5	30.40
			Special	4	14.50
Secondary Ed. & Curriculum	47	22.23	Secondary	2	32.50
			Curriculum	24	21.79
			Soc./Phil.	8	19.75
			Bus./Dist.	5	20.80
			Industrial	2	33.00
			Agriculture	4	19.00
			Home Ec.	2	26.50
Administration and Higher Education	60	25.07	Adult	21	24.76
			Higher	10	20.40
			Admin.	29	26.90
Counseling, Per. Ser. and Educ. Psych.	64	19.94	Couns./P.S.	48	21.44
			Ed. Psych.	7	19.57
			Meas./ Research	9	12.22

Correlates of Effective Research Communication

Average score on the RII was 11.27 of a possible total score of 16 points. In addition to amount of research preparation, score on the RII was related to departmental affiliation and major area within departments. Average scores on the RII for each department and each major area are shown in Table 7.

TABLE 7.--Score on the RII by department and major area for graduates.

Department	N	Mean Score RII	Major	N	Mean Score RII
Elementary & Special Educ.	9	11.44	Elementary	5	11.60
			Special	4	11.25
Secondary Ed. & Curriculum	47	11.36	Secondary	2	14.00
			Curriculum	24	11.67
			Soc./Phil.	8	9.88
			Bus./Dist.	5	12.60
			Industrial	2	13.00
			Agriculture	4	10.50
			Home Ec.	2	8.00
Administration and Higher Education	60	10.08	Adult	21	9.52
			Higher	10	11.60
			Admin.	29.	9.97
Couns. Per. Ser. and Educ. Psych.	64	12.28	Couns./P.S.	48	12.65
			Educ. Psych.	7	11.14
			Meas./ Research	9	11.22

Score on the Miller Analogies Test, kind of degree, assistantship held, junior-senior undergraduate and doctoral GPA, age at admission and sex were not related to effective research communication. The correlations of research communication with these variables are shown in Table 22.

Grouping by Effective Research Communication and Duration from Admission to Ph.D.

In order to synthesize the findings for admission to Ph.D. duration and effective research communication, means and distributions of variables related to grouping on these two dimensions are reported in Tables 8 and 9.

Correlates of Attrition

Twenty-four of the 204 doctoral candidates in this study who completed comprehensive examinations from Fall term 1963 through Summer term 1965 did not complete the doctoral program by the end of Summer term 1968. The attrition rate at the ABD stage, based on these figures, is 12%.

Analysis indicated that ABD's completed more total credits during their doctoral program than did graduates. Because ABD's have not completed their dissertations, thesis credits (36 credits) are not included in the total number of program credits. Table 10 gives the average number of total program credits completed during

TABLE 8.--Means of variables related to groups based on median score RII and median elapsed time from admission to Ph.D. for graduates.

	Group 1 More Res. Comm. Shorter Duration N=54		Group 2 More Res. Comm. Longer Duration N=39		Group 3 Less Res. Comm. Shorter Duration N=42		Group 4 Less Res. Comm. Longer Duration N=45	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Total Res. Prep. Credits	21.63	8.76	16.41	10.42	16.33	10.60	14.67	9.17
Doctoral GPA	3.65	.20	3.55	.17	3.69	.19	3.56	.27
Total Program Credits	69.70	13.97	69.23	14.19	65.31	14.21	74.22	13.48
Age at Ph.D.	34.70	5.34	40.79	5.93	35.95	6.16	39.36	7.09

TABLE 9.--Distributions of variables related to groups based on median score RII and median elapsed time for admission to Ph.D. for graduates.*

	Group 1 More Res. Comm. Shorter Duration		Group 2 More Res. Comm. Longer Duration		Group 3 Less Res. Comm. Shorter Duration		Group 4 Less Res. Comm. Longer Duration		N
	%	N	%	N	%	N	%	N	
Degree									
Ph.D.	36	(43)	17	(21)	28	(34)	19	(23)	121
Ed.D.	19	(11)	30	(18)	14	(8)	37	(22)	59
Department									
El./Spec.	33	(3)	22	(2)	11	(1)	33	(3)	9
Sec./Curr.	32	(15)	23	(11)	23	(11)	21	(10)	47
Admin/HE	12	(7)	23	(14)	32	(19)	33	(20)	60
CPS & EP	45	(29)	19	(12)	17	(11)	19	(12)	64
Assist.									
No	23	(23)	26	(27)	18	(18)	34	(34)	102
Held	40	(31)	15	(12)	31	(24)	14	(11)	78

*Read Table 9, 36% of the Ph.D.'s and 19% of the Ed.D's were in Group 1. Percentages may not add to 100 because of rounding.

the doctoral program. The standard deviations indicate that ABD's are less variable than graduates in total number of program credits completed.

TABLE 10.--Mean number of total program credits completed for the doctoral program by graduates and ABD's.

	N	Mean Number Total Credits	Standard Deviation
Graduates	180	69.70	14.18
ABD's	24	75.83	12.55

None of the other major variables were related to attrition. Means, frequencies and correlations of demographic and institutional variables for Graduates and ABD's are given in Tables 20, 21 and 22.

It is interesting to note that while ABD's extend elapsed time after comprehensive exams (the criterion by which they are defined) they do not extend elapsed time from admission to comprehensive exams more than graduates do. As shown in Table 16, average elapsed time from admission to comprehensive exams was 17.16 terms for graduates and 16.88 terms for ABD's.

Kind of Research Preparation

For exploratory question II, the average number of courses completed in each kind of research preparation is shown in Table 11.

TABLE 11.--Mean number of courses in each kind of research preparation completed by graduates and ABD's.

Mean No. of Courses in:	Grads N=180		ABD's N=24		Overall N=204	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Theory/Theory Construction/Logic	2.09	1.46	1.83	1.55	2.06	1.47
Statistics/Mathematics	1.63	1.61	1.71	1.46	1.64	1.59
Research Methods	.96	.85	.75	.90	.93	.86
Measurement/Evaluation	.85	1.14	.75	.94	.84	1.12

Number of courses completed in each kind of research preparation did not differentiate ABD's from Graduates.

Number of credits completed in each kind of research preparation varied by department and major area within departments. Average number of credits completed in each kind of research preparation course for each department and major area is reported in Table 12.

As indicated in Table 13, number of credits completed in each kind of research preparation also differed by cognate area. Doctoral candidates whose cognate area was Psychology completed more credits in theory, measurement and statistics while those whose cognate was Sociology completed more credits in research methods.

For exploratory question III, Table 13 indicates that total amount of research preparation was greater for doctoral candidates whose cognate was Psychology

TABLE 12.--Mean number of credits completed in each kind of research preparation course by department and major area for graduates and ABD's.

Major	N	Mean No. Credits Theory	Mean No. Credits Research Methods	Mean No. Credits Meas.	Mean No. Credits Stat.
Elementary	6	6.00	3.50	5.67	4.00
Special	6	6.00	3.00	2.50	7.17
Overall El/Spec	12	6.00	3.25	4.08	5.58
Secondary	2	6.00	1.50	1.50	3.50
Curriculum	27	5.37	4.33	1.11	4.48
Soc/Phil	9	3.33	4.00	.33	2.67
Bus/Dist	5	10.60	1.80	.60	7.00
Industrial	2	1.50	3.00	3.00	3.50
Agriculture	4	3.00	4.50	.75	6.00
Home Economics	3	8.00	5.00	2.00	6.67
Overall Sec/Curr	52	5.37	3.92	1.04	4.57
Adult	24	2.75	1.63	1.71	.71
Higher	10	3.00	4.00	2.70	2.80
Administration	33	6.12	3.24	.55	2.36
Overall Ad/H.E.	67	4.45	2.78	1.28	1.84
Couns/P.S.	55	8.67	2.18	4.73	8.65
Ed. Psych.	9	7.00	3.67	3.67	7.89
Meas./Research	9	9.33	2.67	7.00	14.78
Overall CPS & EP	73	8.55	2.42	4.88	9.32

TABLE 13.--Mean number of credits completed in each kind of research preparation course by cognate area for graduates and ABD's.

Cognate	N	Number Credits Theory		No. Credits Research Methods		No. Credits Measurement		No. Credits Statistics		Overall	
		$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Sociology	97	5.52	4.13	3.44	3.11	1.56	2.41	4.08	4.26	14.59	8.25
Psychology	53	8.79	4.28	2.34	2.20	5.98	4.69	9.45	4.41	26.61	7.87
Other	54	5.04	4.32	2.69	2.66	1.43	1.96	3.91	6.12	13.06	9.93
Overall	204	6.24	4.47	2.97	2.81	2.67	3.64	5.43	5.39		

than for doctoral candidates whose cognate was Sociology or categorized as "other." In addition, the overall standard deviations indicate that candidates whose cognate was Psychology varied the least in amount of research preparation.

Undergraduate Major

For exploratory question IV kind of undergraduate major was not related to effective research communication. Average scores on the RII by kind of undergraduate major are reported in Table 14.

TABLE 14.--Mean score on RII by kind of undergraduate major for graduates.

Undergraduate Major	N	Mean Score RII	Standard Deviation
Behavioral Science	20	12.45	2.19
Physical Science	38	10.95	2.97
Other	112	11.04	3.01
Overall	170*	11.18	2.94

*Undergraduate major was not available in the records of 10 graduates.

It is interesting to note that undergraduate major varied by departmental affiliation. Distribution of kind of undergraduate major by departments is reported in Table 15.

TABLE 15.--Distribution of kind of undergraduate major by departments for graduates and ABD's.

Department	Behavioral Science %	Behavioral Science n	Physical Science %	Physical Science n	Other %	Other n	N
El/Spec	9	(1)	9	(1)	82	(9)	11
Sec/Curr	8	(4)	20	(10)	72	(36)	50
Ad/Higher	2	(1)	24	(15)	75	(47)	63
Couns/P.S. Ed. Psy.	26	(18)	21	(15)	53	(37)	70
Overall		(24)		(41)		(129)	194*

*Undergraduate major was not available in the records of 10 graduates.

Exploratory Question V

Duration of the doctoral program did vary by departmental affiliation and by major area within the department. Average number of terms from admission to Ph.D. for each department and major area is reported in Table 6.

Elapsed Time Measures

Average amount of elapsed time for various time periods of post-bachelor's education are given in Table 16. All time lapse measures are from completion of one stage through completion of the next stage. Except for extending the time after comprehensives past three years,

TABLE 16.--Mean elapsed time in terms* and years for various periods of post-bachelor's education for graduates and ABD's.

Elapsed Time	In	Grads N=180		ABD's N=24		Overall N=2-4	
		$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
B.A. - M.A.	years	4.96	4.27	4.33	2.62	4.89	4.10
M.A. - Ph.D. Admission	years	3.20	3.56	2.63	3.46	3.12	3.54
Admission - Coursework	terms	14.81	9.37	15.08	7.20	14.84	9.12
Coursework - Comprehensives	terms	2.35	5.39	1.79	6.41	2.28	5.51
Comprehensives - Orals	terms	4.98	3.79	--	--	--	--
Orals - Ph.D.	terms	.27	.56	--	--	--	--
B.A. - Ph.D.	years	13.54	5.97	--	--	--	--
M.A. - Ph.D	years	8.72	4.36	--	--	--	--
Admission - Ph.D.	terms	22.42	10.97	--	--	--	--
Coursework - Ph.D.	terms	7.60	6.04	--	--	--	--
Comprehensives - Ph.D.	terms	5.26	3.80	--	--	--	--
Admission - Comprehensives	terms	17.16	10.22	16.88	8.20	17.13	9.99

*Number of terms reported includes summer term thus, 4 terms per year.

none of the elapsed time measures differentiated ABD's from Graduates.

Extended Duration Indices

The number of doctoral candidates who extended admission to comprehensive exams past 5 years, comprehensive exams to Ph.D. past 3 years and admission to Ph.D. past 8 years is reported in Table 17. Because the time period selected for the study allowed up to 5 years from completion of comprehensives to graduation, 8 graduates exceeded the 3 year period from comprehensives to Ph.D.

Eighty-eight (43%) of the 204 doctoral candidates extended at least one of the duration criteria set by the university. Sixty-seven (76%) of these 88 who did extend the criteria extended the time from admission to comprehensives past 5 years.

Ideal Duration Indices

Approximate median elapsed times of 4 years or less from admission to comprehensives, 1 year or less from comprehensives to Ph.D. and 5 years or less from admission to Ph.D. were used as ideal time indices.

Correlates of ideal duration from admission to comprehensives and admission to Ph.D. are reported in Table 18. It should be noted that these two indices are overlapping and therefore include many of the same subjects

TABLE 17.--Number of graduates and ABD's who extended duration from admission to comprehensives past 5 years, comprehensives to Ph.D. past 3 years and admission to Ph.D. past 8 years.

Extended:	No. Graduates with El. Time Ad.-Ph.D. <8 yrs.	>8 yrs.	Total No. Grads	No. ABD's	Overall	% of 204
None	116	--	116	--	116	57
Only Ad-Comp >5	26	30	56	--	56	28
Only Comp - Ph.D. >3	5	--	5	16*	21	10
Both	--	3	3	8	11	5
Overall	147	33	180	24	204	
Total Ad-Comp >5 years			59	8	67	33
Total Comp-Ph.D. >3 years			8	24	32	15
Total Ad-Ph.D. >8 years			33	12-24*	45-57*	22-28*

*This figure includes 12 ABD's who, at Summer Term 1968 had not yet extended the elapsed time from admission past 8 years.

TABLE 18.--Correlates of ideal duration from admission to comprehensives 4 years or less and admission to Ph.D. 5 years or less for graduates and ABD's.

	N	El. Time Ad. - Ph.D. ≤ 5 years = 0(N=99) > 5 years = 1(N=105)	El. Time Ad. - Comps ≤ 4 years = 0(N=116) > 4 years = 1(N=88)
Sex (M=1, F=2)	204	.15	.18
Degree (Ph.D.=1, Ed.D.=2)	204	.30	.28
Assist. (None=0, Held=1)	204	-.30	-.37
Credits in Res. Prep.	204	-.19	-.25
Jr. - Sr. GPA	142	-.17	-.19
Doctoral GPA	204	-.25	-.23
Total Program Credits	204	.15	.19

(e.g. 81 of the 105 doctoral candidates who extended admission to Ph.D. past 5 years also extended admission to comprehensives past 4 years).

Cognate area, departmental affiliation and undergraduate major were related to one ideal duration index, admission to comprehensives 4 years or less. Distributions of these variables are shown in Table 19.

TABLE 19.--Distributions of cognate area, departmental affiliation and undergraduate major by ideal duration of admission to comprehensive exams 4 years or less for graduates and ABD's.

	Ad. - Comps ≤4 years		Ad. - Comps >4 years		
	%	n	%	n	N
Cognate					
Sociology	52	(50)	48	(47)	97
Psychology	70	(37)	30	(16)	53
Other	54	(29)	46	(25)	54
Overall		(116)		(88)	204
Department					
El/Spec	50	(6)	50	(6)	12
Sec/Curr	58	(30)	42	(22)	52
Admin/HE	43	(29)	57	(38)	67
Couns P.S./Ed Psych	70	(51)	30	(22)	73
Overall		(116)		(88)	204
U.G. Major					
Behavioral Science	79	(19)	21	(5)	24
Physical Science	42	(17)	58	(24)	41
Other	57	(74)	43	(55)	129
Overall		(110)		(84)	194*

*Undergraduate major was not available in the records of 10 graduates.

To summarize, doctoral candidates who completed comprehensive exams in four years or less from admission were more likely to:

1. be male;
2. have enrolled for a Ph.D. rather than Ed.D.;
3. hold an assistantship;
4. complete more credits in research preparation courses;
5. have higher grades both in the junior-senior undergraduate years and the doctoral program;
6. complete fewer total program credits;
7. have Psychology as a cognate;
8. be in the Department of Counseling, Personnel Services and Educational Psychology;
9. have an undergraduate major in the behavioral sciences.

Eighty-five doctoral candidates completed the doctorate in one year or less from completion of comprehensive exams. None of the major variables selected for this study were correlated with elapsed time from comprehensive exams to Ph.D. of one year or less.

Additional Tables

A summary of the means and frequencies of variables selected for the study and discussed previously are reported in Tables 20 and 21. Correlations of major

variables are given in Table 22 and Table 25 (Appendix VI).

It is interesting to note that score on the Miller Analogies Test, often used as a situation criterion for admission to graduate school, is positively related to amount of research preparation but is not associated with duration, attrition or effective research communication. Junior-senior undergraduate GPA, also often used as a selection criterion, is associated with shorted duration of the doctoral program and more research preparation but is not related to either effective research communication or attrition at the ABD stage.

Summary

Results of the analyses indicated support of Hypotheses 1a, 1b, and 2 but not Hypothesis 3. Thus, the greater the amount of research preparation a doctoral candidate completes during the doctoral program: (1) the shorter is the duration of the doctoral program and (2) the more effective is the research communication. The amount of research preparation was not related to attrition at the ABD stage. Analyses also indicated that the shorter the duration from admission to Ph.D., the more likely it is that the doctoral graduate:

1. received a Ph.D. rather than an Ed.D;
2. held an assistantship;

TABLE 20.--Means of demographic and institutional variables for graduates and ABD's.

	Grads N=180			ABD's N=24			Overall N=204		
	$\bar{X}$	S.D.		$\bar{X}$	S.D.		$\bar{X}$	S.D.	
Age at Graduation	37.49	6.57	(N=179)						
Jr. - Sr. GPA	3.01	.46	(N=121)	2.90	.48	(N=21)	2.99	.46	(N=142)
# Courses in:									
Theory	2.09	1.46		1.83	1.55		2.06	1.47	
Res. Meth.	.96	.85		.75	.90		.94	.86	
Meas/Eval	.85	1.14		.75	.94		.84	1.12	
Stat/Math	1.63	1.61		1.71	1.46		1.64	1.59	
TOTAL # Res. Courses	5.53	3.07		5.04	3.83		5.48	3.16	
# Credits in:									
Theory	6.34	4.45		5.50	4.65		6.24	4.47	
Res. Meth.	3.06	2.80		2.29	2.80		2.97	2.81	
Meas/Eval	2.71	3.72		2.37	3.03		2.67	3.64	
Stat/Math	5.42	5.48		5.50	4.74		5.43	5.39	
TOTAL # Credits Res. Prep.	17.52	10.00		15.67	11.96		17.31	10.23	
Miller Analogies	52.89	15.04	(N=155)	55.20	12.58	(N=20)	53.15	14.77	(N=175)
Score RII	11.27	2.91		- -	- -		- -	- -	
Age at Admission	31.96	5.85	(N=179)	32.46	6.35		32.02	5.90	(N=203)
Total Program Credits	69.71	14.18		75.83	12.55		70.43	14.11	
Doctoral GPA	3.62	.22		3.62	.18		3.62	.21	

TABLE 21.--Frequencies of demographic and institutional variables for graduates and ABD's

	Grads	ABD's	Overall
Sex			
M	163	20	183
F	17	4	21
Degree			
Ph.D.	121	18	139
Ed.D.	59	6	65
Department			
El/Spec	9	3	12
Sec/Curr	47	5	52
Admin/HE	60	7	67
Couns. P.S./Ed Psych	64	9	73
Assist.			
None	102	15	117
Held	78	9	87
Cognate			
Sociology	87	10	97
Psychology	47	6	53
Other	46	8	54
U.G. Major			
Behavioral Sci.	20	4	24
Physical Sci.	38	3	41
Other	112	17	129

TABLE 22.--Correlations of major variables with duration, attrition and effective research communication.

	# Terms Ad-Ph.D.		Total Score RII		Grad./ ABD	
	r	N	r	N	r	N
# Credits Res. Prep	-.21	180	.24	180	-.06	204
Jr. Sr. GPA	-.19	121	-.04	121	-.09	142
Doctoral GPA	-.22	180	.00	180	.00	204
Ph.D./Ed.D.	.38	180	.01	180	-.05	204
No Assist./Assist.	-.31	180	.04	180	-.04	204
Total Program Credits	.15	180	.00	180	.14	204
Age at Admission	.08	179	-.05	179	.03	203
Age at Graduation	.48	179	-.08	179	--	--
Miller Analogies	-.04	155	.02	155	.05	175
Male/Female	.09	180	.00	180	.08	204

3. received higher grades during the junior-senior undergraduate years and during the doctoral program;
4. completed fewer program credits;
5. had an undergraduate major in the behavioral sciences.

Average duration by departmental affiliation and major area within departments is reported in Table 6.

The relationships listed above for duration from admission to Ph.D. also hold for an ideal duration from admission to comprehensives of 4 years or less. In addition, doctoral candidates who take 4 years or less from admission to comprehensives are more likely to be male and have Psychology as a cognate.

Effective research communication varied by departmental affiliation and major area within departments as reported in Table 7. ABD's completed more total program credits than did graduates.

Mean elapsed time for various duration periods and number of doctoral candidates who exceed the university time criteria are reported in Tables 16 and 17. Means and frequencies of demographic and institutional variables are shown in Tables 20 and 21. Correlations of major variables with duration, attrition and effective research communication are shown in Table 22.

A correlation matrix of major variables for graduates and ABD's is given in Table 25, Appendix VI.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

A synthesis of the findings reported in Chapter V, conclusions and recommendations concerning duration, attrition, research communication and research preparation are presented in this chapter.

Duration of the Doctoral Program

B.A.-Ph.D. Elapsed Time

Elapsed time from B.A. to Ph.D. ranged from 3 years to 38 years. The average elapsed time from B.A. to Ph.D. of 13.5 years for the doctoral graduates in this study is very close to the median of 13.8 years reported by the National Academy of Sciences [23] for doctoral graduates in Education. The means of 8.9 and 9.2 years from B.A. to Ph.D. reported by Tucker [31] and Wilson [35] indicate that doctoral graduates in four fields outside of Education take approximately four years less from B.A.-Ph.D. than doctoral graduates in Education.

Thus, the findings in this study correspond with findings from other research that B.A.-Ph.D. time lapse is: (1) approximately 13 1/2 years for doctoral candidates

in Education, and (2) longer in Education than other studies have shown for other fields.

M.A.-Ph.D. Elapsed Time

Elapsed time from M.A. to Ph.D. ranged from 1 3/4 years to 30 years. The average elapsed time from M.A. to Ph.D. of 8.7 years for the doctoral graduates in this study is also similar to the median of 8.4 years reported by the N.A.S. [23] for doctoral graduates in Education. The means of 4.8 and 5.9 reported by Tucker [31] and Wilson [35] indicate that doctoral graduates in four fields outside of Education take 3 to 4 years less from M.A. to Ph.D. than doctoral graduates in Education.

Again, the findings in this study correspond with findings from other studies that M.A.-Ph.D. time lapse is: (1) approximately 8 1/2 years for doctoral graduates in Education, and (2) longer in Education than other studies have shown for other fields.

Admission to Ph.D. Elapsed Time

Elapsed time from admission to Ph.D. ranged from 7 terms (1 3/4 years) to 59 terms (14 3/4 years). Average elapsed time from admission to Ph.D. was 22.42 terms or approximately 5 1/2 years. The extended duration indices given in Table 17 indicate that from 22%-28% of the doctoral candidates in this study extended the

university criterion of 8 years from admission to Ph.D. In addition, ideal duration indices given in Table 18 indicate that 10% or approximately half of the doctoral candidates extended elapsed time from admission to Ph.D. past 5 years.

The findings that approximateley one-fourth of the doctoral candidates extended admission to Ph.D. past 8 years and approximately one-half past 5 years, indicate that admission to Ph.D. time lapse is: (1) long for many doctoral candidates in Education, and (2) far greater than the time required to complete the doctoral program.

Other Elapsed Time Measures

The elapsed time indices in Table 16 indicate which periods of post-bachelor's education might be considered as extended. Approximate means in number of years elapsed time for each of these periods is:

1. B.A. -- M.A., 5 years;
2. M.A. -- AD., 3 years;
3. AD. -- Course work, 3 3/4 years
4. Coursework -- Comps, 1/2 year;
5. Comps -- Ph.D., 1 1/4 years.

The time periods which seem to be extended for these doctoral candidates are: (1) B.A. to M.A., (2) M.A. to admission, and (3) admission to coursework.

Correlates of Duration

The finding that the greater the amount of research preparation a doctoral candidate completes during his doctoral program, the shorter is the elapsed time from admission to Ph.D. does support the relationship hypothesized in the theoretical model. That is, the more prepared an individual is, the better will be the performance--in this case, shorter duration. However, until all the relationships in the model are tested, the full model must remain tentative. In addition, the correlates of shorter duration suggested by the analysis may modify interpretation of the relationship between research preparation and duration.

For example, a greater amount of research preparation and a behavioral science undergraduate major were associated with shorter duration from admission to Ph.D. In addition, a cognate in Psychology was associated with an ideal duration of 4 years or less from admission to comprehensives. Affiliation with the department of Counseling, Personnel Services and Educational Psychology not only was related to shorter duration of the doctoral program but also with the three variables mentioned above. That is, doctoral candidates in the CPS & EP department: (1) completed more credits in research preparation courses, and (2) had cognates in Psychology and undergraduate majors in the behavioral sciences more

often than did doctoral candidates in other departments. However, there were no departmental differences in the other correlates of duration: (1) proportion of Ph.D.'s, (2) proportion of assistantships, (3) junior-senior GPA and doctoral GPA, (4) total number of program credits, and (5) proportion of males. Thus, although departmental affiliation is associated with some correlates of shorter duration, it cannot be suggested as the major factor in shorter duration.

Upon examining the correlates of duration, one might speculate that motivation is an important factor in duration of doctoral study. For example, although score on the Miller Analogies Test, considered one of the better indicators of academic potential, was not related to duration, higher grade point average for doctoral course-work was associated with shorter duration. It is possible that those candidates with higher GPA's are motivated to perform well both in coursework and in duration.

When graduate assistantships are considered, again motivation seems a plausible factor. It requires a highly motivated individual to accept a graduate assistant-ship, often a less prestigious position than previous ones and usually accompanied by a lower income.

During the time of this study, the requirements for the Ph.D. in the College of Education included at least one language examination. Since the language requirement

is often considered one of the more difficult requirements, it is probable that candidates who enroll for the Ph.D. are more highly motivated to attain the degree perceived as more prestigious.

In addition, many doctoral candidates in Education hold responsible, full time positions which leave little time for doctoral work. Often, receiving the doctorate makes no difference either in salary or position for these individuals. For these individuals to complete the degree quickly, perhaps at some sacrifice, would seem to require strong motivation.

This discussion on motivation is, of course, highly speculative. In order to discover if motivation is a plausible factor in duration of doctoral study, further research is required.

Recommendations

If shorter duration from B.A. to Ph.D. is considered desirable, attention might be focused on the three time periods considered extended; B.A. to M.A., M.A. to Admission and Admission to Coursework. The apparent need is to: (1) attract candidates into the M.A. and Ph.D. programs earlier than at present and (2) after the candidate begins the doctoral program, find some means of motivating him to complete the coursework period at a faster rate.

An average of almost four years from admission to coursework completion does appear excessive. Since the doctoral

candidates completed an average of 70 credits, or approximately 17-23 courses, it is probable that many of them averaged less than 2 courses per term. The extended duration indices indicated that 76% of those who did extend the university time criteria, extended the time from admission to comprehensives past 5 years. As this period included admission to coursework for 164 of the doctoral candidates, and since average time from coursework to comprehensives is one-half year, it seems clear that elapsed time from admission to coursework completion is one time period of the doctoral program on which to concentrate efforts toward shorter duration.

Although the amount of research preparation completed by doctoral candidates did not account for much of the variance in duration, the correlation between the two variables suggests that a relationship exists. In addition, the standard deviations given in Tables 16 and 20 indicate that these doctoral candidates are highly variable both in the length of the doctoral program and in the amount of research preparation completed. Considering that doctoral candidates in Education are a heterogeneous group in respect to research preparation and duration of the doctoral program, and that amount of research preparation completed is related to duration of the doctoral program, it is recommended that research preparation be considered as one focus of the doctoral program for <u>all</u> candidates.

Attrition at the ABD Stage

The attrition rate of 12% for the ABD's in this study is higher than the 8% attrition rate reported by Tucker [31] for ABD's. However, Tucker selected doctoral candidates from four fields outside of Education. Since attrition rate of ABD's is reported to be higher in Education [15], it is possible that this difference in attrition rates reflects a difference in fields.

In addition, Tucker defined ABD's as individuals who were enrolled for doctoral work between 1950 and 1953 and had completed all requirements but the dissertation by 1962. In this study, ABD's were defined as doctoral candidates who completed comprehensive exams (and therefore had completed any language requirements and at least 80% of the coursework) from Fall term 1963 through Summer term 1965 and had not graduated by the end of Summer term 1968. The different time criteria in this study may partially account for the higher attrition rate.

It should be pointed out that attrition rate at the ABD stage is probably much lower than attrition at earlier stages of the doctoral program. Tucker [31] reported that attrition of post-master students from 24 universities ranged from 14 per cent to 67 per cent with an average of 38 per cent. Thus, the problem of attrition might be considered twofold: (1) attrition between admission to the doctoral program and completion of

comprehensives--or all requirements except the dissertation, and (2) attrition at the ABD stage. While attrition during the first time period is undoubtedly larger, attrition at the ABD stage is probably more serious in terms of more immediate doctorate production.

Correlates of Attrition

The results of the analyses suggested no correlates of attrition at the ABD stage except for total number of program credits. Because the analyses indicated that the amount of research preparation was not related to attrition, hypothesis 3 was not supported. When hypotheses are not supported it is customary to examine the selection of the subjects, the measures used and the theoretical approach to better understand the results.

For this study the subjects selected were, with the exceptions noted previously, the total population who completed comprehensive exams over a two year period, and had graduated or not graduated within the following 3 years. Thus, is appears that selection of subjects followed acceptable research procedures.

The measure used to define ABD's was non-completion of the Ph.D. over a 3-5 year period after completion of comprehensive exams. This seems to be a logical definition of an "all but dissertation" doctoral candidate.

The measure used to define amount of research preparation was the number of credits completed by doctoral

candidates in courses categorized as research courses. While this definition could be criticized from several aspects, such as the point that every different instructor of a particular course varies the kind of course coverage, the measure did correlate with both duration and effective research communication as hypothesized.

Therefore, if the selection of subjects and the measures used are considered appropriate, and until further research is conducted, neither the hypothesis nor the theoretical model is considered tenable concerning the relationship of attrition at the ABD stage and amount of research preparation.

The finding that the total number of program credits is greater for ABD's should probably be interpreted with caution. For example, it is possible that doctoral candidates who have not graduated during the time period expected of them by others, or who have long time lapses in attendance, may be required to take additional course work.

The significant outcome of this portion of the study may be that while ABD's do differ from graduates in amount of elapsed time after comprehensive exams, they do <u>not</u> differ from graduates in the amount of elapsed time from admission to comprehensive exams or other elapsed time measures. That is, these ABD's are apparently not "hard core" laggards since they do not take longer from B.A. to

M.A., from M.A. to admission, from admission to completion of course work or from course work to comprehensive exams than graduates do. In this study, other than program credits, ABD's seem to differ from graduates only in amount of elapsed time past comprehensive exams.

Speculating with the same rationale given in the previous section concerning duration, one might concur with Tucker [31] who concluded that lack of motivation (not measured by Tucker or in this study) is a major factor in attrition of doctoral candidates.

Recommendations

In view of the results of this study, it is recommended that further research be conducted to explore factors which may differentiate ABD's from graduates.

If it is decided to further explore research preparation of ABD's, the finding that 29% of the ABD's completed only one or no courses in research preparation may provide a productive basis for exploration. That is, is there a possibility of a critical or minimum amount of research preparation below which doctoral candidates tend to be ABD's and beyond which they tend to be graduates? In addition, future studies might include motivational factors thought to be associated with attrition at the ABD stage.

Because attrition is a problem throughout the doctoral program, it may also be productive to examine attrition at

different stages of the doctoral programs to see if similar factors are related to attrition at these different stages.

The findings reported in this study do not rule out the possibility that ABD's experience an extreme amount of dissonance about the dissertation task. Because motivation is aroused by slight to moderate variations of familiar situations, but not by difficult situations [16:56], and a moderate amount of dissonance is considered as motivating, it may be worthwhile to prepare doctoral candidates in research processes before they attempt the dissertation. In this way, dissonance created by the dissertation task might be kept at a moderate and motivating level rather than at an extreme and non-motivating level.

Research Communication

Average score on the Research Information Index, the instrument used to measure effective research communication, was 11.27 of a possible total score of 16 points.

The findings indicated that the greater the amount of research preparation completed during the doctoral program, the more effective is the research communication. This finding supports the relationship hypothesized in the theoretical model. That is, the more prepared an individual is, the better will be the performance--in this case more effective research communication.

Effective research communication was also associated with departmental affiliation. The highest average score on the RII was made by doctoral graduates in the department of Counseling, Personnel Services and Educational Psychology. This finding is commensurate with the career functions and expectations of that department. That is, because of the nature of their current and prospective careers, both faculty members and doctoral candidates in the CPS & EP department are more involved in research related duties than is usual in other departments.

The amount of research preparation completed during the doctoral program, a correlate of effective research communication, is greater for doctoral candidates in the CPS & EP department. This finding follows naturally from the expectation of career functions of individuals associated with the department.

Attention might be warranted by the overall average score of 11.27 on the RII. Because the instrument consists of 16 points considered essential for effective research communication, this average suggests that many doctoral candidates are not aware of the kinds of information to be included in a research report. While it can be argued that the dissertation abstract may be written quickly and carelessly, and indeed it may, it is quite natural for the individual experienced in conducting and reporting research to include essential bits of information

in the report, even though the report may be short. It is expected that such items as the research problem, procedures and findings would be included in the more lengthy dissertation. However, as mentioned previously, a short research report usually requires more sophistication of the writer in order to include the maximum amount of essential information in limited space. Therefore, the abstract, a short report, would be more likely to discriminate among doctoral candidates than the longer dissertation.

Recommendations

If doctoral candidates in Education, regardless of departmental affiliation, are expected to communicate research problems, procedures and findings effectively, the findings in this study suggest that these candidates can be partially prepared for research communication through coursework.

However, in view of the average score on the RII, even doctoral candidates who complete a greater amount of research preparation coursework do not communicate research as effectively as might be desired. Therefore, it is suggested that, in addition to coursework, tasks such as conducting, analyzing and reporting research be made available during the doctoral program. Thus, doctoral candidates will become more familiar with all of these

tasks and more doctoral candidates can be associated with research before they begin the dissertation process.

Research Preparation

The doctoral candidates in this study completed an average of 5 1/2 courses characterized as research preparation. Average number of research preparation courses varies by department from approximately 3 courses for the department of Administration and Higher Education to approximately 8 courses for the CPS & EP department. That is, research preparation courses would vary from approximately one-eighth to one-third of a 24 course doctoral program. The overall average of 5 1/2 research preparation courses would constitute less than one-fourth of a 24 course doctoral program.

If research is considered a major function of higher education, this appears to be a relatively small number of courses in which to prepare doctoral candidates for the research function.

The average number of courses in each kind of research preparation course were approximately: (1) two courses in theory, theory construction or logic, (2) one course in research methods, (3) one course in measurement or evaluation and (4) one and a half courses in statistics or mathematics.

Number of credits completed in each kind of research preparation course varied by departmental affiliation.

As shown in Table 12, doctoral candidates in the CPS & EP department completed more credits in theory, measurement or evaluation, and statistics or mathematics. Doctoral candidates from the department of Secondary Education and Curriculum completed more credits in research methods. Candidates from the department of Administration and Higher Education completed fewer credits in theory and statistics than any of the other three departments.

Cognate area was also associated with kind of research preparation. Doctoral candidates whose cognate area was Psychology completed more credits in theory, measurement and statistics while those whose cognate was Sociology completed more credits in research methods.

Thus, candidates in the CPS & EP department and candidates whose cognate was Psychology completed more credits in theory, measurement and statistics. Candidates in the Secondary Education and Curriculum department and candidates whose cognate was Sociology completed more credits in research methods. Because cognate area completed is associated with departmental affiliation, this finding is not unexpected. That is, many candidates from the department of CPS & EP have a cognate in Psychology and many candidates from the Secondary Education and Curriculum department have a cognate in Sociology.

Recommendations

Ultimately, the decision concerning the importance of research preparation for doctoral candidates lies with the separate departments and the candidates' guidance committees, each with somewhat differing goals and expectations for the individuals involved.

However, to produce doctoral graduates with little or no familiarity with research in an age when research, development and dissemination are highly desirable and often well supported functions is to do both the doctoral candidates and society as a whole a disservice. It is evident that society today needs individuals who can make rational judgments. Judgments made after consideration of evidence, appropriately gathered and analyzed, are almost always better than judgments based on no information or erroneous information. It is one of the functions of individuals in higher education to see that the appropriate information is available.

Therefore, it would seem almost obligatory to prepare doctoral candidates in research so they might better understand, conduct and disseminate research.

It is not always necessary to require separate courses in order to better prepare doctoral candidates in various aspects of research through coursework. One of the better methods of learning is by doing. Thus, an individual who is required to conduct a study associated

with the content of a particular course can gain much information about the research process.

Therefore, it is recommended that doctoral candidates be prepared for research related duties by:

1. completing coursework in research-related courses;
2. including research-related tasks in courses not considered as primarily research courses;
3. providing opportunities for doctoral candidates to be associated with research-related tasks outside of coursework.

These three related experiences should be provided prior to the beginning of the dissertation process so that the doctoral candidate can approach the dissertation task with a greater degree of preparation and familiarity which should, in turn, produce less dissonance and greater motivation. The prepared doctoral candidate is more likely to accomplish the dissertation process with realistic expectations and appropriate research procedures.

The dissertation, like any other research project, is hard work and usually requires several months. However, the dissertation process should not be so traumatic as to be a possible factor in duration and attrition of doctoral candidates nor should it be so unfamiliar a task as to lead doctoral candidates to unrealistic time expectations, unrealistic task expectations or inappropriate research procedures.

The Theoretical Model

The premise of the model given in Chapter III was that the more prepared an individual is, the better he will perform. The findings supported two of the three hypotheses derived from this premise. That is, the more research preparation a doctoral candidate completes, the more likely it is that he: (1) completes the doctoral program in a shorter amount of elapsed time, and (2) communicates research more effectively. However, the premise did not hold for attrition at the ABD stage.

The model also included intervening variables between the antecedent task preparation and the performance outcomes. It was posited that: (1) the greater the amount of task preparation, the greater the degree of task familiarity, (2) the less the task will be perceived as difficult, (3) the less dissonance the task will create, (4) the higher will be the motivation to accomplish the task, and (5) the better will be the performance.

Given that: (1) shorter duration was related to a higher grade point average, a Ph.D. rather than an Ed.D., and assistantship held, and (2) that it appears to require greater motivation to attain these three goals, motivation may be a plausible factor to consider in duration of doctoral study.

In addition, both effective research communication and attrition at the ABD stage undoubtedly involve

motivational aspects. Therefore, the intervening variable of motivation posited in the model is considered a factor worthy of future research. Future exploration of research preparation of doctoral candidates in Education might also include measures of research familiarity, candidate perception of the difficulty of the dissertation task and the amount of dissonance created by the dissertation task.

It seems apparent from this study that modifications are needed in order to improve prolonged duration of the doctoral program, attrition rate at the ABD stage and research communication of doctoral candidates in Education. While more research preparation is one factor to consider, it is not advocated as a panacea. What is needed is an encompassing program which includes processes and procedures associated with improvement in these problems. The findings and conclusions from this study and other research previously cited suggest that future investigations and current attention might be focused on: (1) the role of factors such as assistantships, grade point averages and research preparation in better performance in these problem areas and (2) the development of motivation for better performance in these problem areas. However, because of the unstructured nature of the doctoral program, efforts toward improvement of these problems will probably have to be generated from within the institution rather than from the doctoral candidates.

Summary of the Findings and Conclusions

Duration

1. The B.A. to Ph.D. average time lapse of 13 1/2 years and the M.A. to Ph.D. average time lapse of 8 1/2 years for doctoral graduates in Education in this study is longer than elapsed times reported in other studies for doctoral graduates in fields outside Education.
2. The admission to Ph.D. average time lapse of 5 1/2 years indicates that duration of the doctoral program is not only long but also far greater than the time required to complete the doctoral program.
3. Forty-three per cent [88] of the 204 doctoral candidates extended one or both of the university time criteria of: (1) completion of comprehensive exams 5 years after admission, or (2) graduation 3 years after comprehensive examinations.
4. Seventy-six per cent [67] of the 88 candidates who extended the time criteria, extended admission to comprehensive exams past 5 years.
5. Three time periods are considered extended: (1) B.A. to M.A., (2) M.A. to admission, and (3) admission to completion of coursework.
6. Although the magnitude of the correlations account for little variance in duration, shorter duration of

the doctoral program from admission to Ph.D. is associated with: (1) a greater amount of research preparation, (2) enrolling for a Ph.D. rather than an Ed.D., (3) holding an assistantship, (4) higher junior-senior undergraduate and doctoral GPA, (5) fewer number of total program credits completed, and (6) a behavioral science undergraduate major.

7. Duration from admission to comprehensives of four years or less is similarly related to the variables listed above in addition to: (1) having a cognate in Psychology, and (2) being male.
8. Affiliation with the CPS & EP department was associated with: (1) shorter duration from admission to Ph.D., (2) a greater amount of research preparation, (3) a behavioral science undergraduate major, and (4) a cognate in Psychology.
9. There were no departmental differences in: (1) proportion of Ph.D.'s, (2) proportion of assistantships, (3) junior-senior undergraduate and doctoral GPA, (4) total number of program credits, and (5) proportion of males.
10. Although affiliation with the CPS & EP department is associated with correlates of duration, departmental affiliation is not suggested as the major factor in duration.

11. Motivation is probably an important factor in shorter duration of the doctoral program.

Attrition

1. It is probable that the attrition rate of 12% for ABD's is higher than the 8% reported for other fields because of: (1) the difference between Education and other fields, and (2) the differing definitions of ABD's.
2. Attrition rate at the ABD stage is undoubtedly lower than the attrition rate at earlier stages of the doctoral program.
3. Since amount of research preparation was not associated with attrition and selection of the subjects and measures used is considered appropriate, the relationship hypothesized in the theoretical model is not considered tenable at this time.
4. Because various interpretations could be made of the finding that ABD's completed more total program credits than Graduates, this finding should be interpreted with caution.
5. Perhaps a significant finding is that ABD's do not differ from Graduates in any other elapsed time measures except extending the time after comprehensives past three years. Thus, these ABD's are not "hard core" laggards.

6. Lack of motivation is probably a major factor in attrition.

Research Communications

1. More effective research communication is associated with a greater amount of research preparation.
2. That more effective research communication and a greater amount of research preparation are associated with affiliation with the CPS & EP department is commensurate with the career functions and expectations within that department.
3. Average score on the RII suggests that many doctoral candidates are not aware of the kinds of information to be included in a research report.

Research Preparation

1. The average of 5 1/2 research preparation courses, which ranged from approximately 3 to 8 courses over departments and constituted from approximately one-eighth to one-third of total program courses, appears to be a relatively few number of courses devoted to preparation for a major function of higher education.
2. Since many candidates in the CPS & EP department have a cognate in Psychology and many candidates in the Secondary Education and Curriculum department have

3. cognate in Sociology, it is not unexpected that: (1) candidates from CPS & EP and candidates with a cognate in Psychology have a greater amount of research preparation in theory, measurement and statistics, while (2) candidates from the Secondary Education and Curriculum department and candidates with a cognate in Sociology have a greater amount of research preparation in research methods.

Summary of Recommendations

1. If shorter duration from B.A. to Ph.D. is desirable, attention should be given to attracting candidates into the M.A. and Ph.D. programs earlier than at present.
2. After candidates begin the doctoral program, efforts should be concentrated on finding some means of motivating them to complete the admission to completion of coursework period at a faster rate.
3. Because a greater amount of research preparation is associated with shorter duration of the doctoral program, research preparation might be considered one focus of the doctoral program for <u>all</u> candidates.
4. To avoid having candidates who prolong the doctoral program or who drop out at the ABD stage, it may be worthwhile to prepare candidates in research so that the dissertation process is perceived as familiar and not overly difficult. Thus, dissonance

about the dissertation task might be kept at a moderate and motivating level rather than at an extreme and non-motivating level.

5. If additional study is concerned with research preparation of ABD's, exploration of a possible minimum number of research courses may be fruitful.
6. Future research on attrition might be more productive if motivational measures are included.
7. Exploration of attrition rate and factors associated with attrition at different stages of the doctoral program would be valuable.
8. To better prepare doctoral candidates in research the College might arrange for more doctoral candidates to be involved with: (1) research-related coursework, (2) research-related tasks in non-research courses, and (3) research-related tasks outside of coursework.
9. The three related experiences listed above should be provided to doctoral candidates <u>prior</u> to the beginning of the dissertation process.
10. Future exploration of research preparation of doctoral candidates in Education might include measures of: (1) motivation, (2) research familiarity, (3) candidate perception of the difficulty of the dissertation task, and (4) the amount of dissonance created by the dissertation task.

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APPENDICES

APPENDIX I

The Research Information Index

THE RESEARCH INFORMATION INDEX

The Research Information Index (RII) was developed for the purpose of measuring the amount of research information communicated in a research report. Research information is considered to be communication which helps the reader to understand the research problem, procedures and findings.

An underlying assumption of the RII is that information in the research report should usually include: (1) a brief statement of the problem, (2) a description of the methods, techniques and data used, and (3) the major findings of the study; and that this information is basic to all research communication, regardless of the type of research conducted.

The whole research report is the unit to be analyzed. The report is scored on the presence of information commonly considered essential in research communication as well as the objectivity or specificity of the information. Thus, the total score reflects the assumption that objective and specific research communication which includes essential information is more informative than exclusive and less precise communication. Total score on the RII can range from zero to sixteen points. The

higher the score on the RII, the greater the amount of research information communicated by the research report.

While almost all reports include items such as the purpose or objectives, these items are retained so that the RII is more inclusive of essential information. Therefore, if desired, the RII may also be used as a check list of the kind of information to be included in research reports. If used in this manner, it should be noted that conclusions (recommendations, discussion, implications), omitted from the RII because of their subjective nature, are usually included in the research report.

The examples given are from existing research reports and are not intended to illustrate "good" or "bad" useage but rather: (1) how to apply the RII to the kinds of research communication likely to be found and (2) that one form of research reporting communicates more relevant research information than does another form.

THE RESEARCH PROBLEM

Score

1. STATEMENT OF THE PROBLEM

Statement of the Problem: Reference to the existing problem or concerns which prompted initiation of the research..... 1

Examples:

a. Special class placement has not improved academic performance of Educable Mentally Retarded students.

b. Thereis general agreement that Negro history is presented in a biased manner in children's history textbooks.

c. Inadequate attention has been paid the conceptual and empirical separation of the normative expectations directed toward a given social position.

d. Elementary school buildings are inadequate for present day instructional modes and media.

e. The conventional analysis of covariance is not appropriate when the covariate contains errors of measurement.

Absence of Statement of Problem..... 0

2. STATEMENT OF THE PURPOSE OR OBJECTIVES

Statement of the Purpose: Reference to the primary objectives, or hypotheses, or questions or purpose of the research..... 1

Examples:

a. The purpose of this study was to investigate the relationship between motivation and academic achievement for males in...

b. The primary objective of this research was to explore changes in number and kind of references to Negroes in history books from...

c. This study was designed to test hypotheses relating perceptual classifications of principals and teachers to frequency with which they interact.

d. The purpose of this study was to identify characteristics of great teachers...

Absence of Statement of the Purpose..... 0

Score

3. SPECIFICITY OF THE PURPOSE OR OBJECTIVES

Specific: Clearly specified objectives, hypotheses, or questions or purpose of the research..... 1

Example:

...to investigate change in academic self-concept during the second year of a special class...

Non-Specific: Vague reference to the purpose of the research..... 0

Example:

...to make a survey of prison inmates.

THE RESEARCH PROCEDURES

4. PRIMARY IDENTIFICATION OF THE SAMPLE OR POPULATION UNITS

Primary Identification: Major identification of the sample or population of Individuals, Communications, or Objects, or Events..... 1

Examples:

a. Individuals

Educable Mentally Retarded Students

Principals of Secondary Schools

Prison Inmates

An Influential Educator

b. Communications

Philosophies of Self-Actualization

Children's Picture Books

Diaries of Sino-Soviet Decision-Makers

c. Objects

Elementary Schools
Religious-Affiliated Colleges

d. Events

Dice throws

The sampling distribution of the test statistic...

Absence of Primary Identification..... 0

Score

5. SECONDARY IDENTIFICATION OF THE SAMPLE OR POPULATION UNITS

SECONDARY Identification: Any information in addition to primary identification, which further identifies the kind of research units selected for the sample or population..... 1

Examples:

a. Individuals

Educable Mentally Retarded students ranging in age from eight to sixteen...

b. Communications

Childrens Picture Books which use color illustrations...

c. Objects

Elementary schools which offer first through sixth grades...

d. Events

The sampling distribution of the test statistic arising from analysis of covariance procedures...

Absence of Secondary Identification..... 0

6. SETTING, EXTENT OR RANGE OF THE STUDY

Setting: Site, or range, or area, or time period covered by the study. Where or when or under what circumstances..... 1

Examples:

a. Individuals

...students selected from six Ohio public secondary schools...

b. Communications

Children's Picture Books published in Russia from 1915-1965...

c. Objects

...elementary schools in four Southern states...

d. Events

...the sampling distribution of the analysis of covariance when the covariate is estimated true scores rather than observed fallible scores.

Absence of Setting..... 0

Score

7. NUMBER OF SAMPLE OR POPULATION UNITS

Sample Size: Reference to the number of sample or population units for which data were collected..... 1

Examples:

a. Individuals

...65 Educable Mentally Retarded students...

b. Communications

Fifteen Children's Picture Books...

c. Objects

...six elementary schools which...

d. Events

...1,000 sampling distributions

Absence of Sample Size..... 0

8. INSTRUMENTATION

Instrumentation: Reference to the instruments or meadures used to define the variables..... 1

Examples:

a. Students were asked to respond to the Academic Aspiration Scale...

b. The amount of prejudice communicated was measured by counting the number of references to...

c. Schools were judged to be open or closed by...

d. The rapidity with which convergence occurred was shown...

Absence of Instrumentation..... 0

Score

9. DATA COLLECTION METHODS

Data Collection: Reference to how data were collected..... 1

Examples:

a. Student behavior was observed by...

b. Prisoners were interviewed...

c. Questionnaires were mailed to...

d. The XYZ Intelligence Test was given...

e. ...by randomly generated theoretical distributions...

f. The A Projective Test was given to the client...

g. Data were recorded from the records of the institution...

h. Each paragraph was examined by the raters...

Absence of Data Collection..... 0

10. DATA ANALYSIS*

Data Anlysis: Reference to how data were analyzed..... 1

Examples:

a. ...was exhibited by a significant linear trend...

b. The factor analyses resulted in...

c. Percentages were computed for...

d. It was determined by chi square techniques that...

e. Significant associations were found...

f. Differences in the various philosophies were indicated by differences in the number of references to...

Absence of Data Analysis..... 0

---

* Reference to data analysis sometimes occurs in the findings of the research report.

THE RESEARCH FINDINGS*

Score

11. STATEMENT OF THE FINDINGS

Statement of the Findings: Reference to positive or negative results or findings of the research..... 1

Examples:

a. There were no significant differences between the two groups on number of extracurricular activities...

b. Thirty seven (63%) believed that the supervisor...

Absence of Statement of the Findings..... 0

12. OBJECTIVITY OF THE FINDINGS

Objective: Statement of positive or negative findings indicating support by data analysis..... 1

Examples:

a. Academic aspirations did not change significantly...

b. 92% stated that...

Subjective: Statement in the findings with no referent or which is unsupported by data analysis..... 0

Examples:

a. It was not understood that this substitution takes place at times in middle-class speech.

b. There is a sensitivity, generally, to the position in which other members of their group find themselves.

---

* It should be noted that items 11-16 apply only to the research findings. Findings refer to results of the research and are separate from conclusions, recommendations, explanations or discussion which may be included in the research report.

Score

13. VERBS AND VERB CONNECTORS

Specific: Absence of weak verb phrases, or presence of unqualified verbs, or presence of weak verb phrases accompanied by an explanation..... 1

Examples:

a. Neither academic performance nor academic expectations changed...

b. Frequency of disciplinary action was negatively related to...

c. Although no significant differences were found, there appears to be a positive relationship between...

Non-specific:
Verbs which are carried by connectors which imply only possible or hypothetical relationships rather than relationships indicated by the results (e.g., appears to be, may indicate, seems, suggests)..... 0

Examples:

a. Frequency of occurrence seems related to...

b. Differences appear to be...

14. ADVERBS AND ADJECTIVES

Specific: Absence of non-specific adverbs or adjectives, or presence of non-specific adverbs and adjectives accompanied by an explanation or modifier..... 1

Examples:

a. ...were considerably higher at 42.25...

b. ...were slightly, but not significantly, higher...

Non-Specific: Adverbs or adjectives that tend to modify, restrict or tone down (slightly, occasionally, somewhat) or tend to exaggerate (definitely, considerably, extremely)..... 0

Examples:

a. ...were considerably higher...

b. Teachers were extremely...

Score Score

15. EVALUATION

Objective: Absence of unsupported evaluations or value statements, or presence of evaluations supported by data..... 1

Examples:

a. All of the respondents felt that children should be allowed to...

b. More than half of the group considered it a good practice...

Subjective: Value statements or statements which contain evaluative terms (good, bad, should, ought) not supported by data..... 0

Examples:

a. All groups should be allowed to...

b. It must be understood that...

16. QUANTITY

Specific: Absence of non-specific quantity reference or presence of specific quantity reference..... 1

Examples:

a. 57% of the prisoners...

b. There was a significant increase...

Non-Specific: Vague, ill-defined quantity reference (most, a great majority, a large amount, some)..... 0

Examples:

a. The great majority feel...

b. The greatest number had...

TOTAL SCORE FOR AMOUNT OF RESEARCH INFORMATION COMMUNICATED CAN RANGE FROM ZERO TO SIXTEEN POINTS.

APPENDIX II

Categories For Research Preparation Courses

CATEGORIES FOR RESEARCH PREPARATION COURSES

Categories one to six are intended only for courses which, in your judgement, are offered by your department or college for the purpose of preparing students to apply theoretical and/or methodological aspects of research. Category zero is for courses which do not meet this criterion. Courses which primarily cover reviews of research rather than application should not be included as research preparation courses.

PLEASE ANSWER QUESTION ONE FOR EACH 800 AND 900 LEVEL COURSE LISTED UNDER YOUR DEPARTMENT OR COLLEGE IN THE CATALOGUE.

1. To which one of the following categories would you assign this course?

   0. This course does not meet the criterion of preparing students to apply theoretical and/or methodological aspects of research.

   This course primarily covers:

   1. theory, theory construction or logic.
   2. research methods.
   3. measurement and/or evaluation.
   4. statistics and/or mathematics.
   5. computer applications.
   6. research design

2. Would you please list and place into categories one to six all 400 level courses in your department or college which are offered for the purpose of preparing students to apply theoretical and/or methodological aspects of research.

Course Number	Course Title	Category Number

APPENDIX III

Departments and Major Fields of Emphasis Within Departments, The College of Education Michigan State University

DEPARTMENTS AND MAJOR FIELDS OF EMPHASIS WITHIN DEPARTMENTS
THE COLLEGE OF EDUCATION, MICHIGAN STATE UNIVERSITY

1. Elementary and Special Education
    1. Elementary Education
    2. Special Education
2. Secondary Education and Curriculum
    1. Agriculture Education
    2. Business and Distributive Education
    3. Comparative and International Education
    4. Curriculum
    5. History and Philosophy of Education
    6. Home Economics
    7. Industrial Education
    8. Secondary Education
    9. Vocational and Technical Education
3. Administration and Higher Education
    1. Adult Education
    2. Higher Education
    3. Educational Administration
4. Counseling, Personnel Services and Educational Psychology
    1. Educational Psychology
    2. Counseling and Personnel Services
    3. Measurement, Evaluation and Research Design
5. Health, Physical Education and Recreation
    1. Health and Physical Educaton
    2. Recreation

APPENDIX IV

Categories for Undergraduate Majors

Categories for Undergraduate Majors

Behavioral Sciences

Agriculture Economics
Anthropology
Communication
Economics
Geography
Police Administration
Political Science
Psychology
Social Work
Sociology
Urban Planning

Physical Sciences

Anatomy
Animal Husbandry
Audiology
Biological Sciences
Chemistry
  Agriculture Chem.
Dairy
Engineering
  Chemical Eng.
  Civil Eng.
  Electrical Eng.
  Mechanical Eng.
  Metallurgical Eng.
Entomology
Foods
Forestry-Horticulture
Geology
Mathematics

Physical Sciences (cont.)

Microbiology
Nursing
Physics-Astronomy
Physiology-Pharmocology
Poultry-Soil Science
Public Health
Statistics
Surgery-Medicine
Veterinary Pathology
Wild Life
Zoology

Other Majors

Accounting
Advertising
Art
Business
  Personnel
Education
Foreign Studies
History
Home Management
Hotel Management
Industrial Arts
Journalism
Language-Literature
Library Science
Marketing
Music
Philosophy

Other Majors (cont.)

Radio-Television
Religion
Speech
Textiles

APPENDIX V

Tables of Scores for Interrater Reliability

TABLE 23.--Total scores on the Research Information Index used for interrater reliability prior to the study.

Abstract Number	Total Score Rater #1	Total Score Rater #2
1	12	10
2	7	5
3	12	12
4	14	15
5	14	14
6	9	9
7	8	8
8	6	8
9	8	8
10	13	14
11	14	15
12	13	15
13	12	12
14	15	15
15	14	15
16	12	15
17	15	15
18	8	10
19	11	11
20	12	13

$r = .92$

TABLE 24.--Total scores on the Research Information Index used for interrater reliability for the study.

Abstract Number	Total Score Rater #1	Total Score Rater #2
1	5	3
2	10	8
3	7	2
4	11	12
5	12	14
6	7	9
7	8	12
8	15	14
9	8	8
10	8	11
11	8	9
12	13	14
13	12	15
14	14	15
15	15	15
16	15	14
17	15	15
18	12	11
19	12	13
20	16	16

r = .87

APPENDIX VI

Correlation Table

TABLE 25.--Correlation matrix of major variables for graduates and ABD's.

	# Credits Res. Prep. (N=204)	Jr. Sr. GPA (N=142)	Doctoral GPA (N=204)	Degree Ph.D.=1 Ed.D.=2 (N=204)	Assist. None=0 Held=1 (N=204)	Total Program Credits (N=204)	Age at Admission (N=203)	Miller Analogies Test (N=175)	Sex Male=1 Female=2 (N=204)
# Credits Res. Prep. (N=204)	--								
Jr. Sr. GPA (N=142)	.20	--							
Doctoral GPA (N=204)	-.04	.35	--						
Degree Ph.D. = 1 Ed.D. = 2 (N=204)	-.05	-.10	-.11	--					
Assist. None = 0 Held = 1 (N=204)	.16	-.06	.02	-.14	--				
Total Program Credits (N=204)	.28	-.05	-.21	-.04	.01	--			
Age at Admission (N=203)	-.24	-.06	-.01	.01	-.23	-.09	--		
Miller Analogies Test (N-175)	.15	.08	.13	-.10	.13	.09	.08	--	
Sex Male = 1 Female = 2 (N=204)	.04	.17	.13	-.02	-.16	.02	.25	.10	--