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THE APPROPRIATENESS OF THE CRITERIA FOR INCLUSION OF SPECIAL EDUCATION STUDENTS IN THE MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM AT THE FOURTH-GRADE LEVEL

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THE APPROPRIATENESS OF THE CRITERIA FOR INCLUSION OF SPECIAL EDUCATION STUDENTS IN THE MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM AT THE FOURTH-GRADE LEVEL

By

Edmund John Shinsky

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ABSTRACT

THE APPROPRIATENESS OF THE CRITERIA FOR INCLUSION OF SPECIAL EDUCATION STUDENTS IN THE MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM AT THE FOURTH-GRADE LEVEL

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The purposes of this study were to examine the appropriateness of the existing criteria for special education students participating in the Michigan Educational Assessment Program (MEAP) test.

A total of 751 fourth-grade special education students from 97 of Michigan's 530 K-12 school districts participated in this study. To assure the generalizability of the study findings, a systematic stratification method was used in selecting the 97 districts. Seven categories of special education students participated in the study: educable mentally impaired, speech and language impaired, emotionally impaired, physically or otherwise health impaired, visually impaired, learning disabled, and hearing impaired. All special education students from the 97 sampled districts were to be included in the study.

The independent variables were the seven impairment groups, the percentage of reading and math instruction in special education, and the MEAP proctors' judgment of whether the mechanics of the test were appropriate for the students. The dependent variables were the MEAP reading and math scores.

The data gathered from this study were analyzed and statistical hypotheses tested through a series of one-way analyses of variance. F-ratios with statistical levels of alpha = .05 were accepted as statistically significant for this study. Planned comparisons were used to examine relationships among levels of independent variables. The overall findings suggested that special education students from various disability groups scored differently on the MEAP reading and math tests. Additional findings indicated that special education students who received a majority of their reading and/or math instruction in the general education classroom scored significantly higher on the MEAP reading and math tests than did special education students who received a majority of their math and/or reading instruction in special education classrooms. Examination of student scores on the MEAP test indicated that the proctors could accurately identify the students who had difficulty handling the mechanics of the MEAP test.

Based on these findings and the distribution of students regarding the percentage of reading and math instruction times, the present inclusion criteria for the MEAP test seem to be appropriate.

I wish to dedicate this dissertation to the persons listed herein, for it is only with their encouragement, support, and love that I have achieved this goal. I so dearly thank the Lord for granting me the skills and abilities to fulfill this task and also for knowing Him through those I am about to mention.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Using students' test results to assess their individual achievement and capability in specific academic areas is a topic in education that continues to receive national, state, and local attention. Assessments vary in scope from standardized achievement tests, to measures that gather information on students' strengths and weaknesses, to competency tests that use assessment-test data to make decisions regarding student entrance, promotion, retention, or graduation. Whether a state uses an assessment program or competency testing, there is a general commonality between testing programs that provides for accommodation of students with special needs.

State policy makers place great emphasis on the value of student test results, correlating them with the quality of individual school districts' educational programs. Major controversies have surfaced, concerning which students should or should not take the tests, along with who should graduate, based on their test results. This issue becomes most complex when one takes into account those students who require additional educational support, such as special education.

Michigan educators have wrestled with the dilemma of which students to test or not to test for several years. The present criteria for including special education students in the Michigan Educational Assessment Program (MEAP) were established in the 1978-79 school year. After a great deal of deliberation, the Research Evaluation and Assessment Services Advisory Committee set the standards for special education students' inclusion in the MEAP test. The advisory committee agreed that every student who receives 50% or more of his/her reading/English instruction per day in the general education classroom is to be tested; a student may be excluded from taking the tests only if he/she has been found eligible for special education through an Individualized Educational Planning Committee (IEPC) process and receives more than 50% of his/her reading/English instruction per day through special education programs and services. This may include students who are educable mentally impaired (EMI), speech and language impaired (SLI), emotionally impaired (EI), physically or otherwise health impaired (POHI), visually impaired (VI), learning disabled (LD), and hearing impaired (HI).

In a recent paper entitled "Policy Implications of Competency Testing as Part of High School Graduation at the Local, State, and National Level," Sharif Shakrani from the Michigan Department of Education (1980) pointed out that many states and hundreds of school districts have adopted competency testing as part of high school graduation criteria. Concerning the importance of such testing programs, Shakrani stated, "A viable competency testing program is

one in which student performance data are used as a basis for diagnosing weaknesses and necessary remediation not only for students but the educational system as a whole" (p. 8). If Shakrani's points are taken seriously, it is important that MEAP data on all students, including those in special education, be used to the maximum extent at all three Michigan testing levels: fourth, seventh, and tenth grades. With the current national concern for student attainment of minimum competencies, it is essential that information be gathered so that appropriate instruction and remediation can take place before any type of competency test is used to determine a student's candidacy for graduation.

The major problem to which the present study was addressed is that very little research has been done on handicapped students' participation in any type of assessment or competency testing. The criteria for handicapped students' inclusion in and performance on such tests, using test results to enhance the participation of handicapped students, and using handicapped students' test results to improve the special education curriculum are a few issues that have been addressed in a rudimentary fashion. In Michigan, no formal research has been conducted on handicapped students' participation in the Michigan Educational Assessment Program. It is this subject with which the present study was concerned.

Purpose of the Study

The primary purpose of this study was to investigate the appropriateness of existing criteria for including special education

students in the Michigan Educational Assessment Program (MEAP). As stated before, only those students who receive more than 50% of their reading/English instruction in general education programs are currently included in the MEAP testing. Hypotheses were tested concerning seven special education impairment groups (EMI, SLI, EI, POHI, VI, LD, HI) and their scores on the MEAP test at the fourth-grade level. Data were gathered on all special education students in the fourth grade, regardless of the amount of time they were integrated into general education English/reading. Additional information was collected on the percentage of reading and/or math instruction in special education the student received. Another purpose of the study was to determine whether there was a difference in mean MEAP reading and math scores of students for whom the mechanics of the test were judged appropriate and those for whom the test mechanics were judged not appropriate.

Importance of the Study

This study will provide initial data for the development of research-validated criteria for the inclusion of special education students in the Michigan Educational Assessment Program. The study is important for several other reasons, as well.

First, state and local agencies are obligated by the Fourteenth Amendment of the Constitution, by Public Law 94-142 (the Education of All Handicapped Children Act of 1975), and by Section 504 of the Rehabilitation Act of 1973 to make every effort possible to protect the equal-educational-opportunity rights of all handicapped

individuals. Public Law 94-142 enforces this protection by requiring that each public agency ensure that handicapped children are educated with nonhandicapped pupils as much as possible. Section 504 (Rehabilitation Act of 1973) mandates that "no otherwise qualified handicapped individual . . . shall, solely by reason of his handicap, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance" (45 CRF, sec. 81 and 84).

One of the major efforts that state and local agencies can pursue to ensure that their minimum-competency testing program complies with the requirements of the Fourteenth Amendment, Public Law 94-142, and Section 504 is to evaluate the involvement and performance of handicapped individuals in their testing program. The information gathered from the present study will provide state and local educational agencies with data from which they can maintain or develop strategies in the Michigan Educational Assessment Program that will allow handicapped students to participate in and benefit from the testing program as much as their nonhandicapped peers.

This study is also important because it provides a base of research data from which specific unanswered questions regarding handicapped students' involvement in state assessment or minimum competency testing programs can be addressed. Three of these questions are:

1. Is it appropriate to have uniform state assessment testing criteria for the inclusion of handicapped students?

2. Are special education students adequately prepared to take the state assessment test? That is, is there a match between the curriculum and the information on which they are tested?

3. Are state and local agencies using state assessment test results to help in the instruction of handicapped students?

There is a great deal of skepticism among Michigan educators regarding special education students' participation in and performance on the MEAP test. Some individuals feel that special education students' test scores lower the overall district performance level. The findings of this study can be used to address the assumption that the special education student is a factor in lowering MEAP scores.

In addition, this study is important because little research has been completed at either the state or the national level in regard to handicapped students participating in state assessment or minimum competency testing program. A majority of the literature reviewed was concerned with using minimum competency tests as a graduation consideration. To the writer's knowledge, no research has been done on elementary handicapped students' involvement in state assessment or competency testing. Researchers have mainly spoken to the fact that early assessment and intervention strategies are important in providing students with the best opportunity to pass the minimum-competency test as a graduation requirement.

Finally, this study is important because the information gathered can be related to testing programs in other states. As

the Michigan Educational Assessment Program is similar to assessment programs used in other parts of the country, the information derived from this study can provide valuable data for other states to use in accommodating handicapped students in their testing programs.

Generalizability of the Findings

The findings of this study are most generalizable to Michigan's fourth-grade special education population. However, the findings are also suggestive of what may be found at other grade levels. In addition, the study findings may be useful to other states using assessment or competency tests with special education populations.

Research Questions

This study was conducted in an attempt to answer the following research questions:

1. Do special education students from different impairment groups score differently in the areas of reading and math on the MEAP test?

2. Is there a difference in mean MEAP reading scores of special education students receiving different percentages of reading or math instruction in special education?

3. Is there a difference in mean MEAP math scores of special education students receiving different percentages of reading or math instruction in special education?

4. To what degree do the mechanics of test taking and the special education students' ability to understand the directions for

responding to questions, as assessed by MEAP proctors, affect the students' performance on the MEAP reading and/or math tests?

Definition of Terms

The following key terms are defined in the context in which they are used in this dissertation.

Assessment tests--instruments used to gather information on a student's strengths and weaknesses and to indicate skills the student has or has not achieved.

Competency tests--instruments used to determine a student's strengths and weaknesses and to make decisions regarding entrance, promotion, retention, or graduation.

Testing program--a program that uses a standardized test to show the relative strengths and weaknesses of a student within the group.

Michigan Educational Assessment Program (MEAP)--a statewide program used to assess student achievement in reading and mathematics (other subject areas are tested on a sampling basis).

> The MEAP tests are administered every fall to all fourth, seventh, and tenth graders. They provide information on what the state's students are learning in specific areas as compared with what the state wants them to know and do. The current assessment tests are objective-referenced sets of items measuring selected minimum-performance objectives in the subject areas of reading and mathematics. Each objective is measured by a set of three items. Objective attainment requires answering correctly at least two of the three items measuring each objective. The untimed tests allow students to work at their own pace. The tests were written by Michigan educators and field tested twice on a statewide sample of students. Following each tryout, the tests were reviewed and refined. The revised tests were approved by the State Board of Education and administered on a state-wide basis in 1980-81. (Michigan Department of Education, 1982, introduction)

Individual Educational Planning Committee (IEPC)--a committee of persons appointed and invited by the superintendent to determine a student's eligibility for special education programs and services, and if that student is found to be eligible for such programs, to develop an individualized education program for him/her.

Individualized Education Program (IEP)--an educational program developed by the IEPC; this program is reviewed annually.

Educable mentally impaired (EMI) students--those students determined by an IEPC to qualify for special education services and who manifest all of the following characteristics: (a) development at a rate approximately two to three standard deviations below the mean, as determined through intellectual assessment; (b) scores within approximately the lowest six percentiles on a standardized test in reading and arithmetic; (c) lack of development primarily in the cognitive domain; (d) impairment of adaptive behavior.

Emotionally impaired (EI) students--those students determined by the IEPC to quality for special education services and who manifest behavior problems primarily in the affective domain, over an extended period of time, which adversely affect their education to the extent that they cannot profit from regular learning experiences without special education support. The problems result in behaviors manifested by one or more of the following characteristics: (a) inability to build or maintain satisfactory interpersonal relationships within the school environment, (b) inappropriate behavior or feelings under normal circumstances, (c) general pervasive mood of unhappiness or

depression, and (d) tendency to develop physical symptoms or fears associated with personal or school problems. The term "emotionally impaired" also includes persons who, in addition to the preceding characteristics, exhibit maladaptive behaviors related to schizophrenia or similar disorders.

Hearing impaired (HI) students--those students determined by an IEPC to qualify for special education services and who manifest a hearing impairment that adversely affects educational performance. A determination of impairment is based on a comprehensive evaluation by a multidisciplinary evaluation team, which includes an otolaryngologist and an audiologist.

Learning disabled (LD) students--those students determined by an IEPC to quality for special education services and who manifest a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken, or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The category includes such conditions as perceptual handicaps, brain injury, minimal brain disfunction, dyslexia, and developmental aphasia. It does not include children who have learning problems that are primarily the result of visual, hearing, or motor handicaps; of mental retardation; of emotional disturbance; or of environmental, cultural, or economic disadvantage.

Physically or otherwise health impaired (POHI) students--those students determined by an IEPC to qualify for special education services and who manifest a physical or other health impairment that adversely

affects educational performance and that requires physical adaptation within the school environments.

Speech and language impaired (SLI) students--those students determined by an IEPC to qualify for special education services and who manifest communication impairments (articularion, voice, fluency impairment) that adversely affect their educational performance.

Visually impaired (VI) students--those students determined by an IEPC to qualify for special education services who manifest a visual impairment that interferes with development or adversely affects their educational performance.

Special education--specially designed instruction, provided at no cost to the parents, to meet the unique needs of a handicapped person; this includes classroom instruction, instruction in physical education, home instruction, and instruction in hospitals and institutions. Such education is designed to develop the maximum potential of a handicapped person.

Overview of Subsequent Chapters

Chapter II contains a review of literature on state assessment and minimum competency testing programs. Included are a general review of minimum competency testing, a discussion of the legal issues regarding such testing, and an examination of the issues surrounding inclusion of special education students in minimum competency testing.

The research methodology of the study is explained in Chapter III. The instrumentation and data-collection procedures are described, and the research hypotheses are stated.

Chapter IV contains the presentation and analysis of the data. It includes a description of the sample, by impairment category, the findings relating to the hypotheses tested, and a summary of the findings.

A summary of the study, results and conclusions of the study, and limitations of the research may be found in Chapter V. Recommendations for the Michigan Educational Assessment Program, as well as for further research, are also included.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

An extensive review of the literature was conducted on handicapped students' involvement in state assessment and minimum competency testing programs. Almost all of the research regarding handicapped students' involvement in state assessment testing programs centered on minimum competency testing. Whether a state uses an assessment or a minimum competency test (results of the latter are used for making decisions regarding entrance, promotion, retention, or graduation), the research on minimum competency testing can be useful to educators planning to accommodate handicapped students in a state assessment program. Therefore, to explore in detail the current status of special education students' involvement in state assessment programs, the theme of minimum competency testing was explored. The information reported in this chapter dates from the late 1970s until the present and was gleaned mainly from journal articles and papers presented at conferences.

The review is divided into three major topic areas that reflect the available research on handicapped students and minimum competency testing. The first section is a general review of minimum competency testing. The second part contains a discussion of legal

issues regarding minimum competency testing. The issues surrounding inclusion of special education students in minimum competency testing are explored in the third section of the literature review.

General Review of Minimum Competency Testing

The issues discussed in the literature regarding minimum competency testing can be categorized in several ways. Since minimum competetency testing and competency testing in general are tools used with the school population as a whole, many of the issues regarding testing the handicapped are interrelated and fall within the general themes covered in the literature. Therefore, the purpose of this section is to provide a general overview of the literature on minimum competency testing; several topics are examined that are relevant to the entire school population, including the handicapped.

Background of Minimum Competency Testing

Minimum competency testing was developed in response to society's demand for schools to be educationally accountable. Wise (1978) discussed the reasoning behind the adoption of such testing:

> Minimum competency testing is a recent "invention" designed to improve the schools. The last decade or two have witnessed a succession of similar inventions. These inventions have all been designed to make the operation of schools more "accountable," more "business like," and more "scientific." One by one, these inventions have been enacted into state law. The reasoning appears to be that
>
> 1. the schools are not producing well;
> 2. an invention appears that is said to improve schooling;
> 3. a state law embodying that invention is passed;
> 4. as required by law, the schools will produce well. (p. 596)

As the concern for educational accountability grew, minimum competency testing gained appeal as a possible means of improving the schools (Blau, 1978). According to Blau, the proponents of minimum competency testing suggest that such measurement is of benefit because

1. the high school diploma is of questionable value since social promotions begin at the first grade and continue onward through all twelve grades;
2. the level of attainment by high school graduates is decelerating constantly;
3. students lack motivation and they require something to make them more concerned about school;
4. teachers are not as competent as they ought to be; and
5. the fabric of intellectual society is deteriorating, and the school system is helping to hide this by continuing to process students without concern about the pursuit of excellence. (p. 173)

Educators, administrators, and behavioral scientists have debated whether minimum competency testing is the answer to existing educational concerns. Blau argued against the use of such testing. He cited the following reasons for his stand:

1. test instruments used in minimum competency evaluations are of limited validity;
2. aside from technical considerations, tests are not a very fair way of assessing educational progress;
3. testing is antiliberal and antiprogress;
4. tests label children and it is generally agreed that children should not be labeled; and
5. the use of minimum competency tests will force the schools to develop programs to "teach the test." (p. 174)

The National Education Association (NEA, 1978) took the following position on the major use of tests and voiced its concern about labeling and classifying students on the basis of these tests.

> The major use of tests should be to improve education--to diagnose learning diffculties and to plan learning activities in response to learning needs. Tests must not be used in any

> way to label and classify students, to track into homogeneous groups, . . . to perpetuate an elitism, or to maintain some groups of individuals "in their place" near the bottom of the socio-economic ladder.

Policy makers have stated a number of opinions and taken various positions on minimum competency testing. Whether these opinions and positions reflect a need to be educationally accountable or provide a tool to identify student needs, several questions remain regarding the implementation and value of minimum competency testing. The 13 issues posed by Howell (in Sechrest, 1981) in 1978 provide a synopsis of the questions concerning minimum competency testing with which educators and policy makers are still dealing:

1. Should the skills to be tested be "life skills" or "school skills?" A clear distinction can be drawn between the two types, and each is appropriate for particular purposes.
2. Once the type of skills has been determined, which of the specific skills should be considered to make up the "basics" within the type?
3. Once the type of skills has been determined, what would be the appropriate procedure for measuring the level of skills achieved? Life skills are best measured over time with life-like situations. School skills are best measured in a single test, usually a paper-and-pencil test.
4. When would be the appropriate time for minimum competency testing? If the test is to be simply an exit mechanism, the junior or senior year may be adequate. If the test is to be used as a part of the educational process, it should be administered as early as possible. The results could then be used in shaping the instructional programs. The basic criterion for the time chosen would be the purpose of the testing program.
5. Once an instrument or procedure has been developed or selected for use in a minimum competency testing program, who should select the standard for achievement? The answer to this question is critical.
6. Where do maximum standards and minimum standards meet? A major concern of educators is the possibility that establishing a floor of minimum requirements would have the effect of lowering the ceiling.
7. What accommodations should be made for failures? The common responses have been to offer additional opportunities to take

the test and to provide remediation to the student who failed the test. These approaches have been beneficial to many students when the remediation is well-conceived, but new approaches are needed.

8. How can a minimum competency testing program be financed? The development or selection process becomes prohibitively expensive for school systems with low tax bases. If a minimum competency program is to be educationally sound, it has to employ only well-constructed tests with high validity and reliability. These are costly.
9. What steps are possible to prevent a return to segregation? Students from low socio-economic backgrounds tend to do more poorly on standardized tests than those from higher socio-economic backgrounds. Since the ratio of non-white students to white students is higher in the lower socio-economic levels, the net effect would be resegregation of schools. This would occur as remediation programs are developed for students who have failed or have been identified as likely to fail.
10. For those states which choose to use life skills in their minimum competency testing programs, what should be done to assure that students are receiving an education in those skills? Few schools offer a program dealing with life skills.
11. When should minimum competency requirements be imposed on students? Should there be a "phase-in" period to allow students to prepare for the test? The question of the legality of imposing such a requirement on students who have not had foreknowledge of it has been questioned in the courts (e.g., Florida).
12. Should results from the minimum competency testing program be used in accountability considerations for teachers?
13. What is the legal status of the concept of minimum competency testing? Does it deny the students who fail the right to obtain an education? Proponents argue that it could assure that right by establishing standards. Opponents argue that it frequently penalizes students who fail because of factors beyond their control (e.g., imposition of the requirement at a late date in the school experience, test bias, handicapping condition, weak instructional program). (pp. 15-18)

Perspectives on Minimum Competency Testing

Opinions about minimum competency testing vary both among and within school board, educator, and student groups. In 1978, the National School Board Association polled school-board members for their opinions about issues involved with minimum competency testing.

Responses represented 5.5% of the nation's public schools. The general findings were as follows:

1. School leaders felt more inclined to criticize students, staff, or curriculum than to criticize, eliminate, or change tests in the event of students' MCT failure.
2. Modest differences in priorities appeared in what competencies school leaders believe should be tested.
3. Among school leaders there was a marked preference for MCT decisions made locally, a preference for citizen involvement, and a distrust of legislatures.
4. The majority of respondents achieved consensus in noting that MCT appeals to them. They felt that MCT aims to improve teaching and learning and seeks to document that every student is minimally competent.
5. There was consensus nation-wide about the value of giving a student several chances to pass a test, opportunity to prepare for a test, and some measure of discretion in the use of test scores. (Szafranlee, 1981, pp. 31-32)

In discussing the National School Board Association survey, Szafranlee pointed out that

> The survey was not negligent in uncovering opinions about MCT specifically with the handicapped. The survey showed that:
>
> 1. Respondents were unsure whether the same minimums should apply to all students, but 21 percent felt handicapped students should achieve the same minimal competency.
> 2. MCT was considered a good "equity" measure to be used to meet the needs of all students, give all students maximum opportunity, to make sure schools are helping all students.
> 3. MCT was seen as needed to help certain types to graduate (below average in "book intelligence"). (p. 32)

Educators have voiced their objections to the use of minimum competency testing in the public schools. Dittmar (1979; quoted in Sechrest, 1981) listed a number of objections educators have to using minimum competency testing:

1. It excludes some children arbitrarily from the benefits of education and stigmatizes under-achievers.
2. It does not assure the development of effective programs of remediation for those students who fail the tests.
3. It tends to oversimplify the issue of minimal competency among graduates.

4. It causes a narrowing of curriculum as the instructional program begins to focus on specific survival skills.
5. It places an unfair burden of failure on the students.
6. It places an unfair burden of accountability on educators.
7. It encourages "teaching the test."
8. It creates maximums for the required minimums.
9. It forces students to spend hours dealing with trivia while neglecting important educational issues. (Sechrest, 1981, p. 43)

Students themselves also have negative opinions of minimum competency testing. Blau (1978) surveyed 35 students who had recently been examined in Florida's minimum competency program. His findings were as follows:

> Thirty of the thirty-five students interviewed in depth were relatively distressed and disdainful about the whole testing business. They saw it as another burden developed by adults to make their progress through school more difficult. . . .
>
> The students who failed the minimal competency test saw this result as another antagonistic "put down" from a society that does not like them very well. A number of bright students who will be admitted to college with advanced standing had almost identical views, except that they saw the tests as just another "piece of nonsense" that wastes time during high school and keeps them from productive learning. The poor students saw the tests as an additional barrier to success and esteem and not a help, while the good students saw them as a barrier to using their time effectively. (pp. 176-77)

Student Differences and Minimum Competency Testing

Also discussed in the literature is how minimum competency testing affects different groups of students. Certain basic assumptions underlying Section 504 of the Rehabilitation Act of 1973 pose some technical problems in accommodating competency testing programs to handicapped students. Two assumptions pointed out by Morrissey (1978) are that

> first, ways exist or can be developed to neutralize or account for the effects of impairments on performance; and second, equal opportunity can be assured by determining how much

> handicapped individuals are alike rather than different from their normal competitors. (p. 208)

Another issue related to student differences and minimum competency testing is the tendency for the results of the testing program to stimulate tracking, thus violating the principle of educating students in the least-restrictive environment. Cohen, Safran, and Polloway (1978) pointed out:

> During the past decade the emphasis upon the concept of the least restrictive environment has carried with it the ultimate goal to foster heterogeneous groupings and thus to affirm that children with different learning abilities, lifestyles, talents, and cultures can learn from each other when given the opportunity. A significant threat to heterogeneous learning environments exists within the M.C.T. movement.
>
> Remedial programs, sometimes known as survival schools, have been introduced as a necessary outgrowth of M.C.T. Pupils who do not initially pass the exam are placed into these programs in order to advance their achievement to an acceptable level. Therefore, a by-product of M.C.T. may be to result in the discriminatory practice of ability tracking which may inherently be biased against handicapped and minority students. (p. 251)

Also related to student differences and minimum competency testing is the fact that "minimum competency" has different meanings for different people. Danielson (1978) pointed out:

> A retarded adult's survival in a halfway house may be an appropriate level of functional competency. The notion of minimum competency implies that there are basic skills and/or competencies which are necessary for any person to possess in order to function. But the term "to function" needs clarification, and schools must grapple with the fact that competencies are not absolute, but are relative to the environment of the individual. Our society has long recognized that it contains many acceptable environments (sub-cultures). (p. 201)

The ways in which minimum competency testing must provide for student differences are not specifically stated in the literature. However, when dealing with the handicapped student, the implications

of Section 504 are clear. As Morrissey (1978) pointed out, "In a competency testing program a handicapped student must be individually accommodated" (p. 207). The actual techniques used to accommodate handicapped students are left to the discretion of the state and local educational agency.

The Individualized Educational Plan and Minimum Competency Testing

Throughout the literature, it is evident that educators and policy makers are striving for an answer on how to accommodate students with special needs. Questions continue to arise about whether educators are using minimum competency testing to the maximum benefit of teachers and students, whether there is appropriate follow-up remediation for students who fail the test, whether minimum competency testing programs really benefit special education students, and at what point in a student's career the tests should be introduced. Ravich (1978) noted, "The ultimate purpose of the test is to provide assistance to teachers and students rather than to withhold diplomas, but often the tests are administered too late in the student's career to be of much use to him" (p. 7).

Feldmesser (1980) addressed the question of follow-up remediation. He wrote, "Present alternatives for handling students who have not met minimum standards by the end of their high school education are not satisfactory. To imply other remedial instruction, when schools have not yet brought students to the point of competence, seems futile" (p. 421).

Questions concerning minimum competency testing become even more important when educators evaluate the correlation between the special education curriculum and the minimum competency testing program. These questions post major challenges to both educators and policy makers. In the literature it was pointed out that using the Individualized Educational Plan (IEP) can help educators meet some of the challenges inherent in accommodating minimum competency testing to exceptional children.

In "Competency Testing and the Exceptional Child," Swartz (1979) provided the following recommendations regarding minimum competency testing and the use of the Individualized Educational Plan.

> Based on an extensive literature review and the current perspective of the National Council for Exceptional Children, the I.C.E.C. Ad Hoc Committee on Minimal Competency Testing for Handicapped Children made the following recommendations:
>
> 1. The Individual Educational Program should be used as the determiner of competencies for handicapped children. It is believed that both the I.E.P. and the minimal competency test have a similar intent, to insure quality educational opportunity for public school children. It is also believed that the I.E.P. is the appropriate measure for the handicapped child.
> 2. Minimal competency testing should be considered an option for handicapped children when appropriate. When the handicapped child's academic success is such that taking the minimal competency test is appropriate, this should be established as a goal on the child's I.E.P. Under no circumstances should minimal competency testing become mandatory for handicapped children but rather be selected as an option on an individual basis.
> 3. Minimal competency testing must be nondiscriminatory to handicapped children. Appropriate modifications in test administration must be made to accommodate each child's handicapping condition.
> 4. Minimal competency testing should not be the criterion for determining appropriate grade placement for handicapped

children. Program decisions for the handicapped must be made on the basis of individually determined needs.

5. A regular high school diploma should be awarded to each handicapped child who completes the prescribed special education program. It is believed that only a regular diploma would be consistent with the spirit of federal and state laws regarding the handicapped. (pp. 5-6)

Legal Issues Regarding Minimum Competency Testing

Legal issues regarding minimum competency testing continue to receive a great deal of attention throughout the United States. As minimum competency testing continues to evolve into a major aspect of the educational system, legal issues will inevitably arise. McCarthy (1982) stated, "The litigation is only in its infant stage, and it seems destined to proliferate" (p. 16). McCarthy's statement is particularly true when one considers the involvement of handicapped students in the minimum competency testing program.

Handicapped students' involvement in minimum competency testing is not a new issue. The following questions reflect the major areas emphasized in the literature with regard to handicapped students' involvement in minimum competency testing:

1. To what extent does the law protect handicapped students in regard to minimum competency testing?

2. What importance do educational versus constitutional rights have for the handicapped student participating in minimum competency testing programs?

3. What legal and policy questions should be taken into account when educational agencies are involved with minimum competency testing?

The literature on these three topics of concern is presented in the following pages.

Legal Protections for Handicapped Students

The three major legal protections for handicapped students are the Fourteenth Amendment to the Constitution of the United States, Public Law 94-142 (known as the Educational of All Handicapped Children Act of 1975), and Section 504 of the Rehabilitation Act of 1973.

Fenton (1978) pointed out the relevance of constitutional rights for educators, as well as how these rights relate to testing and the handicapped:

> . . . The Supreme Court has made it clear that the behavior of educators must conform to fundamental constitutional safeguards and cannot conflict with basic constitutional rights.
>
> Two constitutional rights set forth in the Fourteenth Amendment have special relevance for school administrators contemplating how they will deal with handicapped students in their testing programs. The first right is the guarantee of equal protection of the law, construed as equal opportunity when applied to education; the second right is to due process when state action may adversely affect an individual. Both these provisions have been embodied in Public Law 94-142, the Education of All Handicapped Children Act, and are elaborated on by this legislation and its regulations. (p. 182)

The Fourteenth Amendment establishes a foundation of legal protection for all persons, whereas Public Law 94-142 and Section 504 of the Rehabilitation Act apply those requirements more specifically to handicapped persons. Public Law 94-142 and Section 504 mandate not only that each handicapped child receive a free, appropriate public education, but also that the child be afforded specific protections when being evaluated. Also, Section 504 mandates

nondiscrimination on the basis of handicap in testing situations throughout the handicapped individual's life. According to Morrissey (1978),

> These legislative initiatives are very important because they shift the emphasis from recognizing groups of handicapped persons to assuring services to the handicapped individual. Thier procedural requirements endorse anticipatory and remedial efforts, and they require that educational decisions be made on an individual basis. And finally, these laws give the handicapped person or his or her representative a direct voice in judging public efforts to serve the handicapped.
>
> Section 504 is a pervasive legislative mandate. Whereas Public Law 94-142 emphasizes specific educational provisions and safeguards for handicapped individuals, section 504 not only mandates such safeguards but requires that "no otherwise qualified handicapped individual . . . shall, solely by reason of his handicap, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance. The Congressional intent was to assure equal opportunity for each handicapped individual to obtain the same result and achieve the same level of success as those designated non-handicapped. Additionally, different or special accommodation is viewed as a viable means of meeting this intent."
>
> The implications of the section 504 mandate are clear. In a competency testing program a handicapped student must be individually accommodated. The tests must be valid. The student must have an opportunity to qualify for promotion or a diploma equal to that of his or her non-handicapped counterpart. (pp. 207-208)

Some educators feel Public Law 94-142, through the individualized educational planning requirement, protects handicapped students in minimum competency testing programs. The basic components of the Individualized Educational Plan include:

1. A statement of the present level of educational performance of such child;
2. A statement of annual goals, including short-term instructional objectives;
3. A statement of the specific special education and related services to be provided to the child, and the extent to which the child will be able to participate in regular education programs;

4. The projected dates for initiation of services and the anticipated duration of the services; and
5. Appropriate objective criteria and evaluation procedures and schedules for determining, on at least an annual basis, whether the short-term objectives are being achieved. (45 CFT 42, Federal Register, 1977, p. 42491)

Fenton (1978) pointed out that the Individualized Educational Plan is a "documented plan which employs a competency-based curriculum approach--on an individualized basis rather than with a standard set of goals" (p. 183). He went on to identify several questions that arise regarding the administrative practices that should be employed to protect the equal-opportunity rights of handicapped children participating in competency testing programs. These are:

> First, must the IEP goals and objectives reflect those of the regular educational program insofar as possible? The burden will probably be on the planning team to show cause for deleting goals and objectives known to be in the competency testing program.
>
> Second, will schools have to develop a means to demonstrate that the child actually received the instructional program outlined in the IEP with regard to the competencies addressed in the testing program?
>
> Third, will the school need to ensure that instructional omission does not occur for mainstreamed children who participate in "pull out" programs but who intend to participate in the regular competency testing program? L. C. Danielson discusses the need to ensure content validity between the tests and the child's IEP. Thus the school has the obligation to develop or modify the curriculum so that it coincides with the district's chosen competencies. (pp. 184-85)

Whereas the Individualized Educational Plan stresses the importance of individualized planning for the handicapped, Schenck and Welch (1980) pointed out the importance of equality in testing for the handicapped. "It goes without saying that if minimum competency is thought necessary for minimal participation in life for the nonhandicapped, it must have equivalent implications for the handicapped" (p. 3).

The Fourteenth Amendment, Public Law 94-142, and Section 504 establish the legal mandate for state and local educational agencies to provide handicapped students with equal educational opportunities. The literature implied that answers to future legal questions and litigation will depend on the ability of administrators to prove that their minimum competency testing programs do not violate handicapped students' legal rights.

Educational Rights Versus Constitutional Rights

The involvement of handicapped students in minimum competency testing programs poses an important accountability concern for state and local education agencies. Educational agencies must comply with educational, constitutional, and individual rights when providing a minimum competency testing program. A number of authors have distinguished among these types of rights.

In "Test Scores and Individual Rights," Kennedy (1978) stated,

> Before considering the feasibility of state-assumed responsibility . . . some determination must be made regarding whether education itself is to be considered a right of the individual to be exercised at his or her discretion or whether instead society is responsible for assuring individual accomplishments. If we assume education is a right, we must realize that the right to an education is not the constitutionally guaranteed rights such as freedom of speech or religious preference. (p. 189)

Kennedy proceeded to point out that educational rights differ from constitutional rights in three important respects:

> First, education is supported with finite public resources. Though free to the individual, education is not free to society. And that means distributive decisions regarding social resources

> must be made--decisions which need not be made for rights such as free speech. This creates a dilemma: unlike other rights, the establishment of a universal right to education must necessarily include a method of distributing resources.
>
> The second major difference between education and other rights is that the right to education cannot be exercised freely at any time or place. Rather, it must be acquired or obtained hierarchically, in a place and in a sequence prescribed by society: one must complete the requirements for one grade before one can attend the next. The use of minimum competency testing further structures the way in which an individual can exercise the right to an education. By requiring passage of a minimum competency test before grade advancement or receipt of a diploma, the test constrains individual rights of access to later educational opportunities.
>
> Third, one cannot easily determine when an individual's right to education has been exercised or when it has been denied, though one can easily determine whether an individual was allowed to vote, for example, or to speak freely. (p. 189)

Recent court cases have dealt with the question of whether individuals were provided their right to an education. Kennedy cited the following example:

> In Brown v. the Board of Education (1954), the concern was not merely for equality of opportunity, but instead it was for effective equality. That is, the evidence of equal rights to education must be found in the outcomes of education rather than simply in the provisions of education. This point of view can be found in at least one social scientist's attempt to measure equal opportunity, where the measure of equality has in fact been a measure of equality of educational outcomes, or at least equality of outcomes across major segments of our population.
>
> But extending the measurement of equality to include the outcomes of education means that education as a right now has a considerably different status than constitutional rights. To re-define freedom of speech to mean effective free speech, for example, would mean that someone must listen to every individual's speech. Clearly no guarantee of effective free speech is possible. Equal opportunity for free speech, however, can be guaranteed by requirements such as equal time on public broadcasts. (pp. 190-91)

When considering the results of minimum competency testing as evidence of whether equal educational opportunities have been provided, many questions begin to surface. For example, can a minimum competency

test contain the true minimum requirements of a diverse society? If an individual does not pass the minimum competency test, who is responsible for correcting or improving the deficiencies?

Some individuals feel the burden of passing rests on the individual, whereas others assert that "it is society which must assure that an effective education has been acquired" (Kennedy, 1978, p. 191). Yet, it is difficult to ascribe failure to either the educator or the individual, since their interaction is so complex. What is needed is a set of performance standards for society that can (a) assure that society is providing every opportunity to all individuals, yet (b) recognize that different individuals will graduate with different competencies, and (c) assure that individuals are not penalized for society's failures to meet its own standards.

To ensure the protection of students' rights, allowing for individual differences is of utmost importance in developing minimum competency tests. Educators and policy makers must also ensure that the use of test results is monitored so that the rights of the individual are not violated. Using test results to retain, trace, or deprive a student of graduation is a major issue concerning individual rights and minimum competency testing.

Kennedy (1978) pointed out that many educators feel minimum competency testing is the answer to society's responsibility of assuring universality of minimum competencies. She stated, however, that the tests fail for three important reasons:

> First, these tests cannot accommodate legitimate variations among individual aspirations and abilities. Second, where these variations may lead to test failures, the extent of individual versus

> school responsibilities for failure has not been clearly defined. Third, tests for minimum competencies seem to be based on the assumption that education is an entity that can be "given" to individuals by society. In fact, education is a process; it occurs over time through the interaction between the individual and the educator. (pp. 197-98)

The purpose of minimum competency testing, the structure of the test itself, and responsibility for individual rights on the minimum competency test raise many legal questions. The results of minimum competency testing affect the student's future educational and/or vocational opportunities. When minimum competency testing outcomes are viewed as indicators of equal educational opportunity, people designing the test must ensure that the diversity of the society is taken into account and that no person's educational, constitutional, or individual rights are violated. The question of whether this task can be accomplished may ultimately be answered by the courts.

Other Legal and Policy Questions Regarding Minimum Competency Testing

In addition to the legal issues surrounding minimum competency testing that have already been discussed, the following six areas of concern raise further legal and policy questions about the use of minimum competency tests:

1. the potential for racial discrimination;
2. inadequate advance notice and phase-in period prior to the initial use of the tests;
3. possible lack of psychometric validity or reliability of the tests;
4. inadequate match between the instructional program and the test;
5. inadequate remedial instruction that creates or reinforces tracking; and
6. unfair apportionment of responsibility for test failures between students and educators. (McClung & Pullin, 1978, p. 922)

Because these six issues apply to the entire student population, they have important implications when considering the involvement of handicapped students in minimum competency testing.

Racial discrimination.--The potential for racial discrimination can be further expanded to include the unfair treatment of all minority groups. This legal and/or policy question would then pertain to all those individuals who are not part of the majority and who have been or could possibly be discriminated against in testing programs. Court decisions have shown that handicapped students are considered a minority group and need protection from past discrimination. Swartz (1979) stated,

> As a case in point, in McNeal v. Tate Co. School District, 508 Federal 2d 1017 (5th cir. 1975) . . . the Appeals Court overturned the district court and disallowed a testing program that could cause further segregation of students by either race or intelligence. Also the landmark case of Diana v. State Board of Education of California, C.A. No. 3-379 RFP (N.D. Cal. Jan. 7, 1970 and June 18, 1973) safeguarded the rights of minority students from being placed into programs for the retarded on the basis of a single test. Minimum competency testing cannot be construed as a multi-factored evaluation which is prescribed in P.L. 94-142. (p. 9)

Section 504 of the Rehabilitation Act of 1973 offers a general guarantee of equal-rights protection for the handicapped. It reads:

> No otherwise qualified handicapped individual in the United States . . . shall, solely by reason of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. (45 C.F.R. §§ 81 and 84)

McClung and Pullin (1978) pointed out that "there are federal regulations that have been established to protect the rights of handicapped students, but to this point the courts have done very little

in providing specific guidance regarding competency testing of handicapped students" (p. 926). The authors noted that there is no simple answer to accommodating handicapped students in competency testing and that some of those students "may be subject to discrimination if they are excluded from participation in or denied the benefits of the same competency program that is provided to nonhandicapped students" (p. 926). In addition, they pointed out that

> Other handicapped students may be discriminated against and denied the benefits of the program unless different standards and assessment procedures are provided, and that the potential conflict between the federal statutory presumption:
> 1. that handicapped students should be integrated into the regular educational program to the maximum extent appropriate, and
> 2. that to provide equal treatment to persons with unequal needs is unfair in some circumstances,
>
> probably cannot be resolved without individualized determinations. The underscored language in these presumptions also indicates that individual determinations are in order. (p. 926)

The policies established to protect the rights of handicapped persons are based on individual need and do not lend themselves to uniformity. "What is fair for one handicapped student may be unfair for another because individual circumstances vary so greatly" (McClung & Pullin, 1978, p. 926).

Advance notice and phase-in periods.--The issue of inadequate advance notice and phase-in periods before the initial use of competency tests has become a major area of concern for those students being required to pass the minimum competency test before receiving a diploma. According to the literature, the legal question is whether the student's due process rights under the U.S. Constitution are

violated if the student is not given sufficient notice that he/she must pass a minimum competency test to receive a diploma.

Fenton (1978) stated,

> Public Law 94-142 requires that the development and review of a handicapped child's IEP [individualized educational plan) be governed by due process procedures patterned after the judicial model. This model emphasizes the following elements: notice of pending action; informed consent; and the opportunity for resolution of conflicts through informal means and the right to formal appeal and an impartial hearing. (pp. 185-86)

He proceeded to say that school competency programs must deal with the following questions in order to ensure the student's due process rights.

> First, what provisions does the school make for informing parents and the child, when appropriate, that the contents of the IEP will determine the child's eligibility or preparation for the competency testing program? Furthermore, does the school make available to the parents (and the child) a list of the competencies included in the testing program so parents can judge the relationship between the program and their child's IEP? And third, are parents advised about the implications for their child's future educational opportunities and employment prospects if the IEP does not address the district's competencies? (p. 186)

A question arises when an educational agency follows the due process procedures pertaining to minimum competency testing and the handicapped student:

> Does the school have policies or procedures to promote informal resolution of conflicts when parents and schools disagree on which competencies are appropriate for a special education student? Is there a mechanism whereby parents or the child can appeal and receive an impartial hearing relative to participation in the competency testing? (Fenton, 1978, p. 186)

Without question, advance notice and appropriate phase-in time of minimum competency testing are important for all students, including the handicapped. The "Minimum Competencies and the Handicapped"

guidelines booklet published by the Virginia Department of Education (1980) supports this idea in the section on "Preparing the Student": "Handicapped students must be adequately prepared to take the Minimum Competency Tests. The period of preparation is long term: from Kindergarten to the actual testing of the students' competencies" (p. 6).

Psychometric validity and reliability.--The possible lack of psychometric validity and reliability must be considered in any type of achievement test. When contemplating the involvement of special education students in minimum competency testing, one must realize the uniquenesses of various disability groups and the effect of these differences on the validity and reliability of the test. In using the hearing impaired as an example, Jensema (1980) highlighted the importance of this point:

> Most of the tests used in educational programs for the hearing impaired were originally developed for students with normal hearing. Since the reliability and validity of a test does not necessarily hold for any population other than the one for which it was developed, these measures must be considered carefully in regard to hearing-impaired students. In general, a test which was developed for normal-hearing students will have lower reliability and validity for hearing-impaired students. How much lower is a question which can only be answered through extensive collection and analysis of test data. (p. 497)

Match between the instructional program and the test.--The issue of inadequate match between the instructional program and the test is receiving a great deal of legal attention. Cohen, Safran, and Polloway (1980) raised an important question in this regard:

> Is it legal to test a child in an unfamiliar manner on material that might not have been taught, and on the basis of such an exam deny a high school diploma? For now the tests generally appear to be poorly matched to special education curricula. (p. 251)

Another legal question involves the amount and type of evidence of match between tests and instruction that is needed to satisfy a judge. "A lenient judge could accept teacher testimony or could accept evidence of homework and materials used in class," wrote McClung. But he cautioned that "districts should be able to document 'in some objective way' what is happening in the classroom" (in Neill, 1979, p. 453).

> McClung (1978) pointed out that schools might be legally bound to demonstrate that tests have curricular and instructional validity. Curricular validity represents the match between the test and goals, while instructional validity indicates the match between the tests and instruction. If instruction does not proceed from the goals upon which the test is based, the test may have curricular validity but lack instructional validity. Whether viewed legally or ethically, the content validity of these tests cannot be ignored. Competency tests should be based upon educational goals and the instruction which proceeds from those goals. (Danielson, 1978, pp. 201-202)

The legal questions regarding test content and curriculum validity are still being reviewed in the courts. The schools will have to defend the instructional and curricular validity of their minimum competency tests, especially if a student must pass such a test before being granted a diploma. A prime example is a case in Illinois in which "handicapped students have sought both their diplomas and $1 million in damages, claiming that their special education classes did not cover the material that was included on the high school 'exit' test" (Sevene, 1982, p. 16).

Remedial instruction reinforcing tracking.--The concept of tracking has received a great deal of attention over the past several years. Inadequate remedial instruction that creates or reinforces

tracking could be a result of minimum competency testing. According to Swartz (1979),

> If minimal competency testing is to be used for grade placement and promotion, the end result could be the emergence of tracking programs. Students could be eliminated or "counseled" into programs that would not include the necessary courses, requirements and programs leading to a high school diploma. Tracking systems for placement of minority and poor students was successfully litigated in Hobson v. Hanson, 369 F. Supp. 401, 514 (DDC 1969) by application of the equal protection clauses and (by implication) rights to education clauses under the 14th Amendment. Any testing, including minimal competency testing, that tracked students into different programs or that caused them to receive different educational benefits would appear to be illegal under this precedent. (pp. 7-8)

Responsibility for test failures.--Who is responsible for correcting students' failures on the minimum competency test? Is there an unfair apportionment of responsibility for test failures between students and educators? The courts are sometimes involved in determining who is accountable when an individual does not accomplish a minimal level of competency. It is sometimes assumed that any student participating in the United States educational system can attain minimal competency. If it is possible to establish a "universally requisite" minimum competency test that ensures the individual rights of all students involved, the courts may need to determine who is responsible if a student does not pass the test.

Currently, educators concur that the student and his/her family, as well as the school, should be concerned about the student failing the minimum competency test. Ebel (1978) wrote:

> It should be recognized that finding a solution to the problem of failure is not the exclusive responsibility of the school. The pupil is most directly affected, and he and his family should be most deeply concerned. The pupil can do more than

> anyone else to achieve success. Learning cannot be imposed. It must be pursued, even by the youngest pupil. The best a school or a teacher can do is provide opportunities for learning and create conditions that make learning attractive. (p. 548)

Blau (1978) espoused a different point of view. He asserted,

> In the issue of minimum competency testing, the student is again the "victim." Under the guise of "helping" the victim, it is necessary to examine the victim carefully, scientifically, objectively, mathematically, and so forth. The purpose is to confine the solution of the dilemma to manipulations of the victim. By concentrating all effort on the victim, it is possible to displace, ignore, and ultimately avoid the basic social causes of the problems being addressed. The most important subtle effect of this ideological process is that when one concentrates on the victim, one can avoid passing judgements on one's own adequacy. To concentrate on the inadequacies of our students in the school system is to sanctimoniously imply a "not guilty" verdict for ourselves. Genuine and pragmatic concern for the welfare of our students might better be demonstrated by carefully designed evaluation plans to answer questions about the relationship of schooling to quality of life and to personal success five, ten, and twenty-five years after graduation. (p. 175)

Because education is a complex process, it is difficult to ascribe failures to either the educator or the individual student. As Kennedy (1978) pointed out:

> The assumption behind the use of competency tests is that educational outcomes can be guaranteed. But since education is an interactive process, such guarantees may not be possible. In fact, it is even difficult to ascribe failures to either the educator or the individual, since their interaction is so complex. (p. 198)

In summary, the legal implications concerning minimum competency testing and the handicapped are continuing to unfold and are very complex. There seems to be no specific answer to how educators, parents, and policy makers can guarantee an appropriate minimum competency program for handicapped students. However, much of the literature favored McClung and Pullin's (1978) position that:

> It is hard to make any generalized statement about the legality of competency testing of handicapped students except that individual needs and circumstances are likely to be a key concern. The courts traditionally stress individual cases and specific factual situations as much as possible, and reach different results accordingly. Therefore, we think that if parents and policy makers decide to apply competency testing programs to handicapped students, they would be well advised to avoid any uniform approach for all handicapped children, and to consider instead an approach based upon individual determinations. (p. 927)

Inclusion of Special Education Students in Minimum Competency Testing

Through the minimum competency testing program, public schools have attempted to respond to society's demand for greater educational accountability. This challenge becomes more complex when educators contemplate involving handicapped students in minimum competency testing. Because 11 categories of handicapping conditions are defined in Public Law 94-142 and each of those categories is unique, educators must consider several factors when they contemplate involving handicapped students in minimum competency testing. Some of these factors are:

> the inclusiveness of the phrase handicapped students, heterogeneity within each category of handicap, widely varying curriculum and instructional goals specific to handicapped individuals, and the purpose of competency testing. (Ewing & Smith, 1981, p. 523)

These factors necessitate testing considerations to accommodate the special needs of handicapped students. "One cannot assume the minimum competency programs designed for non-handicapped students are appropriate for handicapped students" (Rosewater, 1979, p. 1).

In determining the categories of special education students for whom the minimum competency testing program is most appropriate, Ewing and Smith (1981) suggested that:

> . . . it would be helpful to conceptualize these students into two basic groups:
>
> 1. handicapped students who require a modification of the learning environment
> 2. handicapped students who require a modified curriculum and instructional goals. (p. 523)

Ewing and Smith further suggested that for handicapped students who basically require a modification of the learning environment, the curriculum and instructional goals are essentially the same as those for nonhandicapped students. The same competency test and proficiency standards required of nonhandicapped students could be used with equity in making decisions about high school graduation or grade promotion for these students. There might be a need to modify the assessment procedures, depending on the nature of the handicapping condition (i.e., visual impairment).

For handicapped students who require a modified curriculum and instructional goals, the educational program often differs noticeably from that of their nonhandicapped peers. These handicapped students are generally characterized by lower achievement potential, and their instructional goals focus on lower levels of skill development. Modified educational programs are likely to result in an inadequate match between the handicapped student's program of instruction and the level of item difficulty on the competency tests. When educational-program discrepancies exist, competency tests should not be applied equally to handicapped and nonhandicapped students. One possible approach to dealing with the problem would be to use the competency test developed for nonhandicapped students but to establish different proficiency requirements for individual handicapped students.

The educational program for students with severe and profound handicaps is so vastly different from that of their nonhandicapped peers that the students cannot begin to develop the skills needed to participate in the regular competency testing program. Total exemption from competency test requirements is appropriate for these students (Ewing & Smith, 1981, p. 523).

When considering whether to include handicapped students in minimum competency testing, it is important to consider the purpose of such testing. A 1982 issue of Education Week contained a report on "How Minimum-Competency Tests Are Used in 35 States." From the findings of this report, it is evident that a majority of the states use minimum competency testing for remediation, instructional improvement, promotion, and high school graduation (p. 7). In particular, the Michigan Department of Education (1982) described the purpose of the Michigan Educational Assessment Program as "to allow local educators to identify which students have acquired basic skills and assess the strengths and weaknesses of their basic skills programs" (Introduction).

Much of the literature reflected the notion that, both legally and ethically, minimum competency testing programs used with handicapped students, whether for remediation, instructional improvement, promotion, or a graduation requirement, must respect the individual handicapped student's needs and that test results should not be used to the detriment of the student. Thus professionals must use the appropriate accommodations in the minimum competency testing program

to allow handicapped students to participate in the testing without their individual rights being violated.

Special Accommodations Available for Handicapped Students in Minimum Competency Testing Programs

The movement to involve handicapped students in minimum competency testing has caused policy makers and educators throughout the United States to review and implement special testing arrangements to accommodate students with unique needs. The variety of these arrangements becomes evident when one reviews the minimum competency testing provisions of Michigan, New Jersey, and Virginia.

Michigan's educational assessment program test has an edition available in Braille or large print for students who need such adaptations. The Michigan State Board of Education also provides special test settings, as described in the following quotation:

> If a student who is receiving services in a Special Education Program is to be tested, she/he may be tested by the special education teacher in that classroom to minimize the effects of testing. While attempting to maintain a standard procedure for test administration, the length and scheduling of test sessions may be adapted to the needs of individual students. (Michigan State Board of Education, 1982-83, p. 5)

Johnson (n.d.) described the special minimum competency testing provisions for handicapped students in New Jersey:

> New Jersey has three supports available to accommodate handicapped students in their minimum basic skills testing program. These are: the availability of a variety of test administration procedures; a Braille and large-print version of the test; and a modified test at the third and sixth grades to accommodate certain auditorily handicapped students. (p. 3)

Specific accommodations for handicapped students, as outlined in "The New Jersey Minimum Basic Skills Testing Program: Accommodating Handicapped Pupils" (Johnson, n.d.), are listed below.

Suggested Modifications

When testing a student classified as handicapped, any of the modifications listed below may be used. The decision as to which ones should be used will be determined by the student's needs.

1. The student may be tested in his/her regular classroom; very few changes can be implemented in this setting without disrupting the rest of the class. Therefore, the more modifications needed, the more likely that the student should be tested in a separate setting.
2. The student may be tested in a resource room, alone, or with other students classified as handicapped who need the same type of administration changes.
3. The student may be tested individually. If he/she needs administrative adaptations this setting would be best. If at all possible, the Examiner should be someone who is familiar with the student.
4. Identifying Information and General Information questions may be gridded by the Examiner in advance.
5. If the student cannot transfer the answer to the answer sheet, he/she may record the answers in the test booklet. (In all cases when the student does not answer on the computer answer sheet, the Examiner will be responsible for entering the student's answers on the answer sheet.)
6. The student may answer the questions orally, if he/she normally uses this response mode to answer test questions in the classroom. (In all cases when the student does not answer on the computer answer sheet, the Examiner will be responsible for entering the student's answers on the answer sheet.)
7. The student may use a communication device if he/she usually uses the device to communicate in the classroom (an abacus or calculator cannot be used). This should be determined before testing so that necessary devices will be in working order and available. (In all cases when the student does not answer on the computer answer sheet, the Examiner will be responsible for entering the student's answers on the answer sheet.)
8. If a student cannot use a #2 pencil, he/she may use a thicker pencil.
9. Examiners may repeat directions or re-explain examples if not understood.
10. Examiners may reword directions for clarity as long as the rewording does not change the nature or intent of the item.

11. All directions written in the test may be read to the student. Under no circumstances should items, passages, or actual test sections be read to the student.
12. Sessions may be extended beyond suggested time limits. This is a power test, not a speed test. Time segments should be regulated to accommodate the student; giving parts of sections or providing frequent breaks are acceptable procedures. A student should not be penalized because of stringent time limits.
13. Students may use a mask (paper used to cover parts of the test) to block off an item or to mark their place on the test.
14. Students may be given a practice test one or two weeks before actual testing. Practice tests will familiarize the student with test-taking techniques.

Suggested Guidelines for Administering MBS Tests to Auditorily Handicapped Students

A few auditorily handicapped students may be able to take the standard MBS Tests in a regular setting and so not require adaptations in testing procedures. Others with more severe problems may need many administration modifications.

In addition to the general modifications listed above, specific adaptations which may be implemented to accommodate auditorily handicapped students are described below. These modifications do not have to be used. The examiner should decide which ones are necessary according to the student's needs.

Modifications for Regular Classroom Setting Administration

The modifications used in this section are appropriate for some auditorily handicapped students, especially those who do not have severe problems and are able to take the test in a regular classroom. Very few adjustments can be made in this setting; therefore, if you feel that a student cannot be tested with these minimal modifications, the student should be tested in a different setting, either on a one-to-one basis or with other auditorily handicapped students who will be tested with similar test administration modifications.

If an auditorily handicapped student is tested in a regular setting, the following administration modifications are the only ones which may be implemented:

1. The student may read all dictated instructions. Students may have a typed sheet containing all directions read by the Examiner. Thus, the student can read directions after or as the Examiner dictates them.
2. The student should be seated in a section of the classroom where he/she will not be distracted. The student should be able to see the Examiner clearly and concentrate on the test items without distraction.

3. All hearing devices normally used by the student (hearing aid) should be checked; batteries should be working. The device should not interfere with test-taking process.
4. The Examiner may signal visually when it is time to stop by flashing lights in the room or giving a hand signal to the student.

Special Setting Modifications for Auditorily Handicapped Students

A special setting can be a resource room or classroom where the student is tested on a one-to-one basis or with other auditorily handicapped students who will be tested using similar test administration modifications. When the auditorily handicapped student is tested in a special setting, all modifications discussed in previous sections plus the adjustments listed below may be used:

1. All directions read by the Examiner may be printed on a sheet or placed on a transparency (overhead transparencies will be in large print). In this manner the student can read everything the teacher dictates. The mode of written directions (transparency or printed sheet) should be determined prior to testing.
2. The Examiner should be familiar with students. A teacher or guidance counselor who knows the students or has taught the students should administer the test.

Modified Tests

Braille and large-print third, sixth, ninth, and eleventh grade Reading and Mathematics Tests and auditorily handicapped third and sixth grade modified Mathematics tests are available upon request through the New Jersey Commission for the Blind. (pp. 1-3)

Virginia's minimum competency test accommodations for handicapped students, as outlined in "Minimum Competencies and the Handicapped" (Department of Education, Commonwealth of Virginia, 1980), are categorized into five major areas: scheduling modifications, setting modifications, format and/or equipment modifications, recording modifications, and modality modifications. A description of Virginia's minimum competency testing accommodations for handicapped students follows.

MINIMUM COMPETENCY TEST ACCOMMODATIONS FOR HANDICAPPED STUDENTS
(Department of Education, Commonwealth of Virginia, 1980)

Accommodations	EMR	TMR	V.I.	H.I.	L.D.	S.I.	E.D.	O.I.	OHI	M.H.
A. Scheduling Modifications: Tests will be administered:										
1. at time of day most beneficial to student.	X	X	X	X	X		X	X	X	
2. in period of ___ minutes followed by rest breaks of ___ minutes.			[X OR]		X		X	[X OR]	[X OR]	
3. until, in administrator's judgement, student can no longer sustain the activity due to physical disability or limited attention span.	X	X	[X]		X		X	[X]	[X]	
B. Setting Modifications: Tests will be administered:										
1. in a small group.			[X		X		X			
2. in a carrel.			OR		X		X			
3. in the special education classroom.	X	X	X]		X		[X	[X	[X	
4. at child's home.							OR X]	OR X]	OR X]	
5. with child seated in front of classroom.				X						
6. with teacher facing child.				X						
7. by student's special education teacher.	X	X	X	X	X		X	X		
8. using an interpreter during the time oral instruction is given to the student(s).				X						
C. Format and/or Equipment Modifications: Tests will be administered:										
1. in large print.			X		X					
2. in Braille.			[X							
3. with child using magnifying equipment.			OR X]							
4. with child wearing noise buffers.										
5. using templates and/or graph paper.		X								

Accommodations	EMR	TRM	V.I.	H.I.	L.D.	S.I.	E.D.	O.I.	OHI	M.H.
D. Recording Modifications:										
1. Child will mark answers in test booklets.	X		[X OR X]		[X OR X]			X		
2. Child's answers will be recorded by proctor or assistant.		X						[X OR X]		X
3. Child will mark answers by machine.										
E. Modality Modifications:										
1. Math test only will be read to child by proctor or via audio cassette.			X		X					
2. Reading test will be administered orally to students with severe psychomotor impairments, visual impairments, or learning disabilities which prevent them from reading the test.*			X		X					

NOTE: Any of the modifications listed above, except the modality modification for the reading test (E-2), can be considered and added for an individual child. Accommodations should take into account such things as secondary handicapping conditions.

*Accommodation E-2 is allowed under certain conditions and with approval of The Department of Education.

SYMBOLS:
- EMR - Educable Mentally Retarded
- TMR - Trainable Mentally Retarded
- V.I. - Visually Impaired
- H.I. - Hearing Impaired
- L.D. - Learning Disabled
- S.I. - Speech Impaired
- E.D. - Emotionally Disturbed
- O.I. - Orthopedically Impaired
- O.H.I. - Other Health Impaired
- M.H. - Multiple Handicapped

Administering the Reading Test Orally

> Under certain conditions the reading test may be administered orally, including the use of audio cassettes, to students who cannot read the tests because of problems in visual modality. The following conditions must be met:
>
> 1. The decision to administer the tests orally should be preceded by counseling with the students and parents.
> 2. The student must first have attempted to pass the regular printed test or the large-print Braille editions.
> 3. A copy of the student's IEP must be submitted to the Department of Education by the local school division. The IEP will be reviewed and the request for oral administration will be approved or denied.
> 4. The student's permanent record and any other school documents which contain the competency test scores must clearly state that the reading test was a measure of the student's ability to process information read to him/her and not a measure of ability to decode printed symbols. (pp. 9-11)

The accommodations currently being used to include handicapped students in minimum competency testing programs must continually be reviewed for appropriateness. Morrissey (1978) noted:

> We need interim and long-term strategies for accommodating handicapped students, particularly with the rapid expansion of competency testing programs. Four interim guidelines seem the most practicable. First, ask the handicapped individual before deciding on the nature and extent of accommodation. Second, decide any accommodations on a case-by-case basis. Third, do not use a test score as the sole criterion for deciding promotion or graduation. Fourth, document why and how accommodation occurred for each handicapped student. (pp. 209-10)

The literature on test administration echoed many of the concerns voiced by educators and policy makers concerning the use of appropriate criteria for the inclusion of handicapped students in minimum competency testing programs. State departments of education have attempted to provide suitable accommodations for handicapped students within their testing programs. The questions of whether there is one correct set of criteria for including handicapped students in minimum competency

testing or whether one approach is better than another do not seem to have been answered in the literature. Most writers were consistent in expressing the belief that the individualized educational plan, as outlined in Public Law 94-142, used in conjunction with minimum competency testing programs, seems to be a compatible link which would assure state and local agencies that the individual rights of handicapped students are being protected. Schenck and Welch (1980) described how the individualized educational plan fulfills this linkage role:

> If the handicapped are to be included in the minimum competency movement, the I.E.P. must be utilized as the vehicle which connects minimum competencies with instruction and assessment. The I.E.P. should delineate
>
> 1. competencies the student is to attain proficiency in,
> 2. the level of proficiency to be expected, and
> 3. specifications of any alternative instructional/testing strategies.
>
> Reference to those competencies the student is not expected to attain, and why, should also be contained in the I.E.P. (p. 5)

Summary

The literature review concentrated on three major topic areas that were most reflective of the available literature on handicapped students and minimum competency testing. These subjects were:

1. a general review of minimum competency testing
2. legal issues regarding minimum competency testing and the handicapped
3. inclusion of special education students in minimum competency testing.

The literature pertaining to minimum competency testing and the handicapped centered on educators and policy makers respecting the special needs of handicapped students in regard to minimum competency testing and providing the appropriate accommodations to allow handicapped students the maximum benefit of the testing program. The vast majority of the literature was geared to the testing of high school students, particularly in relation to passing minimum competency tests as a graduation requirement.

CHAPTER III

RESEARCH METHODOLOGY

Introduction

The primary purpose of this study was to investigate the appropriateness of existing criteria for the inclusion of special education students in the MEAP test. Differences among fourth-grade students from seven special education impairment groups, relative to their reading and math scores on the MEAP test, were examined. Several types of information were analyzed in the study: the percentage of math and reading instruction in special education received by the students, data on special education students normally included in and excluded from the MEAP test, and MEAP proctors' judgment regarding the appropriateness of the test mechanics for the special education students included in the present study.

The research methodology of the study is explained in this chapter. The sample-selection techniques are described, and the research hypotheses are stated. The instrumentation and data-collection procedures are discussed, together with the statistical techniques employed in analyzing the data.

Description of the Sample

The study was conducted with fourth-grade educable mentally impaired (EMI), speech and language impaired (SLI), emotionally

impaired (EI), physically or otherwise health impaired (POHI), visually impaired (VI), learning disabled (LD), and hearing impaired (HI) students who qualified for special education services through the individualized educational planning committee process and met the state criteria for eligibility in their primary impairment. The students were selected from a sample of 97 school districts randomly chosen by a systematic stratification method from Michigan's 530 K-12 school districts. A detailed description of the stratification procedure may be found in Appendix A, together with a list of the 97 school districts chosen for this study and the letter sent to the superintendents and MEAP assessment coordinators of those districts participating in the study.

The MEAP assessment coordinators were also invited to a MEAP preparation inservice session that provided them with information relating to their participation in the study. The MEAP coordinators were then responsible for arranging for all of their fourth-grade special education students in the selected impairment categories to participate in the study.

Two deviations from a complete random-sampling procedure occurred: First, because of the size of the eight Detroit regions, they were considered as eight school districts. The second deviation concerned the Upper Peninsula, where one school district from each intermediate school district was chosen. These deviations were based on the need for proportionate representation of special education students throughout Michigan.

Table 3.1 shows the distribution of participating students within each special education category, along with the total number of fourth-grade special education students in each category in the state of Michigan.

Table 3.1.--Distribution of participating students according to special education category (fourth-grade level only).

Category	Number of Participating Students	Total Number of Students in Michigan
Educable mentally impaired (EMI)	82	1,174
Speech and language impaired (SLI)	31	3,457
Emotionally impaired (EI)	138	1,554
Physically or otherwise health impaired (POHI)	10	281
Visually impaired (VI)	4	62
Learning disabled (LD)	475	5,036
Hearing impaired (HI)	11	176

In looking at the table, it is apparent that having an adequate sample within every special education impairment group was relinquished in favor of obtaining a systematic representation of Michigan school districts. Such a trade-off was necessary to ensure generalizability of the study findings. The SLI category contained fewer participants than would be expected. It is difficult to explain this, but one might speculate that due to the almost complete integration of SLI students into the general education program, districts may not typically consider them as special education students. However, one cannot be sure of the validity of this explanation. It should also be

pointed out that due to the cognitive functioning of educable mentally impaired students, their ages at the fourth-grade level may vary to a greater extent than those of their special and general education peers.

Instrumentation

The instrument used for this study was the Michigan Educational Assessment Program (MEAP) test. The MEAP test is an objective-referenced instrument initiated by the State Board of Education, supported by the governor, and funded by the legislature--initially through enactment of Act 307 of the Public Acts of 1969 and subsequently through Act 38 of the Public Acts of 1970. Although the information provided by the assessment program serves a variety of purposes, the program was created to provide information on the status and progress of Michigan's basic-skills education. The results are intended to show whether students are learning identified basic skills in reading and mathematics and whether more students are acquiring such information each year. In addition to measuring mastery of basic reading and mathematics skills, the MEAP test also measures attainment of objectives in other essential skill areas, e.g., science, health, physical education, social studies, art, and music.

The state of Michigan has conducted an analysis of the internal consistency of the MEAP tests, using Kuder-Richardson formula #20 (KR-20). A distribution of KR-20 reliability coefficients can be found in Volume II of the MEAP Technical Report.[1]

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[1]Available from MEAP, P.O. Box 30008, Lansing, MI 48909.

The validity of the MEAP instruments depends primarily on the adequacy with which test items sample the behavior specified by the objective. The MEAP tests are not designed to predict something else or to find substitute measures, but rather to measure directly student mastery of a given objective. The test must be an adequate measure of what it is supposed to measure. The test itself is the criterion of performance.

The content validity of current MEAP tests is based on critical judgments. The Michigan Department of Education has gathered judgmental data from teachers, curriculum specialists, measurement specialists, and others involved in both the development and the revision of the minimal-skills objectives and in the construction of test items to measure attainment of the skills.

MEAP tests are administered in grades 4, 7, and 10, which were selected as appropriate points at which to assess student performance because they represent important transition times in a student's education: completion of primary education, completion of elementary education, and completion of middle-school education. Although students are tested upon entering grades 4, 7, and 10, the skills tested should have been acquired in the previous grades (K-3, 4-6, and 7-9, respectively).

The Michigan Department of Education has done a great deal of planning and preparation to implement and maintain the focus of the Michigan Educational Assessment Program. To communicate these efforts, the Department of Education has produced a Technical Report that contains valuable information on the history and technical

dimensions of the Michigan Educational Assessment Program (MDE, 1982).

The data for the present study were based on information gathered from administration of the MEAP test to handicapped students at the fourth-grade level only. The specific section on the MEAP test answer sheet that was used to gather special-education-student data for this study is shown in Figure 3.1. (A detailed description of the administration procedures followed in this study is found in the Assessment Administration Manual in Appendix B. The complete MEAP answer sheet is shown in Appendix D.)

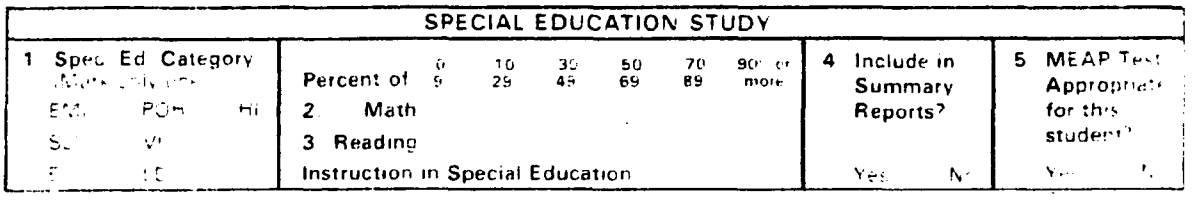


Figure 3.1.--Portion of the MEAP test answer sheet pertaining to the special education study.

School districts selected for this study were asked to respond to the five questions included on the MEAP answer sheet (Figure 3.1) for each of the fourth-grade special education students they served. An explanation of the information requested for each question is given below.

Question 1. "Special Ed. Category"--School personnel were asked to indicate the student's primary special education impairment.

Question 2. "Percent of Math Instruction in Special Education"--School personnel were asked to indicate the percentage of the student's math instruction per week in special education.

Question 3. "Percent of Reading Instruction in Special Education"--School personnel were asked to indicate the percentage of the student's reading instruction per week in special education.

Question 4. "Include in Summary Reports"--School personnel were asked to respond "Yes" if the student received more than 50% of his/her reading/English instruction in general education and thus his/her MEAP scores would be included in the MEAP Summary Report. A "No" response meant the student received more than 50% of his/her reading/English instruction in special education and thus his/her MEAP scores would be excluded from the MEAP Summary Report.

Question 5. "MEAP Test Appropriate for this student?"--The MEAP proctors were asked to respond "Yes" if, through their observation, the test procedures seemed appropriate for the student. In other words, could the student handle the separate answer sheet and test booklet and take the test as designed, read test directions, work alone, and mark answers on the answer sheet without skipping or double marking? The MEAP proctors were requested to mark "No" if the student did not seem able to handle the mechanics of the MEAP test as described above. This question was included because a purpose of this study was to investigate whether a person supervising the MEAP test could recognize observable behaviors that evidenced student frustration in the test-taking process.

Data-Collection Procedures

The MEAP test was conducted throughout Michigan during a four-week period from September 13 through October 8, 1982. The testing schedule was as follows:

Testing: September 13 - October 1, 1982

Make-ups: October 4 - October 8, 1982

Special provisions were made for districts that did not begin school on time because of teacher strikes, financial conditions, or other reasons. These districts began testing within three weeks of opening and completed testing within two weeks.

After the MEAP tests had been administered and the answer sheets completed, the Intran Corporation provided a separate special-education-student participation list with a compilation of the study data.

Research Hypotheses

The following hypotheses, stated in the null form, were formulated to answer the research questions posed in Chapter I.

Ho 1: There is no significant difference in mean MEAP reading scores between different impairment groups.

Ho 2: There is no significant difference in mean MEAP math scores between different impairment groups.

Ho 3: There is no significant difference in mean MEAP reading scores of special education students in each impairment classification receiving different percentages of math and reading instruction in special education.

Ho 4: There is no significant difference in mean MEAP math scores of special education students in each impairment classification receiving different percentages of math and reading instruction in special education.

Ho 5: There is no significant difference in mean MEAP math and reading scores of students for whom the mechanics of the MEAP test were judged appropriate and students for whom the mechanics of the MEAP test were judged not appropriate.

Statistical Methods

The data gathered in this study were analyzed and statistical hypotheses tested through a series of one-way and multivariate analyses of variance and t-tests. The independent variables were the seven special education impairment groups, the percentage of reading and math instruction in special education, and the MEAP test proctors' judgments of the mechanics of the MEAP test being appropriate or not appropriate for the student. The dependent variables were the MEAP reading and math scores. F-ratios with an alpha level of .05 were accepted as statistically significant for this study. Planned comparisons were used to examine relationships among levels of independent variables. Again, a .05 alpha level was used for judging significance.

Analysis of variance was used because the investigator was most interested in identifying the differences among the MEAP math and/or reading scores of the seven impairment groups and of students receiving different percentages of math and/or reading instruction in special education, rather than attempting to identify all of the factors that account for variances in MEAP reading and math scores. Analysis of variance also provided information about interaction of factors that was useful in suggesting alternate criteria or supporting the present criteria for including special education students in the MEAP testing.

Certain factors regarding the make-up of the student sample determined the types of comparisons that could be made. These factors are as follows:

1. Comparisons could not be made among special education students from the seven impairment groups receiving 0-49% versus 50-100% of their reading or math instruction in special education because of the unequal cell distributions of students. Tables 4.3 and 4.4 contain specific information on the percentage of special education instruction students received in math and reading, respectively.

2. Comparisons within special education categories for students receiving 0-49% versus 50-100% of their reading or math instruction in special education could only be conducted within the emotionally impaired (EI) and learning disabled (LD) categories.

3. Comparisons between the various percentages of reading or math instruction in special education could only be conducted within the emotionally impaired (EI) and learning disabled (LD) categories, but with specially designed percentage comparisons to compensate for the unequal student distributions.

4. Comparisons between and within a majority of the special education categories took place for students receiving minimal (0-9%) versus maximal (90-100%) reading or math instruction in special education because of the majority of students from each category reported in those areas.

5. Comparisons between the low-incidence special education groups of physically or otherwise health impaired (POHI), visually impaired (VI), and hearing impaired (HI) were limited because of the small numbers of students from those groups involved in the study (POHI = 10, VI = 4, HI = 11).

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

In Chapter IV, the data gathered to test the hypotheses of the study are presented and analyzed. The chapter is divided into the following sections: description of the sample, description of the research findings, and summary of the findings.

Description of the Sample

Fourth-grade special education students from 97 school districts randomly chosen by a systematic stratification method from Michigan's 530 districts participated in the study. The following information was obtained on each student: special education impairment category, percentage of math and reading instruction in special education, whether the student's integration in general education reading/English would allow his/her MEAP test results to be included in the district summary report, and the test proctors' judgment of the appropriateness of the mechanics of the MEAP test for that student.

The number of students involved in the study, by special education category, is presented in Table 4.1, along with the total number of special education students in each category in Michigan.

Table 4.1.--Fourth-grade special education student participants, by special education category.

Category	Number of Participants	Category % of Sample	Total Number of Students in Michigan	Category % of Total Special Education Population
Educable mentally impaired (EMI)	82	10.92%	1,174	9.62%
Speech and language impaired (SLI)	31	4.14%	3,457	28.33%
Emotionally impaired (EI)	138	18.37%	1,554	12.74%
Physically or otherwise health impaired (POHI)	10	1.33%	281	2.30%
Visually impaired (VI)	4	.53%	62	.50%
Learning disabled (LD)	475	63.25%	5,036	41.27%
Hearing impaired (HI)	11	1.46%	176	1.45%
Special education populations not in study	0	0	463	3.79%
Total	751	100%	12,203	100%
Total for populations in study	751		11,740	

Table E-1 (Appendix E) shows the actual number of sampled Michigan school districts from which student data were gathered. In this table, districts are separated according to stratum. (Refer to Appendix A for community type and regional make-up of strata.)

Table 4.2 shows the number of responses received for each question in the special-education-study section of the MEAP test answer sheet. Responses are broken down according to impairment

Table 4.2.--Number of responses received to each question in the special-education-study section of the MEAP test, by impairment group.

Category	Question 1 (Special Education Category)	Question 2 (Percent of Math Instruction in Special Education)	Question 3 (Percent of Reading Instruction in Special Education)	Question 4 (Include in Summary Report)	Question 5 (MEAP Test Appropriate for This Student?)
Educable mentally impaired (EMI)	82	81	81	82	82
Speech and language impaired (SLI)	31	31	31	31	31
Emotionally impaired (EI)	138	138	138	138	138
Physically or otherwise health impaired (POHI)	10	10	10	10	9
Visually impaired (VI)	4	4	4	4	4
Learning disabled (LD)	475	470	471	475	467
Hearing impaired (HI)	11	11	11	11	11
Total	751	745	746	751	742

group. From this table it can be seen that not every question was answered for all special education students taking the test.

Tables 4.3, 4.4, 4.5, and 4.6 contain information on the special education students that was gathered through the five questions in the special education section of the MEAP test. Table 4.3 displays a breakdown of special education students according to percentage of math instruction in special education. Table 4.4 shows a breakdown of special education students according to the percentage of reading instruction in special education. A breakdown of special education students according to their exclusion in or exclusion from the summary reports is shown in Table 4.5. Table 4.6 contains a breakdown of special education students according to whether MEAP proctors judged the mechanics of the MEAP test to be appropriate or not appropriate for them.

Many of the categories relating to the percentage of math or reading instruction in special education contained insufficient numbers of subjects for analysis purposes. (Refer to Table E-2, Appendix E.) Consequently, only those subjects who spent a minimal (0-9%) or a maximal (90-100%) amount of time in special education math or reading instruction were used in the analysis.

Tables 4.7 and 4.8 are tabulations of those students for whom the MEAP proctors judged the mechanics of the MEAP test to be appropriate or not appropriate, according to the percentage of instruction received in special education math and reading, respectively.

Table 4.3.--Breakdown of special education students, by category, according to percentage of math instruction in special education.

Category	Percentage of Math Instruction in Special Education					
	0-9%	10-29%	30-49%	50-69%	70-89%	90-100%
Educable mentally impaired (EMI)	0	0	10	0	1	70
Speech and language impaired (SLI)	28	0	1	0	0	2
Emotionally impaired (EI)	35	9	5	6	3	80
Physically or otherwise health impaired (POHI)	5	0	0	0	0	5
Visually impaired (VI)	4	0	0	0	0	0
Learning disabled (LD)	179	59	46	20	5	161
Hearing impaired (HI)	1	1	0	0	0	9
Column totals	252	69	62	26	9	327

Total N for all categories = 745

Table 4.4.--Breakdown of special education students, by category, according to percentage of reading instruction in special education.

Category	Percentage of Reading Instruction in Special Education					
	0-9%	10-29%	30-49%	50-69%	70-89%	90-100%
Educable mentally impaired (EMI)	1	0	1	8	0	71
Speech and language impaired (SLI)	28	0	0	1	0	2
Emotionally impaired (EI)	30	5	5	8	2	88
Physically or otherwise health impaired (POHI)	4	3	0	0	0	3
Visually impaired (VI)	3	1	0	0	0	0
Learning disabled (LD)	71	54	40	45	16	245
Hearing impaired (HI)	2	0	0	0	0	9
Column totals	139	63	46	62	18	418

Total N for all categories = 746

Table 4.5.--Breakdown of special education students, by category, according to inclusion in or exclusion from MEAP summary reports.

Category	Total Number Included	Total Number Excluded	Total No. by Category	Percent Included	Percent Excluded
Educable mentally impaired (EMI)	1	81	82	1.2%	98.8%
Speech and language impaired (SLI)	27	4	31	87.1%	12.9%
Emotionally impaired (EI)	41	97	138	29.7%	70.3%
Physically or otherwise health impaired (POHI)	4	6	10	40.0%	60.0%
Visually impaired (VI)	4	0	4	100.0%	0
Learning disabled (LD)	146	329	475	30.7%	69.3%
Hearing impaired (HI)	7	4	11	63.6%	36.4%
Column Totals	230	521	751		

Table 4.6.--Breakdown of special education students, by category, according to whether the mechanics of the MEAP test were judged to be appropriate or not appropriate for them.

Category	Test Appropriate	Test Not Appropriate	Total No. by Category	Percent Test Appropriate	Percent Test Not Appropriate
Educable mentally impaired (EMI)	1	81	82	1.2%	98.8%
Speech and language impaired (SLI)	25	6	31	80.65%	19.35%
Emotionally impaired (EI)	52	86	138	37.7%	62.3%
Physically or otherwise health impaired (POHI)	5	4	9	55.6%	44.4%
Visually impaired (VI)	3	1	4	75.0%	25.0%
Learning disabled (LD)	116	351	467	24.8%	75.2%
Hearing impaired (HI)	8	3	11	72.7%	27.3%
Column totals	210	532	742		

Table 4.7.--Distribution of special education students in each category, according to whether the mechanics of the MEAP test were judged to be appropriate or not appropriate for them, by percentage of math instruction in special education.

Category	Percentage of Math Instruction in Special Education					
	0-9%	10-29%	30-49%	50-69%	70-89%	90-100%
Mechanics of MEAP Test Judged Appropriate						
Educable mentally impaired (EMI)						1
Speech and language impaired (SLI)	25					
Emotionally impaired (EI)	17	5	3	1	1	25
Physically or otherwise health impaired (POHI)	3					2
Visually impaired (VI)	3					
Learning disabled (LD)	75	21	7	6	1	6
Hearing impaired (HI)	1					7
Totals	124	26	10	7	2	41
Mechanics of MEAP Test Judged Not Appropriate						
Educable mentally impaired (EMI)			10		1	69
Speech and language impaired (SLI)	3		1			2
Emotionally impaired (EI)	18	4	2	5	2	55
Physically or otherwise health impaired (POHI)	1					3
Visually impaired (VI)	1					
Learning disabled (LD)	103	38	38	14	4	151
Hearing impaired (HI)						2
Totals	126	42	51	19	7	282

Table 4.8.--Distribution of special education students in each category according to whether the mechanics of the MEAP test were judged to be appropriate or not appropriate for them, by percentage of reading instruction in special education.

Category	Percentage of Reading Instruction in Special Education					
	0-9%	10-29%	30-49%	50-69%	70-89%	90-100%
Mechanics of MEAP Test Judged Appropriate						
Educable mentally impaired (EMI)	1					
Speech and language impaired (SLI)	25					
Emotionally impaired (EI)	19	3	3	2		25
Physically or otherwise health impaired (POHI)	3	1				1
Visually impaired (VI)	3					
Learning disabled (LD)	41	29	14	5	3	24
Hearing impaired (HI)	2					6
Totals	94	33	17	7	3	56
Mechanics of MEAP Test Judged Not Appropriate						
Educable mentally impaired (EMI)			1	8		71
Speech and language impaired (SLI)	3			1		2
Emotionally impaired (EI)	11	2	2	6	2	63
Physically or otherwise health impaired (POHI)		2				2
Visually impaired (VI)		1				
Learning disabled (LD)	30	25	26	40	13	215
Hearing impaired (HI)						3
Totals	44	30	29	55	15	356

Table E-2 (Appendix E) reports the mean MEAP math and reading scores for special education students in each category, by percentage of math and reading instruction received in special education. Table E-3 (Appendix E) summarizes the mean MEAP math and reading scores of special education students in each category, according to whether the mechanics of the MEAP test were judged to be appropriate or not appropriate for them.

Description of Research Findings

The statistical analyses of MEAP reading and math scores of fourth-grade special education students from seven impairment groups were designed to test the five hypotheses formulated for this study. In the following pages, each research hypothesis is restated, followed by a description of the analysis technique(s) used to test the hypothesis and the results of the analysis.

Hypothesis 1

Ho 1: There is no significant difference in mean MEAP reading scores between different impairment groups.

Table 4.9 reveals the results of the one-way analysis of variance (ANOVA) performed on the reading scores of students in the seven impairment groups. A significant difference in mean MEAP reading scores was found for special education students in different impairment groups. To determine which of the impairment groups differed significantly from each other, a Scheffé procedure for comparing mean group differences was performed. The Scheffé test indicated that EMI students differed significantly from SLI, EI, LD, and HI

students, in terms of mean MEAP reading scores. The test also indicated that SLI students differed significantly from EI and LD students. In Figure 4.1, the asterisks indicate which categories of special education students differed significantly from each other in terms of mean MEAP reading scores.

Table 4.9.--ANOVA results: comparison of students' mean MEAP reading scores according to impairment groups.

Source	MS	df	F	Significance of F
Between seven impairment groups	977.25	6	19.54	<0.0000*
Error	50.00	744		

*Significant at or beyond the .05 level of confidence.

	EMI	SLI	EI	POHI	VI	LD	HI
EMI							
SLI	*		*			*	
EI	*						
POHI							
VI							
LD	*						
HI	*						

Figure 4.1.--Significant differences between impairment groups in terms of mean MEAP reading scores.

Table 4.10 contains the students' mean MEAP reading scores and standard deviations by impairment group. As reported in Table 4.10, the higher mean MEAP reading scores for SLI, EI, LD, and HI students as compared to EMI students and the higher mean MEAP reading scores for SLI students as compared to EI and LD students suggest that the indicated impairment groups scored differently on the MEAP reading test.

Table 4.10.--Students' mean MEAP reading scores and standard deviations, by impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	82	3.85	4.40
Speech and language impaired (SLI)	31	19.09	7.25
Emotionally impaired (EI)	138	10.03	7.86
Physically or otherwise health impaired (POHI)	10	10.60	7.15
Visually impaired (VI)	4	11.25	8.84
Learning disabled (LD)	475	9.78	7.13
Hearing impaired (HI)	11	14.81	8.50

Additional one-way analyses of variance, holding constant the minimal (0-9%) and maximal (90-100%) percentage of math or reading instruction, were conducted to pursue more specific information regarding Hypothesis 1. The minimal (0-9%) and maximal (90-100%) percentages of math or reading instruction were held constant because

a majority of the students from all categories fell into the two time allocations, which allowed for more specific analysis of the difference in mean MEAP reading scores between the different impairment groups. The results of these additional one-way analyses of variance follow.

Table 4.11 reveals the results of the one-way analysis of variance performed on the mean MEAP reading scores of students receiving minimal (0-9%) reading instruction in special education. There was a significant difference in mean MEAP reading scores between student impairment groups receiving minimal (0-9%) reading instruction in special education.

Table 4.11.--ANOVA results: comparison of mean MEAP reading scores of students receiving minimal (0-9%) reading instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between seven impairment groups	125.21	6	2.89	<0.0110*
Error	43.25	132		

*Significant at or beyond the .05 level of confidence.

To discover which of the impairment groups differed significantly from each other, a Scheffé procedure for a comparison of mean group differences was performed. The test indicated that SLI students receiving minimal reading instruction in special education differed

significantly from their counterparts in the EI group in terms of mean MEAP reading scores.

Table 4.12 shows the mean MEAP reading scores and standard deviations of students receiving minimal reading instruction in special education by impairment group. As shown in Table 4, SLI students receiving minimal (0-9%) reading instruction in special education scored higher on the MEAP reading test than did their counterparts in the EI group.

Table 4.12.--Mean MEAP reading scores and standard deviations for students receiving minimal (0-9%) reading instruction in special education, by impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	1	12.00	
Speech and language impaired (SLI)	28	20.00	6.35
Emotionally impaired (EI)	30	13.56	6.37
Physically or otherwise health impaired (POHI)	4	14.75	2.87
Visually impaired (VI)	3	13.66	9.07
Learning disabled (LD)	71	15.38	6.80
Hearing impaired (HI)	2	21.50	3.53

Table 4.13 shows the results of the one-way analysis of variance performed on the mean MEAP reading scores of students receiving minimal (0-9%) math instruction in special education by

impairment groups. A significant difference existed in mean MEAP reading scores of student impairment groups receiving minimal (0-9%) math instruction in special education.

Table 4.13.--ANOVA results: comparison of mean MEAP reading scores of students receiving minimal (0-9%) math instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between six impairment groups	394.10	5	8.12	<0.0000*
Error	48.50	246		

*Significant at or beyond the .05 level of confidence.

To find out which of the impairment groups differed significantly from each other, a Scheffé procedure for comparison of mean group differences was performed. The test indicated that SLI students receiving minimal math instruction in special education differed significantly from EI and LD students in terms of mean MEAP reading scores.

Table 4.14 contains a summary of the mean MEAP reading scores and standard deviations of students receiving minimal (0-9%) math instruction in special education by impairment group. SLI students receiving minimal math instruction in special education scored higher on the MEAP reading test than did their counterparts in the EI and LD groups.

Table 4.14.--Mean MEAP reading scores and standard deviations for students receiving minimal (0-9%) math instruction in special education, by six impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Speech and language impaired (SLI)	28	20.00	6.35
Emotionally impaired (EI)	35	12.65	6.68
Physically or otherwise health impaired (POHI)	5	15.20	3.27
Visually impaired (VI)	4	11.25	8.84
Learning disabled (LD)	179	11.37	7.12
Hearing impaired (HI)	1	24.00	

Table 4.15 reveals the results of the one-way analysis of variance performed on the mean MEAP reading scores of students receiving maximal (90-100%) reading instruction in special education by impairment groups. There was a significant difference in mean MEAP reading scores of student impairment groups receiving maximal reading instruction in special education.

Table 4.15.--ANOVA results: comparison of mean MEAP reading scores of students receiving maximal (90-100%) reading instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between six impairment groups	285.91	5	7.36	<0.0000*
Error	38.83	412		

*Significant at or beyond the .05 level of confidence.

To discover which of the impairment groups differed significantly from each other, a Scheffé procedure to compare mean group differences was performed. The test indicated that EMI students receiving maximal (90-100%) reading instruction in special education differed significantly from EI, LD, and HI students in terms of mean MEAP reading scores.

Table 4.16 shows the mean MEAP reading scores and standard deviations of students receiving maximal (90-100%) reading instruction in special education by impairment group. EI, LD, and HI students receiving maximal reading instruction in special education scored higher on the MEAP reading test than did EMI students receiving maximal reading instruction in special education.

Table 4.16.--Mean MEAP reading scores and standard deviations for students receiving maximal (90-100%) reading instruction in special education, by six impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaire impaired (EMI)	71	3.53	4.35
Speech and language impaired (SLI)	2	12.00	15.55
Emotionally impaired (EI)	88	8.20	7.74
Physically or otherwise health impaired (POHI)	3	3.33	5.77
Learning disabled (LD)	245	7.13	5.91
Hearing impaired	9	13.33	8.67

Table 4.17 contains the results of the one-way analysis of variance performed on the mean MEAP reading scores of students receiving maximal (90-100%) instruction in special education by impairment group. There was a significant difference in mean MEAP reading scores of student impairment groups receiving maximal math instruction in special education.

Table 4.17: ANOVA results: comparison of mean MEAP reading scores of students receiving maximal (90-100%) math instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between six impairment groups	316.99	5	8.05	<0.0000*
Error	39.37	321		

*Significance at or beyond the .05 level of confidence.

To determine which of the impairment groups differed significantly from each other, a Scheffé procedure to compare mean group differences was performed. The test indicated that EMI students receiving maximal (90-100%) math instruction in special education differed significantly from EI and HI students in terms of mean MEAP reading scores. LD students differed significantly from HI students in this analysis.

Table 4.18 shows a summary of the mean MEAP reading scores and standard deviations of students receiving maximal (90-100%)

math instruction in special education by impairment group. EI and HI students receiving maximal math instruction in special education scored higher on the MEAP reading test than did their counterparts in the EMI group. Likewise, HI students receiving maximal math instruction in special education scored higher on the MEAP reading test than did their counterparts in the LD group.

Table 4.18.--Mean MEAP reading scores and standard deviations for students receiving maximal (90-100%) math instruction in special education, by six impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	70	3.61	4.41
Speech and language impaired (SLI)	2	12.00	15.55
Emotionally impaired (EI)	80	8.42	7.98
Physically or otherwise health impaired (POHI)	5	6.00	7.17
Learning disabled (LD)	161	6.57	5.74
Hearing impaired (HI)	9	15.00	8.07

Hypothesis 2

Ho 2: There is no significant difference in mean MEAP math scores between different impairment groups.

Table 4.19 reveals the results of the one-way analysis of variance performed on the mean MEAP math scores of students in the seven impairment groups. There was a significant difference in mean

MEAP math scores for special education students in different impairment groups.

Table 4.19.--ANOVA results: comparison of students' mean MEAP math scores according to impairment groups.

Source	MS	df	F	Significance of F
Between seven impairment groups	1671.98	6	32.06	<0.0000*
Error	52.14	744		

*Significant at or beyond the .05 level of confidence.

To determine which of the impairment groups differed significantly from each other, a Scheffé procedure for comparing mean group differences was performed. The test indicated that EMI students differed significantly from SLI, EI, POHI, VI, LD, and HI students in terms of mean MEAP math scores. The Scheffé test also indicated that SLI students differed significantly from EI and LD students in terms of mean MEAP math scores. In Figure 4.2, the asterisks indicate which categories of special education students differed significantly from each other on this measure.

Table 4.20 contains the students' mean MEAP math scores and standard deviations by impairment group. As shown in the table, the higher mean MEAP math scores for SLI, EI, POHI, VI, LD, and HI students as compared to EMI students and the higher mean MEAP math scores for SLI students as compared to EI and LD students suggest

that the indicated impairment groups scored differently on the MEAP math test.

	EMI	SLI	EI	POHI	VI	LD	HI
EMI							
SLI	*		*			*	
EI	*						
POHI	*						
VI	*						
LD	*						
HI	*						

Figure 4.2.--Significant differences between impairment groups in terms of mean MEAP math scores.

Table 4.20.--Students' mean MEAP math scores and standard deviations, by impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	82	5.97	5.19
Speech and language impaired (SLI)	31	24.06	4.33
Emotionally impaired (EI)	138	14.53	7.98
Physically or otherwise health impaired (POHI)	10	16.00	8.51
Visually impaired	4	19.50	10.37
Learning disabled (LD)	475	15.85	7.38
Hearing impaired	11	20.54	6.71

In addition, one-way analyses of variance, holding constant the minimal (0-9%) and maximal (90-100%) percentages of math and reading instruction in special education, were conducted to pursue more specific information regarding Hypothesis 2. The minimal and maximal percentages of math and reading instruction were held constant because a majority of the students from all impairment categories fell into the two time allocations, which allowed for more specific analysis of the difference of mean MEAP math scores between the different impairment groups. The results of these additional one-way analyses of variance follow.

Table 4.21 reveals the results of the one-way analysis of variance performed on the mean MEAP math scores of students receiving minimal (0-9%) math instruction in special education by impairment category. There was a significant difference in mean MEAP math scores of student impairment groups receiving minimal math instruction in special education.

Table 4.21.--ANOVA results: comparison of mean MEAP math scores of students receiving minimal (0-9%) math instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between six impairment groups	186.55	5	4.41	<0.0007*
Error	42.30	246		

*Significant at or beyond the .05 level of confidence.

To discover which of the impairment groups differed significantly from each other, a Scheffé procedure for comparing mean group differences was performed. This test indicated that SLI students receiving minimal (0-9%) math instruction in special education differed significantly from EI and LD students in terms of mean MEAP math scores.

Table 4.22 shows the mean MEAP math scores and standard deviations of students receiving minimal (0-9%) math instruction in special education by impairment group. SLI students receiving minimal math instruction in special education scored higher on the MEAP math test than did their counterparts in the EI and LD groups.

Table 4.22.--Mean MEAP math scores and standard deviations for students receiving minimal (0-9%) math instruction in special education, by six impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Speech and language impaired (SLI)	28	24.17	4.49
Emotionally impaired (EI)	35	16.88	7.73
Physically or otherwise health impaired (POHI)	5	19.00	5.83
Visually impaired (VI)	4	19.50	10.37
Learning disabled (LD)	179	18.88	6.43
Hearing impaired (HI)	1	25.00	

Table 4.23 reveals the results of the one-way analysis of variance performed on the mean MEAP math scores of students receiving minimal (0-9%) reading instruction in special education by impairment groups. A significant difference existed in mean MEAP math scores of student impairment groups receiving minimal reading instruction in special education.

Table 4.23.--ANOVA results: comparison of mean MEAP math scores of students receiving minimal (0-9%) reading instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between seven impairment groups	167.89	6	3.83	<0.0015*
Error	43.76	132		

*Significant at or beyond the .05 level of confidence.

To determine which of the impairment groups differed significantly from each other, a Scheffé procedure to compare mean group differences was performed. The test indicated that SLI students receiving minimal (0-9%) reading instruction in special education differed significantly from EI and LD students in terms of mean MEAP math scores.

Table 4.24 contains a summary of the mean MEAP math scores and standard deviations of students receiving minimal (0-9%) reading instruction in special education by impairment category. SLI students

receiving minimal reading instruction in special education scored higher on the MEAP math test than did EI and LD students receiving minimal reading instruction in special education.

Table 4.24.--Mean MEAP math scores and standard deviations for students receiving minimal (0-9%) reading instruction in special education, by impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	1	19.00	
Speech and language impaired (SLI)	28	24.17	4.49
Emotionally impaired (EI)	30	16.73	8.12
Physically or otherwise health impaired (POHI)	4	21.25	6.29
Visually impaired (VI)	3	24.66	1.15
Learning disabled (LD)	71	18.57	6.73
Hearing impaired (HI)	2	22.00	4.24

Table 4.25 contains the results of the one-way analysis of variance performed on the mean MEAP math scores of students receiving maximal (90-100%) math instruction in special education by impairment category. There was a significant difference in mean MEAP math scores of student impairment groups receiving maximal math instruction in special education.

Table 4.25.--ANOVA results: comparison of mean MEAP math scores of students receiving maximal (90-100%) math instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between six impairment groups	654.01	5	13.52	<0.0000*
Error	68.36	321		

*Significant at or beyond the .05 level of confidence.

To find out which of the impairment groups differed significantly from each other, a Scheffé procedure for comparing mean group differences was performed. This test indicated that EMI students receiving maximal (90-100%) math instruction in special education differed significantly from EI, LD, and HI students and that LD students differed significantly from HI students in terms of mean MEAP math scores.

Table 4.26 shows the mean MEAP math scores and standard deviations of students receiving maximal (90-100%) math instruction in special education by impairment group. EI, LD, and HI students receiving maximal math instruction in special education scored higher on the MEAP math test than did their counterparts in the EMI group. Also, HI students receiving maximal math instruction in special education scored higher on the MEAP math test than did their counterparts in the LD group.

Table 4.26.--Mean MEAP math scores and standard deviations of students receiving maximal (90-100%) math instruction in special education, by six impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	70	5.81	4.99
Speech and language impaired (SLI)	2	22.50	3.53
Emotionally impaired (EI)	80	13.02	8.10
Physically or otherwise health impaired (POHI)	5	13.00	10.31
Learning disabled (LD)	161	11.63	6.96
Hearing impaired (HI)	9	19.88	7.28

Table 4.27 shows the results of the one-way analysis of variance performed on the mean MEAP math scores of students receiving maximal (90-100%) instruction in special education by impairment group. A significant difference was found in mean MEAP math scores for student impairment groups receiving maximal reading instruction in special education.

Table 4.27.--ANOVA results: comparison of mean MEAP math scores of students receiving maximal (90-100%) reading instruction in special education according to impairment groups.

Source	MS	df	F	Significance of F
Between six impairment groups	958.64	5	18.74	<0.0000*
Error	51.12	412		

*Significant at or beyond the .05 level of confidence.

Table 4.28 shows the mean MEAP math scores and standard deviations of students receiving maximal (90-100%) reading instruction in special education by impairment group. To determine which of the impairment groups differed significantly from each other, a Scheffé procedure to compare mean group differences was performed. This test indicated that EMI students receiving maximal (90-100%) reading instruction in special education scored significantly lower than EI, LD, and HI students. HI students receiving maximal reading instruction in special education scored higher on the MEAP math test than did their counterparts in the EI and LD groups.

Table 4.28.--Mean MEAP math scores and standard deviations of students receiving maximal (90-100%) reading instruction in special education, by six impairment groups.

Impairment Categories	N	Mean	Standard Deviation
Educable mentally impaired (EMI)	71	5.77	4.82
Speech and language impaired (SLI)	2	22.50	3.53
Emotionally impaired (EI)	88	13.25	7.81
Physically or otherwise health impaired (POHI)	3	8.33	7.09
Learning disabled (LD)	245	14.26	7.46
Hearing impaired (HI)	9	20.22	7.31

Hypothesis 3

Ho 3: There is no significant difference in mean MEAP reading scores of special education students in each impairment classification receiving different percentages of math and reading instruction in special education.

This hypothesis was formulated to compare the mean MEAP reading scores of students in each impairment group according to the percentage of math and reading instruction received in special education. Because there was an insufficient distribution of students in various percentage-of-instruction groups, analyses within each of the seven impairment categories could not be conducted. However, comparisons of two impairment categories could be conducted regarding various percentages of math and reading instruction in special education. Further comparisons of mean MEAP math and reading scores of students receiving minimal (0-9%) and maximal (90-100%) math or reading instruction in special education were conducted for five impairment categories.

The emotionally impaired (EI) and learning disabled (LD) categories had the largest distribution of students across a majority of percentage-of-instruction categories. Because of the clustering of students within the EI and LD categories, two separate percentage-of-instruction group comparisons were established for inclusion in the statistical analysis. The percentage-of-instruction group comparisons used in the analysis for emotionally impaired and learning disabled students are shown in Table 4.29.

Table 4.29.--Percentage-of-instruction levels for emotionally impaired (EI) and learning disabled (LD) groups.

	Special Education Categories	
	EI	LD
Percentage-of-instruction group comparisons	0-29% vs. 30-49% 0-49% vs. 50-100%	0-29% vs. 30-49% 0-49% vs. 50-100% 50-69% vs. 70-100%

The statistical analysis used was a multivariate analysis of variance (MANOVA), using the groups formed by percentage of math and reading instruction in special education as the multiple variates. These multiple variates were interdependent and thus required that the analysis be arranged in a manner that placed the most important comparison last, with other important comparisons immediately preceding it.

Table 4.30 shows the results of the multivariate analysis of variance for the mean MEAP reading scores of emotionally impaired (EI) and learning disabled (LD) students within the two percentage-of-instruction comparison groups.

Because of unequal cell sizes and the interdependency of the groups formed by percentages of math and reading instruction in special education, the first indication of significance progressing from the bottom of the comparisons to the top is valid. All other comparisons may be confounded.

The comparison of scores of groups receiving 0-49% versus 50-100% of reading instruction in special education was ordered as

Table 4.30.--MANOVA results: comparisons of emotionally impaired (EI) and learning disabled (LD) students' mean MEAP reading scores according to percentage of math and reading instruction in special education.

Source of Variation	MS	df	F	Significance of F
For Emotionally Impaired Students				
Time Math 0-29% vs. 30-49%	322.01	1	5.76	.018
Time Math 0-49% vs. 50-100%	376.26	1	6.74	<.011*
Time Reading 0-29% vs. 30-49%	182.88	1	3.27	.073
Time Reading 0-49% vs. 50-100%	17.40	1	.31	.578
Time Math by Time Reading	148.73	2	2.66	.073
Error	55.82	131		
For Learning Disabled Students				
Time Math 50-69% vs. 70-100%	1778.77	1	42.60	0.0
Time Math 0-29% vs. 30-49%	23.51	1	.56	.453
Time Math 0-49% vs. 50-100%	696.30	1	16.67	.000
Time Reading 50-69% vs. 70-100%	455.86	1	10.91	.001
Time Reading 0-29% vs. 30-49%	929.81	1	22.27	0.0
Time Reading 0-49% vs. 50-100%	866.66	1	20.75	<0.0*
Time Math by Time Reading	29.93	8	.71	.677
Error	41.74	455		

*Significant at or beyond the .05 level of confidence.

the most important comparison because it is most relevant to the current Michigan criteria for including special education students in the MEAP test. Subsequent comparisons of percentages of math and reading instruction in special education were arranged in descending order of importance.

In Table 4.30, the significance level of .011 suggests that EI students receiving 0-49% of their math instruction in special education scored significantly higher on the MEAP reading test than did EI students receiving 50-100% of their math instruction in special education. Similarly, the significance level of 0.0 suggests that LD students receiving 0-49% of their reading instruction in special education scored significantly higher on the MEAP reading test than did LD students receiving 50-100% of their reading instruction in special education.

Further analyses were conducted to determine if there was a significant difference between the mean MEAP reading scores of special education students in five impairment groups receiving minimal (0-9%) versus maximal (90-100%) math or reading instruction in special education. The other two groups did not have students in these percentage groups; hence they were excluded from this analysis.

Figure 4.3 displays the mean MEAP reading scores of special education students, by impairment category, receiving minimal (0-9%) versus maximal (90-100%) reading instruction in special education. Figure 4.4 displays the mean MEAP reading scores of special education students, by impairment category, receiving minimal (0-9%) versus maximal (90-100%) math instruction in special education.

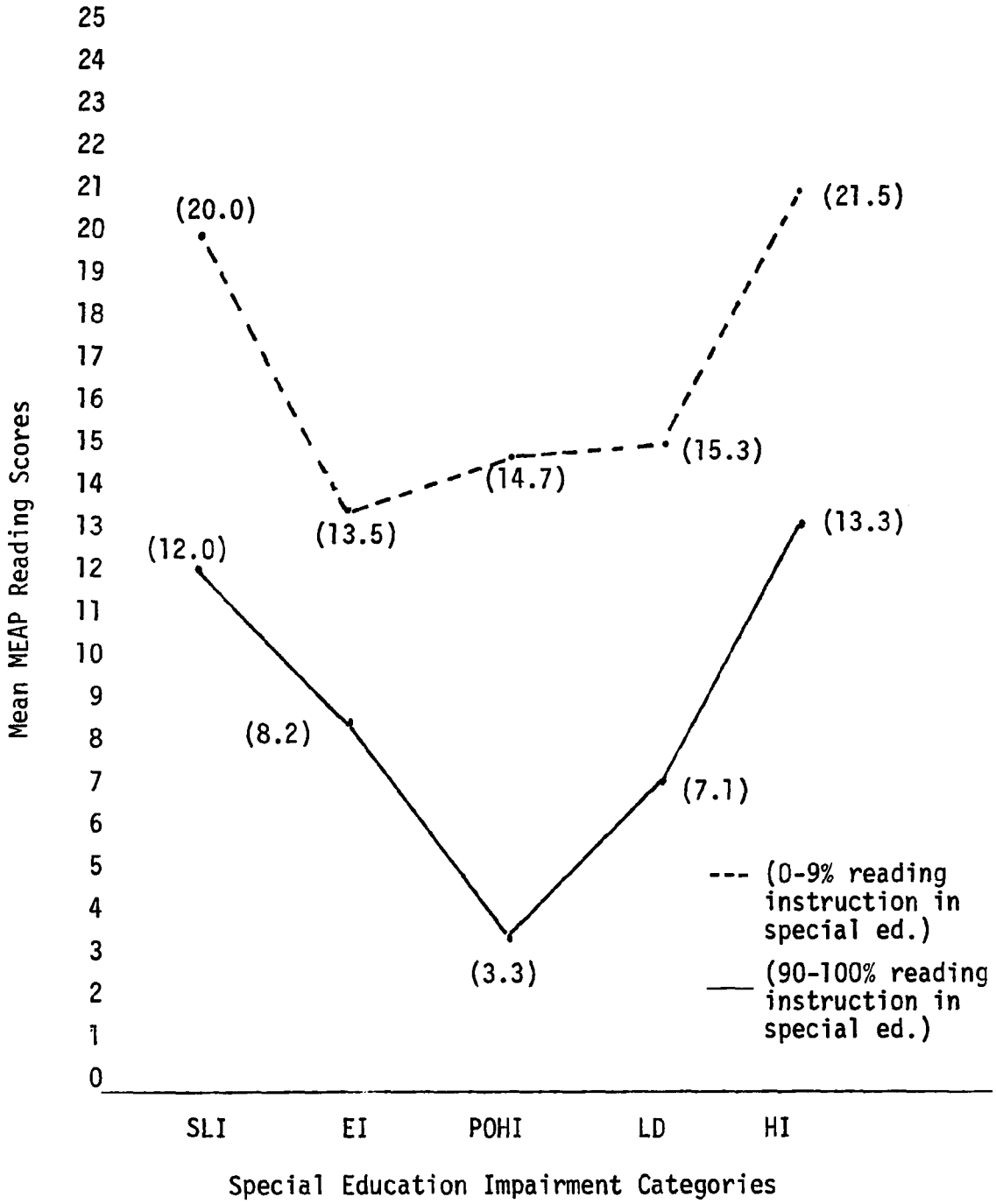


Figure 4.3.--Mean MEAP reading scores for special education students, by impairment category, receiving minimal (0-9%) and maximal (90-100%) reading instruction in special education.

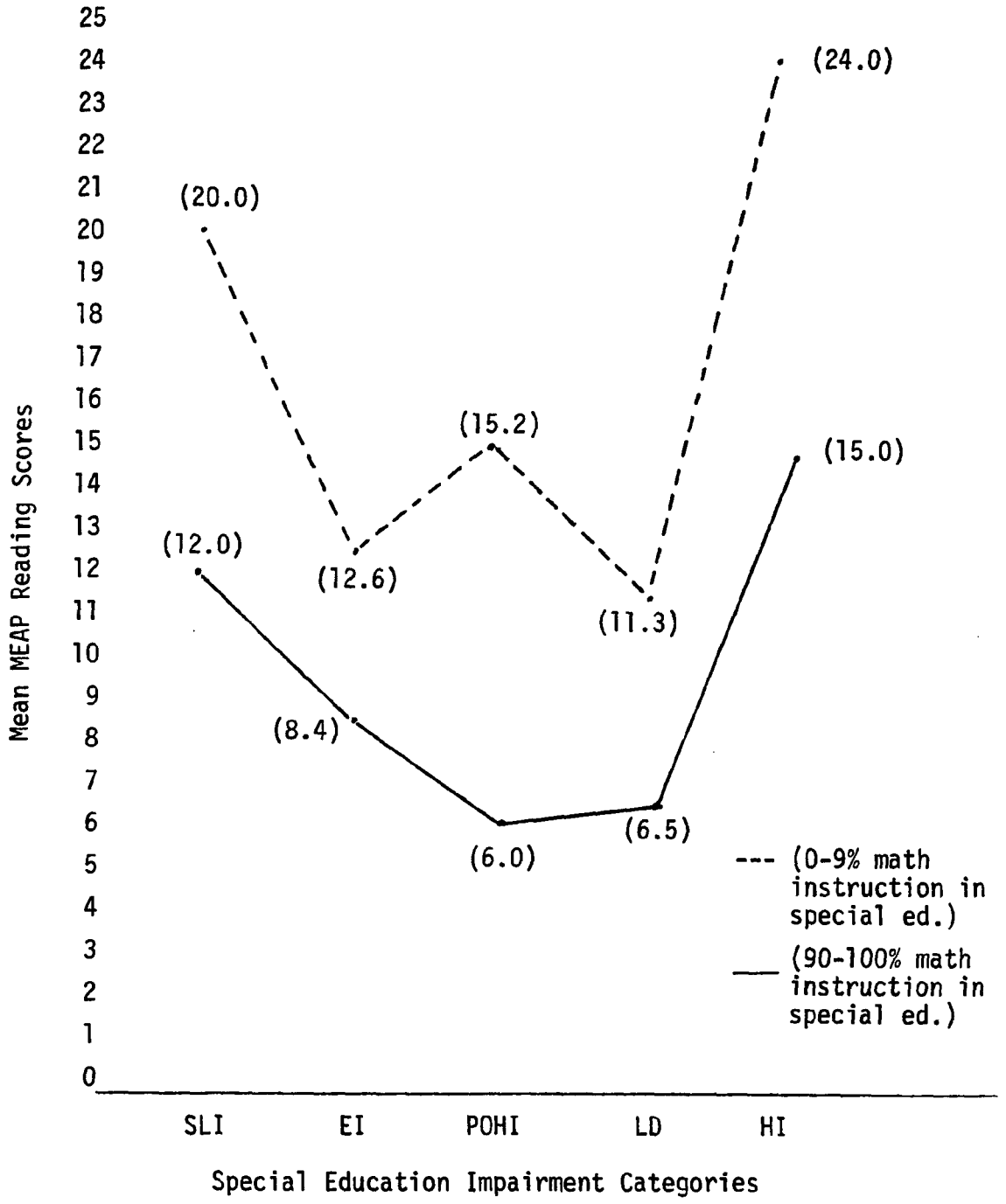


Figure 4.4.--Mean MEAP reading scores for special education students, by impairment category, receiving minimal (0-9%) and maximal (90-100%) math instruction in special education.

T-tests were conducted to determine whether there were significant differences in mean MEAP reading scores between students within each impairment category receiving minimal (0-9%) versus maximal (90-100%) math and reading instruction in special education. Table 4.31 shows the results of the t-tests.

As shown in Table 4.31, in three out of five impairment categories (emotionally impaired, physically or otherwise health impaired, learning disabled), students receiving minimal (0-9%) math and reading instruction in special education had significantly higher mean MEAP reading scores than did students receiving maximal (90-100%) math and reading instruction in special education. However, it must be pointed out that the categories of speech and language impaired and hearing impaired had very small N's, which may have been responsible for the lack of significant differences in these categories.

Hypothesis 4

Ho 4: There is no significant difference in mean MEAP math scores of special education students in each impairment classification receiving different percentages of math and reading instruction in special education.

Hypothesis 4 was formulated to compare the mean MEAP math scores of students in each impairment group according to the percentage of math and reading instruction received in special education. Because there was an insufficient distribution of students in various percentage-of-instruction groups, analyses within each of the seven impairment categories could not be conducted. However, comparisons of two impairment categories could be conducted regarding various percentages of math and reading instruction in special education.

Table 4.31.--Results of t-tests for significant differences in mean MEAP reading scores according to percentage of math and reading instruction in special education, by impairment group.

Impairment Group	Percentage of Math & Reading Instruction in Special Educ.	N	Mean	S.D.	T-Value	Probability
Speech & language impaired (SLI)	Math					
	0-9%	28	20.0	6.36	0.720	0.601
	90-100%	2	12.0	15.55		
	Reading					
	0-9%	28	20.0	6.36	0.720	0.601
	90-100%	2	12.0	15.55		
Emotionally impaired (EI)	Math					
	0-9%	35	12.65	6.68	0.240	<0.007*
	90-100%	80	8.42	7.98		
	Reading					
	0-9%	35	13.56	6.37	3.420	<.001*
	90-100%	88	8.20	7.74		
Physically or otherwise health impaired (POHI)	Math					
	0-9%	5	15.20	3.27	0.157	<0.031*
	90-100%	5	6.00	7.17		
	Reading					
	0-9%	4	14.75	2.87	0.282	<0.017*
	90-100%	3	3.33	5.77		
Learning disabled (LD)	Math	--	--			
	0-9%	179	11.37	7.12	6.880	<0.000*
	90-100%	161	6.57	5.74		
	Reading					
	0-9%	71	15.38	6.80	9.990	<0.000*
	90-100%	245	7.13	5.91		
Hearing impaired (HI)	Math					
	0-9%	1	24.00	0.00	1.060	0.321
	90-100%	9	15.00	8.07		
	Reading					
	0-9%	2	21.50	3.53	1.260	0.238
	90-100%	9	13.33	8.67		

*Significant at or beyond the .05 level of confidence.

Further comparisons of mean MEAP math and reading scores of students receiving minimal (0-9%) and maximal (90-100%) math and reading instruction in special education were conducted for five impairment categories.

The emotionally impaired (EI) and learning disabled (LD) categories had the largest distribution of students across a majority of percentage-of-instruction categories. Because of the clustering of students within these two categories, two separate percentage-of-instruction group comparisons were established for inclusion in the statistical analysis. The percentage-of-instruction group comparisons used in the analysis for EI and LD students are shown in Table 4.32.

Table 4.32.--Percentage-of-instruction levels for emotionally impaired (EI) and learning disabled (LD) groups.

	Special Education Categories	
	EI	LD
Percentage-of-instruction group comparisons	0-29% vs. 30-49% 0-49% vs. 50-100%	0-29% vs. 30-49% 0-49% vs. 50-100% 50-69% vs. 70-100%

The statistical analysis used as a multivariate analysis of variance (MANOVA), using the groups formed by percentage of math and reading instruction in special education as the multiple variates. These multiple variates were interdependent and thus required that the analysis be arranged in a manner that placed the most important comparison last, with other important comparisons immediately preceding it.

Table 4.33 shows the results of the multivariate analysis of variance for the mean MEAP math scores of emotionally impaired

Table 4.33.--MANOVA results: comparisons of emotionally impaired (EI) and learning disabled (LD) students' mean MEAP math scores according to percentage of math and reading instruction in special education.

Source of Variation	MS	df	F	Significance of F
For Emotionally Impaired Students				
Time Math 0-29% vs. 30-49%	336.73	1	5.46	<.021*
Time Math 0-49% vs. 50-100%	186.76	1	3.03	.084
Time Reading 0-29% vs. 30-49%	6.49	1	.10	.746
Time Reading 0-49% vs. 50-100%	6.82	1	.11	.740
Time Math by Time Reading	66.21	2	1.07	.344
Error	61.62	131		
For Learning Disabled Students				
Time Math 50-69% vs. 70-100%	3078.85	1	70.75	0.0
Time Math 0-29% vs. 30-49%	603.59	1	13.87	.000
Time Math 0-49% vs. 50-100%	1155.98	1	26.56	0.0
Time Reading 50-69% vs. 70-100%	22.49	1	.51	.473
Time Reading 0-29% vs. 30-49%	6.29	1	.14	.704
Time Reading 0-49% vs. 50-100%	344.27	1	7.91	<.005*
Time Math by Time Reading	66.22	8	1.52	.147
Error	43.51	455		

*Significant at or beyond the .05 level of confidence.

(EI) and learning disabled (LD) students within the two percentage-of-instruction comparison groups.

Because of unequal cell sizes and the interdependency of the groups formed by percentage of math and reading instruction in special education, the first indication of significance progressing from the bottom of the comparisons to the top is valid. All other comparisons may be confounded.

The comparison of scores of groups receiving 0-49% versus 50-100% of reading instruction in special education was ordered as the most important comparison because it is most relevant to the current Michigan criteria for including special education students in the MEAP test. Subsequent comparisons of percentage of math and reading instruction in special education were arranged in descending order of importance.

In Table 4.33, a significance level of .021 suggests that emotionally impaired students receiving 0-29% of their math instruction in special education scored significantly higher on the MEAP math test than did emotionally impaired students receiving 30-49% of their math instruction in special education. Similarly, the significance level of .005 suggests that learning disabled students receiving 0-49% of their reading instruction in special education scored significantly higher on the MEAP math test than did learning disabled students receiving 50-100% of their reading instruction in special education.

Further analyses were conducted to determine if there was a significant difference between the mean MEAP math scores of special education students in five impairment groups receiving minimal (0-9%) versus maximal (90-100%) math and reading instruction in special education. The other two impairment groups did not have students in these percentage groups; hence they were excluded from the analysis.

Figure 4.5 displays the mean MEAP math scores of special education students, by impairment category, receiving minimal (0-9%) versus maximal (90-100%) reading instruction in special education. Figure 4.6 displays the mean MEAP math scores of special education students, by impairment category, receiving minimal (0-9%) versus maximal (90-100%) math instruction in special education.

T-tests were conducted to determine whether there were significant differences in mean MEAP math scores between students within each impairment category receiving minimal (0-9%) versus maximal (90-100%) math and reading instruction in special education. Table 4.35 shows the results of the t-tests.

As shown in Table 4.34, in two out of five impairment categories (emotionally impaired and learning disabled), students receiving minimal (0-9%) math and reading instruction in special education had significantly higher mean MEAP math scores than did students receiving maximal (90-100%) math and reading instruction in special education. However, it must be pointed out that the categories of speech and language impaired, physically or otherwise

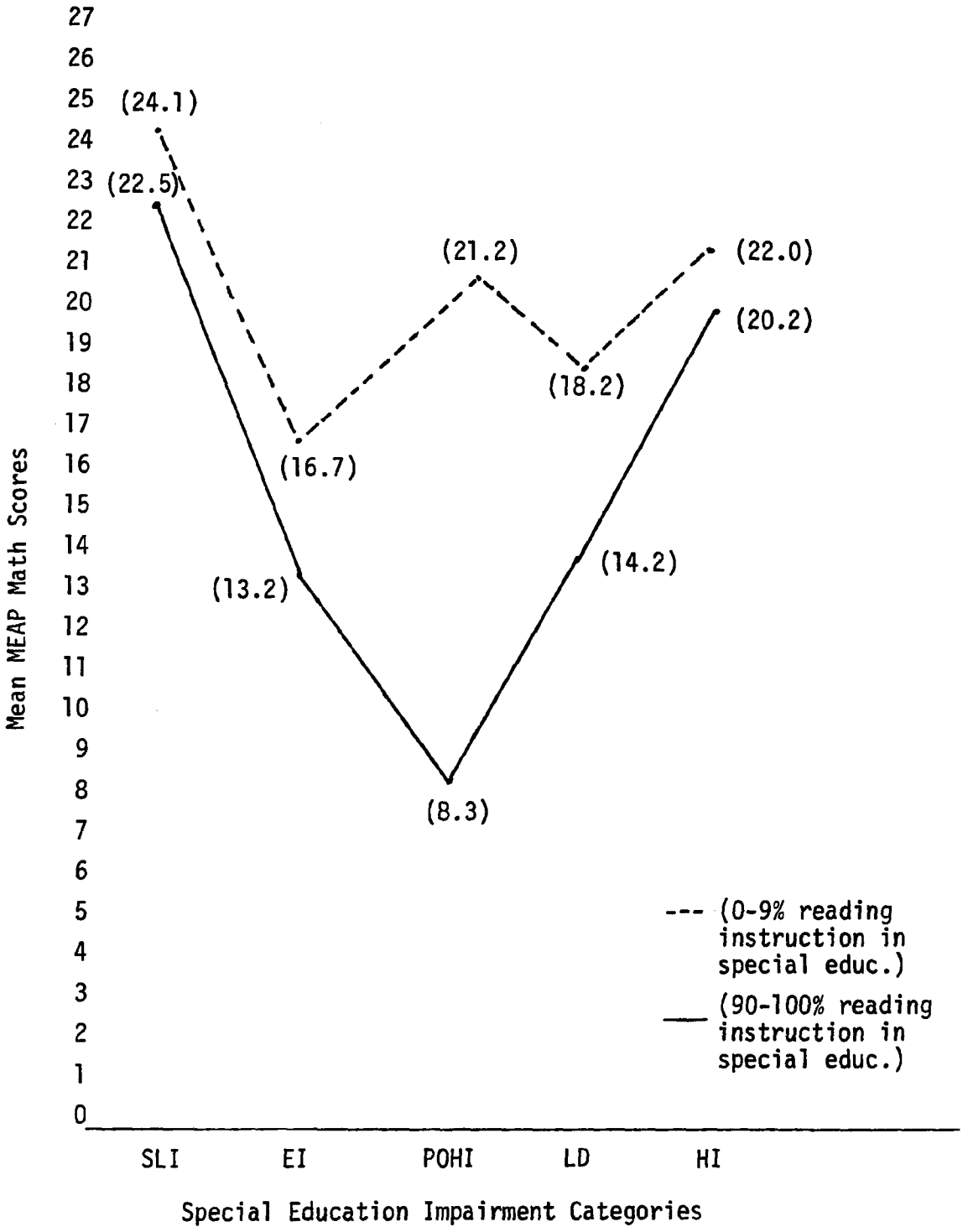


Figure 4.5.--Mean MEAP math scores for special education students, by impairment category, receiving minimal (0-9%) and maximal (90-100%) reading instruction in special education.

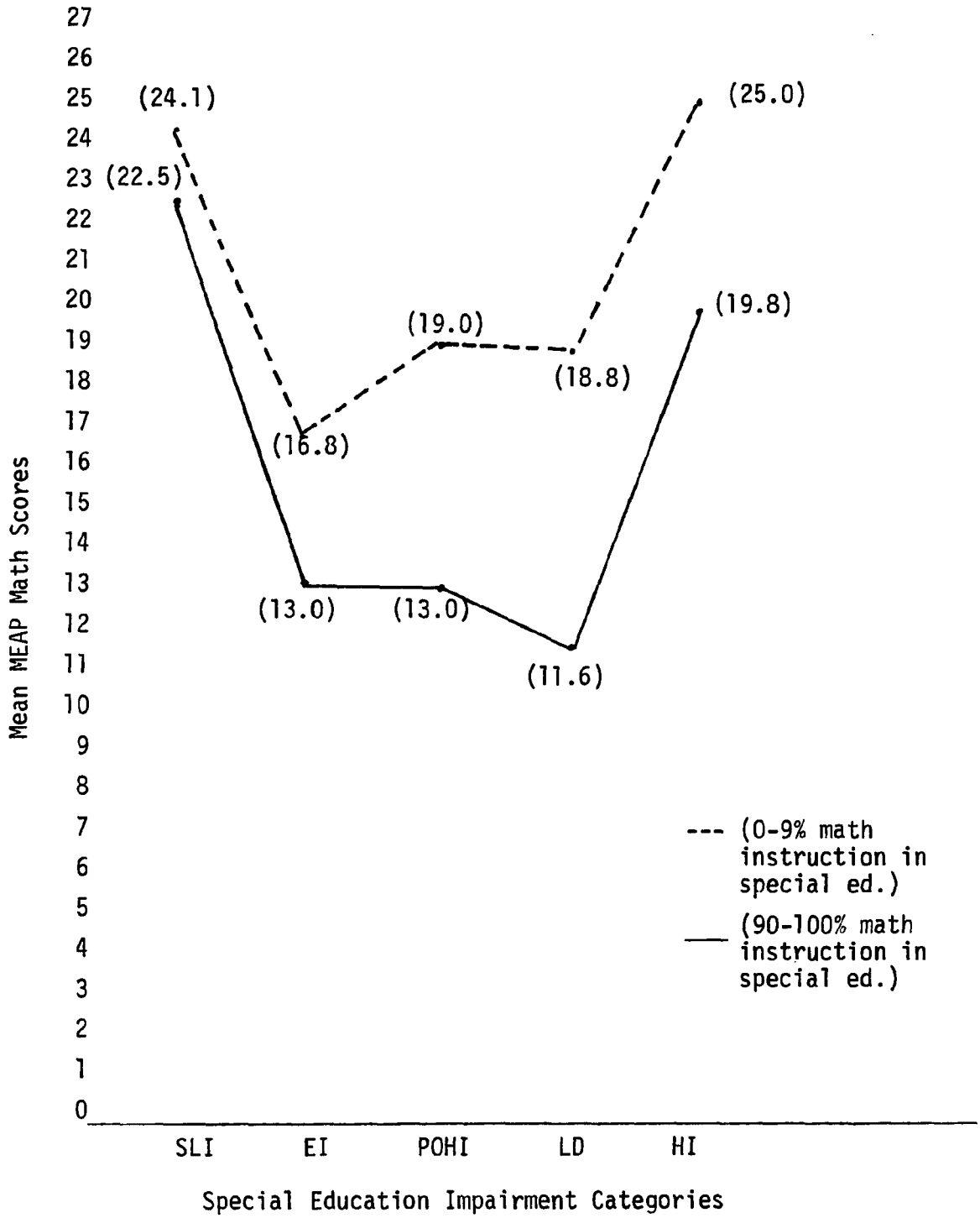


Figure 4.6.--Mean MEAP math scores for special education students, by impairment category, receiving minimal (0-9%) and maximal (90-100%) math instruction in special education.

Table 4.34.--Results of t-tests for significant differences in mean MEAP math scores according to percentage of math and reading instruction in special education, by impairment group.

Impairment Group	Percentage of Math & Reading Instruction in Special Educ.	N	Mean	S.D.	T-Value	Probability
Speech & language impaired (SLI)	Math					
	0-9%	28	24.17	4.49	0.51	0.612
	90-100%	2	22.50	3.53		
	Reading					
	0-9%	28	24.17	4.49	0.51	0.612
	90-100%	2	22.50	3.53		
Emotionally impaired (EI)	Math					
	0-9%	35	16.88	7.73	2.38	<0.019*
	90-100%	80	13.02	8.10		
	Reading					
	0-9%	30	16.73	8.12	2.09	<0.039*
	90-100%	88	13.25	7.81		
Physically or otherwise health impaired (POHI)	Math					
	0-9%	5	19.00	5.83	1.13	0.295
	90-100%	5	13.00	10.32		
	Reading					
	0-9%	4	21.25	6.29	2.55	0.051
	90-100%	3	8.33	7.09		
Learning disabled (LD)	Math					
	0-9%	179	18.88	6.43	9.99	<0.000*
	90-100%	161	11.63	6.96		
	Reading					
	0-9%	71	18.57	6.73	4.38	<0.000*
	90-100%	245	14.26	7.46		
Hearing impaired (HI)	Math					
	0-9%	1	25.00	0.00	0.67	0.525
	90-100%	9	19.88	7.28		
	Reading					
	0-9%	2	22.00	4.24	0.32	0.754
	90-100%	9	20.22	7.31		

*Significant at or beyond the .05 level of confidence.

health impaired, and hearing impaired had very small N's, which may have been responsible for the lack of significant differences in these categories.

Hypothesis 5

Ho 5: There is no significant difference in mean MEAP math and reading scores of students for whom the mechanics of the MEAP test were judged appropriate and students for whom the mechanics of the MEAP test were judged not appropriate.

T-tests were conducted to determine whether there were significant differences in mean MEAP math and reading scores for special education students for whom the mechanics of the MEAP test were judged appropriate and those for whom the mechanics of the MEAP test were judged not appropriate. The procedure proctors used to make judgments of "appropriate" or "not appropriate" is explained in Appendix C.

As shown in Table 4.35, the significance levels of 0.000 suggest that those students for whom the mechanics of the MEAP test were judged appropriate scored significantly higher on the MEAP math and reading tests than did students for whom the mechanics of the MEAP test were judged not appropriate.

Additional data pertinent to Hypothesis 5 follow. Table 4.36 contains a breakdown, by impairment category, of special education students for whom the mechanics of the MEAP test were judged appropriate and not appropriate. More detailed information regarding mean MEAP math and reading scores of students for whom the mechanics

of the MEAP test were judged appropriate and not appropriate are contained in Table E-3 (Appendix E).

Table 4.35.--Comparisons of mean MEAP math and reading scores of students for whom the mechanics of the MEAP test were judged appropriate and not appropriate.

MEAP Test	Proctors' Judgment	N	Mean	S.D.	T-Value	Probability
Math	Appropriate	210	19.94	6.43	12.32	<0.000*
	Not Appropriate	533	13.06	7.83		
Reading	Appropriate	210	15.31	7.14	14.28	<0.000*
	Not Appropriate	533	7.48	6.56		

*Significant at or beyond the .05 level of confidence.

Figures 4.7 and 4.8 display the mean MEAP math and reading scores of special education students, by impairment category, for whom the mechanics of the MEAP test were judged appropriate and not appropriate. These figures further demonstrate that students for whom the mechanics of the MEAP test were judged appropriate had higher mean MEAP math and reading scores than did students for whom the mechanics of the MEAP test were judged not appropriate. (See also Table 4.35.)

Table 4.36.--Special education students, by impairment category, for whom the mechanics of the MEAP test were judged appropriate and not appropriate.

Impairment Group	N	# Judged Appropriate	# Judged Not Appropriate	% Judged Appropriate	% Judged Not Appropriate
Educable mentally impaired (EMI)	82	1	81	1.2%	98.8%
Speech & language impaired (SLI)	31	25	6	80.6%	19.4%
Emotionally impaired (EI)	138	52	86	37.7%	62.3%
Physically or otherwise health impaired (POHI)	9	5	4	55.6%	44.4%
Visually impaired (VI)	4	3	1	75.0%	25.0%
Learning disabled (LD)	467	116	351	24.8%	75.2%
Hearing impaired (HI)	11	8	3	72.7%	27.3%
Totals for all categories	742	210	532	28.3%	71.7%

Table 4.37 shows a distribution of special education students, by impairment category, for whom the mechanics of the MEAP test were judged appropriate and not appropriate, and their inclusion in or exclusion from the MEAP summary reports. Students included in the summary reports are those who receive 50% or more of their reading/English instruction in general education.

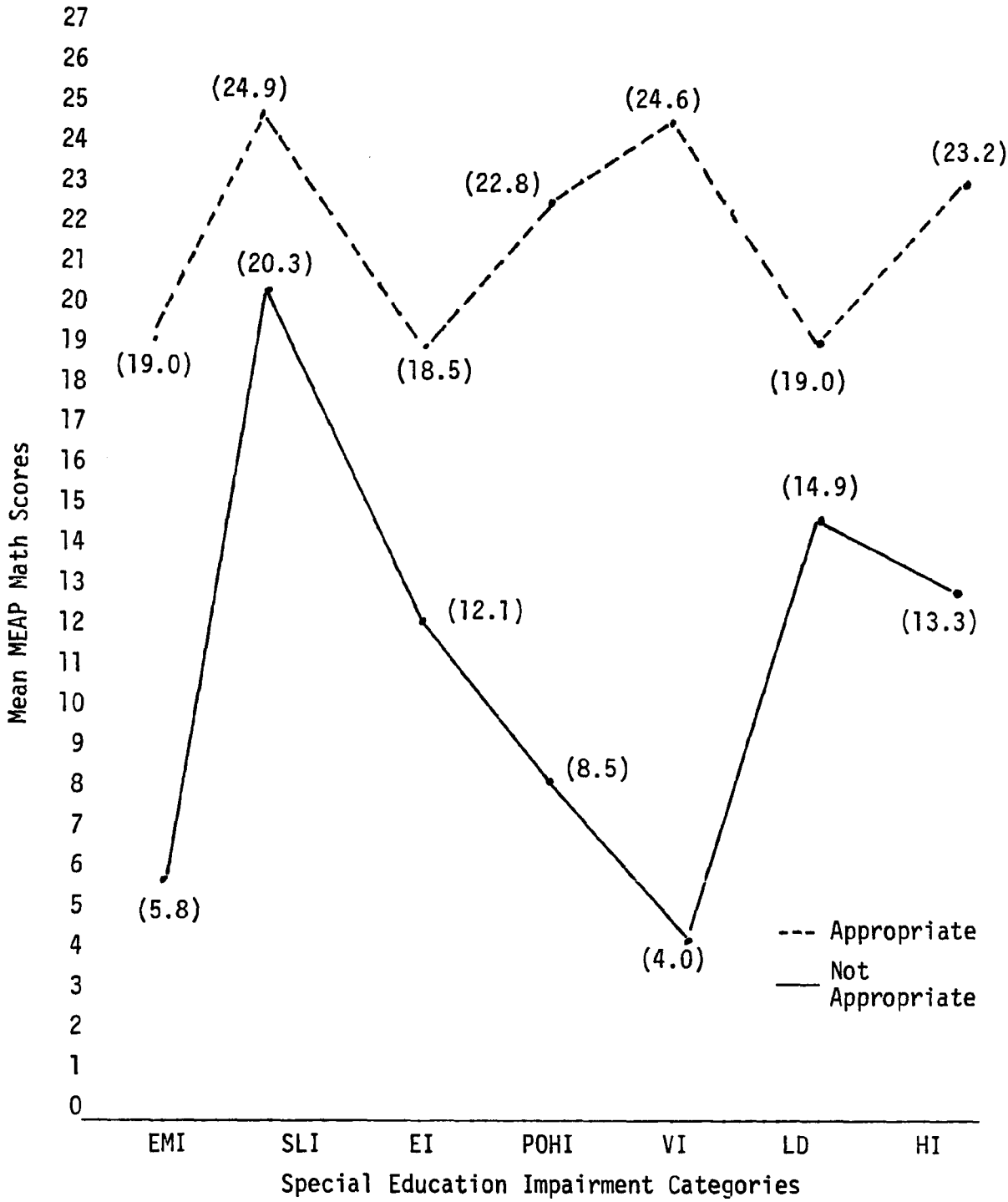


Figure 4.7.--Mean MEAP math scores of special education students, by impairment category, for whom the mechanics of the MEAP test were judged appropriate and not appropriate.

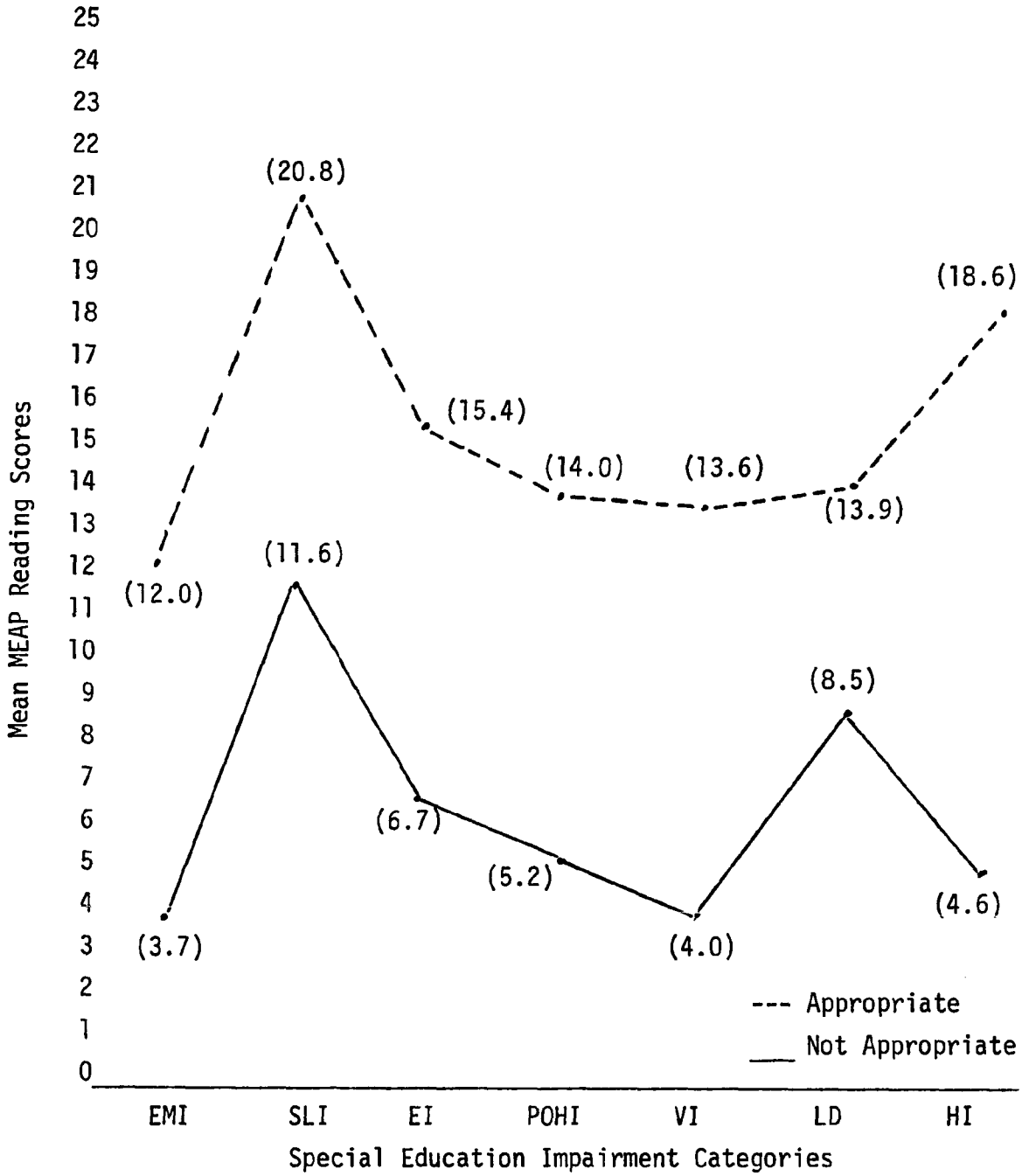


Figure 4.8.--Mean MEAP reading scores of special education students, by impairment category, for whom mechanics of the MEAP test were judged appropriate and not appropriate.

Table 4.37.--Distribution of special education students, by impairment category, for whom the mechanics of the MEAP test were judged appropriate and not appropriate, and their inclusion in or exclusion from the MEAP summary report.

Impairment Category	Include	Exclude	Total No. by Category	% of Include	% of Exclude
Appropriate					
Educable mentally impaired (EMI)	1	..	1	100.00%	...
Speech and language impaired (SLI)	24	1	25	96.00%	4.00%
Emotionally impaired (EI)	31	21	52	59.60%	40.40%
Physically or otherwise health impaired (POHI)	3	2	5	60.00%	40.00%
Visually impaired (VI)	3	..	3	100.00%	...
Learning disabled (LD)	91	25	116	78.45%	21.55%
Hearing impaired (HI)	7	1	8	87.50%	12.50%
Totals	160	50	210	76.20%	23.80%
Not Appropriate					
Educable mentally impaired (EMI)	..	81	81	...	100.0%
Speech and language impaired (SLI)	3	3	6	50.0%	50.0%
Emotionally impaired (EI)	10	76	86	11.6%	88.4%
Physically or otherwise health impaired (POHI)	..	4	4	...	100.0%
Visually impaired (VI)	..	1	1	...	100.0%
Learning disabled (LD)	55	296	351	15.7%	84.3%
Hearing impaired (HI)	..	3	3	...	100.0%
Totals	68	464	532	13.0%	87.0%

Table 4.37.--Continued.

Impairment Category	Total No. in Category	Total # Include	% of Include	Total # Exclude	% of Exclude
For Both Appropriate and Not Appropriate					
Educable mentally impaired (EMI)	82	1	1.2%	81	98.8%
Speech and language impaired (SLI)	31	27	87.1%	4	12.9%
Emotionally impaired (EI)	138	41	29.7%	97	70.3%
Physically or otherwise health impaired (POHI)	9	3	33.3%	6	66.6%
Visually impaired (VI)	4	3	75.0%	1	25.0%
Learning disabled (LD)	467	146	31.3%	321	68.7%
Hearing impaired (HI)	11	7	63.6%	4	36.4%
Totals	742	228	30.7%	514	69.3%

Table 4.38 provides a distribution of special education students, by impairment category, who were eligible to be included in or excluded from the MEAP test. Students included in the MEAP test are those who receive 50% or more of their reading/English instruction in general education. For each category listed in the table, the percentages of the total number of special education students included and excluded are also listed.

Table 4.38.--Distribution of special education students, by impairment category, of the total number of special education students typically included in or excluded from the MEAP test.

Impairment Category	Total Number	Include	% of Include Total	Exclude	% of Exclude Total
Educable mentally impaired (EMI)	82	1	.4%	81	15.8%
Speech and language impaired (SLI)	31	27	11.8%	4	.8%
Emotionally impaired (EI)	138	41	17.9%	97	18.9%
Physically or otherwise health impaired impaired (POHI)	9	3	1.3%	6	1.2%
Visually impaired (VI)	4	3	1.3%	1	.1%
Learning disabled (LD)	467	146	63.8%	321	62.5%
Hearing impaired (HI)	11	7	3.1%	4	.8%
Totals	742	228	100.0%	514	100.0%

Summary of Findings

The following major findings emerged from the analysis of data.

1. In all comparisons in which significant differences were found regarding the percentage of instruction, the mean score differences favored those special education students receiving the greatest amount of instruction in the general education program. In all

cases, the special education students receiving the greatest amount of their reading or math instruction in the general education program had higher raw mean MEAP scores.

2. In regard to the criteria for special education students being included in (receiving less than 50% of their reading/English instruction in special education) or excluded from (receiving more than 50% of their reading/English instruction in special education) the MEAP test, 30.7% of the seven categories of special education students participating in this study were eligible for inclusion in the MEAP test, whereas 69.3% would typically be excluded from the test.

3. Of the 30.7% special education students eligible to be included in the MEAP test, learning disabled students constituted the largest portion of the group, having 63.7% of the total; educable mentally impaired had the smallest portion of the total, at .4%.

4. Of the 30.7% of special education students eligible for inclusion in the MEAP test, the proctors judged the mechanics of the MEAP test to be appropriate for 70.2% of these students and not appropriate for 29.8%. Of the 69.3% special education students typically excluded from the MEAP test, the proctors judged the mechanics of the MEAP test to be appropriate for 9.7% and not appropriate for 90.3% of these students.

5. Special education students for whom the MEAP proctors judged the mechanics of the MEAP test to be appropriate scored significantly higher in both math and reading on the MEAP test than did special education students for whom the test mechanics were judged not appropriate.

6. Learning disabled students who were eligible for inclusion in the MEAP test (receiving more than 50% of their reading/English instruction in general education) scored significantly higher on the MEAP test than did learning disabled students who would normally be excluded from the MEAP test (receiving less than 50% of their reading/English instruction in general education).

7. Emotionally impaired students who were eligible for inclusion in the MEAP test (receiving more than 50% of their reading/English instruction in general education) did not score significantly higher on the MEAP reading or math tests than did emotionally impaired students who would normally be excluded from the MEAP test (receiving less than 50% of their reading/English instruction in general education).

8. Emotionally impaired students eligible for inclusion in the MEAP test who received 0-9% of their reading/English instruction in special education scored significantly higher on the MEAP math and reading tests than did emotionally impaired students who received 90-100% of their reading/English instruction in special education (who would normally be excluded from the MEAP test).

9. A majority of the fourth-grade special education students in this study (74.6% for reading, 77.7% for math) were reported in the two extremes of percentage of special education math or reading instruction times: minimal (0-9%) and maximal (90-100%). Of the 74.6% of special education students, 18.6% were reported in the minimal (0-9%) and 56% in the maximal (90-100%) categories of percentage of reading/English instruction in special education. Of the 77.7% of

special education students, 33.8% were reported in the minimal (0-9%) and 43.9% in the maximal (90-100%) categories of percentage of math instruction in special education.

10. The educable mentally impaired group had the highest percentage (87.6% for reading, 86.4% for math) of its total number of students in the maximal (90-100%) percentage of math or reading instruction in special education.

11. The speech and language impaired group had the highest percentage (90.3% for reading, 90.3% for math) of its total number of students in the minimal (0-9%) percentage of math or reading instruction in special education.

12. Special education students receiving minimal (0-9%) as compared to those receiving maximal (90-100%) math or reading instruction in special education scored higher on both the MEAP math and reading tests. Figures 4.3, 4.4, 4.5, and 4.6 displayed the differences in mean MEAP reading and math scores between these groups.

13. Specific findings about individual impairment groups are listed below:

a. Special education students from different impairment groups scored differently on both the MEAP reading and math tests.

b. Educable mentally impaired students scored lowest of all the impairment groups on the MEAP reading and math tests.

c. Speech and language impaired students scored highest of all the impairment groups on the MEAP reading and math tests.

d. Speech and language impaired, emotionally impaired, learning disabled, and hearing impaired students scored similarly on the MEAP reading test.

e. Speech and language impaired, emotionally impaired, physically or otherwise health impaired, visually impaired, learning disabled, and hearing impaired students scored similarly on the MEAP math test.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

Introduction

This chapter contains a summary of the study, as well as the results of the study. The limitations of the study are also discussed. Recommendations for the Michigan Educational Assessment Program and for further research are offered.

Summary

The purpose of this study was to examine the appropriateness of the existing criteria for special education students participating in the Michigan Educational Assessment Program (MEAP) test. Little research has been done to evaluate the MEAP inclusion criteria and their applicability to assessing special education students' level of achievement in basic skills.

In this study an attempt was made to answer the following research questions:

1. Do special education students from different impairment groups score differently in the areas of reading and math on the MEAP test?

2. Is there a difference in mean MEAP reading scores of special education students receiving different percentages of reading or math instruction in special education?

3. Is there a difference in mean MEAP math scores of special education students receiving different percentages of reading or math instruction in special education?

4. To what degree do the mechanics of test taking and the special education students' ability to understand the directions for responding to questions, as assessed by MEAP proctors, affect the students' performance on the MEAP reading and/or math tests?

A total of 751 fourth-grade special education students from 97 of Michigan's 530 K-12 school districts participated in this study. To assure the generalizability of the study findings, a systematic stratification method was used in selecting the 97 districts for study. Seven categories of special education students participated in the study: educable mentally impaired, speech and language impaired, emotionally impaired, physically or otherwise health impaired, visually impaired, learning disabled, and hearing impaired. All special education students from the 97 sampled districts were to be included in the study.

The independent variables were the seven impairment groups, the percentage of reading and math instruction in special education, and the MEAP proctors' judgment of whether the mechanics of the MEAP test were appropriate for the students. The dependent variables were the MEAP reading and math scores.

The data gathered from this study were analyzed and statistical hypotheses tested through a series of one-way analyses of variance. F-ratios with statistical levels of alpha = .05 were

accepted as statistically significant for this study. Planned comparisons were used to examine relationships among levels of independent variables. The overall findings suggested that special education students from various disability groups scored differently on the MEAP reading and math tests. Additional findings indicated that special education students receiving a majority of their reading and/or math instruction in the general education classroom scored significantly higher on the MEAP reading and math tests than did special education students receiving a majority of their math and reading instruction in special education classrooms. Examination of student scores on the MEAP test indicated that the proctors could accurately identify the students who had difficulty handling the mechanics of the MEAP test.

Based on these findings and the distribution of students according to percentage of reading or math instruction times, the present inclusion criteria for the MEAP test seem to be appropriate.

Results

1. Special education students from different impairment groups scored differently in the areas of reading and math on the MEAP test.

Hypotheses 1 and 2 were formulated to test the data regarding the first research question. There were two significant findings pertaining to these hypotheses.

The first important finding was that educable mentally impaired (EMI) students as a group accounted for the significant

differences in MEAP scores because their math and reading scores were lower than those of all other impairment categories. These results may be expected in view of the fact that EMI students qualify for special education services based on their lower intellectual functioning. It must be pointed out that these results were based on comparisons with EMI students of whom 1 out of 82 met the criteria for inclusion in the MEAP test. To elaborate on this point, 71 of the 81 students not meeting the criteria for the MEAP received 90-100% of their reading instruction in special education. This percentage was similar in the math area, in which 69 of the 81 EMI students received 90-100% of their math instruction in special education.

The information gathered regarding EMI students, based on their not meeting the criteria for inclusion in the MEAP test, would indicate that their basic-skills identification and attainment is the main responsibility of the special education program, as established by their individualized educational planning committee. Considering the number of EMI students who are receiving their total reading and/or math instruction in special education, these results seem very appropriate and predictable. However, it is interesting that such a large number of EMI students on a statewide basis are receiving their total reading and/or math instruction in special education. This researcher, through this study, cannot identify why so few EMI students are being integrated into the general education reading and/or math program. However, answers to the following questions may provide insight into the situation.

1. Are EMI students as a whole truly functioning at such a low academic level that their integration into the general education reading and math programs is not possible?

2. Are specific reading and math programming techniques taking place at the first-, second-, and third-grade levels that complement the general education curriculum, thus building a support system by which integration of EMI students could take place?

3. Are the philosophy and program design at the early-elementary level conducive to EMI students' being integrated into the general education reading and math programs?

4. Are elementary special education teachers, in general, highly equipped with remedial and intensive reading and math instruction skills that would allow for a larger number of EMI students to progress more rapidly in the areas of reading and math and thus enhance their opportunities for integration?

These four questions are raised initially to pursue the reasons for the minimal integration of EMI students into the general education program. The study results in this area were quite enlightening. The researcher believes that greater integration could take place if there were more continuity of programming between the special and general education programs.

The second important finding regarding the differences in MEAP reading and math scores is that both emotionally impaired (EI) and learning disabled (LD) students scored significantly lower than speech and language impaired (SLI) students on the MEAP reading and

math tests. Comparisons between the categories may provide some insight into the reasons for this outcome. Of the SLI students participating in the study, 90% received all of their reading and math instruction in general education. On the other hand, 23.5% of the EI students and 26.5% of the LD students received their reading and math instruction totally in general education. SLI students receive their special education service on a support basis and their disability may not have a great effect on their academic functioning, whereas EI and LD students require much more intense service and their needs can have a greater influence on their academic functioning.

The findings relating to this research question support the appropriateness of the existing inclusion criteria for special education students participating in the MEAP test. The inclusion criteria, through the requirement of all students receiving a certain level of reading/English instruction in the general education program, do take into consideration the differences between special education impairment categories. The criteria also assure that handicapped students' rights as described in Section 504 of the Rehabilitation Act of 1973, which mandates nondiscrimination on the basis of handicap in testing situations, are not violated.

2. There was a difference in mean MEAP reading scores for special education students receiving different percentages of reading and/or math instruction in special education.

Hypothesis 3 was formulated to test the data regarding the second research question. There were four major findings regarding this hypothesis.

The first finding was that there was not an equal distribution of special education students across various percentages of reading and/or math instruction in special education. This necessitated two specially arranged comparisons: one within the emotionally impaired and learning disabled categories and the other within the speech and language impaired, emotionally impaired, physically or otherwise health impaired, learning disabled, and hearing impaired categories. The results indicated that a majority of all the special education students from each category were receiving most of their reading and/or math instruction in either special or general education. This particular finding seemed surprising from the mere fact that the state of Michigan emphasizes the "least restrictive alternative" in programming for special education students, which should allow for a greater continuum of services.

This finding indicates that fourth-grade special education students in Michigan are receiving their reading and math instruction almost totally in an "either (general education)/or (special education)" situation and that a limited continuum of mainstreaming is taking place for reading and/or math. However, the writer is not convinced this is a true picture of what takes place throughout the school year because two basic philosophies are practiced regarding mainstreaming special education students. Some educators feel special education

students should initially be placed in the special education classroom and then mainstreamed out on a gradual basis. On the other hand, there are those who feel special education students should initially be placed in the general education classroom to the maximum extent possible and not placed into special education classrooms unless the support resources available to the general education program are exhausted in assisting those students to have a successful experience.

The findings of this study did indicate that fourth-grade special education students, on the whole, are not going to qualify for inclusion in the MEAP test, based on the present criteria. As a result, neither special nor general educators will have an objective measure by which to see how the special education students are functioning in comparison to their general education peers.

The second finding in regard to Hypothesis 3 was that emotionally impaired (EI) students receiving 0-49% of their math instruction in special education scored significantly higher on the MEAP reading test than did EI students who received 50-100% of their math instruction in special education. For EI students the mean reading score was higher for those receiving 0-49% of their reading instruction in special education than for those receiving 50-100% reading instruction in special education, but the difference was not statistically significant. These results may indicate that there is a more equal distribution of EI students' academic functioning in reading than in math. This would indicate a lack of significance in the reading area because there was not such an extreme range of performance abilities.

However, in regard to percentage of math instruction significantly affecting reading scores, one might speculate that those EI students who received 0-49% of their math instruction in special education probably were highly integrated into the general education program as a whole and thus would probably score significantly higher than those EI students who were not as totally integrated.

The third finding concerning Hypothesis 3 was that learning disabled (LD) students receiving 0-49% of their reading instruction in special education scored significantly higher on the MEAP reading test than did LD students receiving 50-100% of their reading instruction in special education. This finding seems logical because many of the LD students have vast needs in the area of reading. It might be expected that those LD students receiving over 50% of their reading instruction in the general education program would perform significantly better on the MEAP reading test because their learning disability may not be as severe as the LD students receiving over 50% of their reading instruction in the special education program. However, this finding should not be accepted as fact but should only establish a challenge of how educators can narrow this gap.

The fourth finding concerns comparisons that were made within five categories of special education students (speech and language impaired, emotionally impaired, physically or otherwise impaired, learning disabled, and hearing impaired): between those receiving 0-9% (minimal) versus 90-100% (maximal) reading and/or math instruction in special education and the students' corresponding mean MEAP

reading scores. The reason for including just the two extreme instructional times and five of the seven categories in the comparison is that the student distribution only allowed for such a comparison to take place. The major finding was that in three of the five categories (EI, POHI, and LD), those students receiving minimal reading and math instruction in special education scored significantly higher on the MEAP reading and math tests, respectively, than did students receiving maximal instruction in these subjects. However, this was not the case for SLI and HI students. The comparison between SLI students (N = 28 vs. 2) and HI students (N = 1 vs. 9) led one to believe that if the N's had been more equal the results probably would have been the same as for the other categories.

These results raised three interesting questions:

1. Are the ability levels of special education students receiving a majority of their reading and/or math instruction in general education of a much higher level than those of students receiving most of their reading and/or math instruction in special education, thus enabling them to score score significantly higher on the MEAP test?

2. Are the special education reading and math curricula covering the minimum objectives being tested by the fourth-grade MEAP test?

3. If more special education students were integrated into the general education reading and/or math programs, could an increase in their MEAP performance be expected?

The analysis for Hypothesis 3 compared the two extremes (minimal vs. maximal) of reading and/or math instruction in special education. The analysis did reveal that special education students are receiving a majority of their reading and/or math instruction in either special or general education. If educators' ultimate goal is to have special education students participate in and perform to the best of their ability on the MEAP test, this finding provides valuable information about how to achieve that goal. First of all, if special education students who are maximally integrated score significantly higher than those who are not, ways must be found to allow more special education students to be successfully integrated into general education reading and math classes and thus accomplish two goals: greater participation and better performance.

A second aspect of this analysis that needs the attention of educators regarding special education students' participation in and performance on the MEAP is that many special education students are receiving their reading or math instruction either totally in general education or totally in special education. The writer believes this separate approach has been brought about by educators' feeling that special education students need "special instruction" with which general educators cannot deal. As a result, special educators have retreated into their classrooms to provide individualized instruction, not considering the general education curriculum. Conversely, general educators have become hesitant to take special education students because they do not know what general-education-curriculum goals have been emphasized in the special education individualized instruction.

The third insight provided by this analysis is the importance of early intervention. The results of this study indicated that fourth-grade special education students on the whole are receiving minimal reading and/or math instruction in general education and participate minimally in the fourth-grade MEAP test. When they do participate in the MEAP test, there is a distinct difference in performance between those integrated and nonintegrated into general education. Therefore, fourth-grade special education students, on the whole, may be significantly behind their general education peers, especially in relation to the basic skills measured in the MEAP test. This information raises two important questions:

1. If special education students are functioning significantly behind their general education peers at the fourth-grade level, is this an indication that these students will continue to be significantly behind as their school years progress?

2. Are there additional strategies or programmatic designs that would allow K-3 special education students to be better prepared for integration into general education classes and participation in the MEAP, and thus reduce the gap between general and special education students?

More emphasis should be placed on the preprimary through sixth-grade programming for special education students, stressing that professionals look at extensive diagnostic, prescriptive, and evaluation-of-instruction techniques that would allow special education students the maximum opportunity to be as equally prepared for the future as their general education peers. This should not just

take place in the areas of reading and math but extend across the entire school program. Special and general education staff members should work together to develop this approach so that each group understands the total educational perspective. Adopting such an attitude could foster development of effective early intervention strategies that would facilitate the appropriate approaches and communication to allow special education students the maximum opportunity to participate and perform in the general education mainstream.

The findings relating to the second research question support the appropriateness of the existing inclusion criteria for special education students participating in the MEAP test. In the case of learning disabled students, who had the largest representation in various general education reading/English instructional times, the results indicated that there was a performance distinction for these students at the 50% of general education reading/English inclusion-criterion point. For the other impairment categories on which analyses were conducted, special education students receiving minimal (0-9%) reading and/or math instruction in special education scored significantly higher on the MEAP reading test than did those special education students receiving maximal (90-100%) reading and/or math instruction in special education. Based on these results, an alternative criterion cannot be suggested. Because a majority of the special education students received their reading and/or math instruction almost totally in either the special or general education classroom, the 50% of general education reading/English instruction inclusion criterion seems appropriate.

3. There was a difference in mean MEAP math scores for special education students receiving different percentages of reading and/or math instruction in special education.

Hypothesis 4 was formulated to test the data regarding the third research question. There were four major findings concerning this hypothesis.

The first finding is that there was not an equal distribution of special education students among the percentages of reading and math instruction in special education. Therefore, specially designed comparisons within the categories of emotionally impaired (EI) and learning disabled (LD) were conducted, and an additional specially designed comparison was conducted within the speech and language impaired (SLI), emotionally impaired (EI), physically or otherwise health impaired (POHI), hearing impaired (HI), and learning disabled (LD) categories.

The second finding was that EI students receiving 0-29% of their math instruction in special education scored significantly higher on the MEAP math portion of the test than did El students receiving 30-49% of their math instruction in special education. This information provides insight into the fact that the more math instruction in the general education class EI students received, the better they scored. This specific difference in scoring of EI students might be related to the point that EI students who are more integrated into general education classes do not have their emotional needs affecting academic performance as do those needing more special education basic-classroom support. This speculation may be

carried one step further to the possibility that the special education teachers for the EI students may be spending more time on emphasizing social and behavioral skills to meet the EI students' needs so that they can function successfully in the general education classroom. Therefore, the special education teachers cannot provide math instruction in the same depth as the general education teacher can, so the highly math-integrated EI student scores significantly higher than the marginally math-integrated EI student.

It is also important to note that there was not a significant difference in MEAP math scores for EI students receiving 0-49% versus 50-100% of their reading instruction in special education. This is pointed out because the 50% reading/English instruction in general education is the cut-off point for students being included in the MEAP test. For EI students, in this case, the data did not display that they would score better on the math test than those receiving 49% or less reading/English instruction in general education.

The third finding indicates that LD students receiving 0-49% of their reading instruction in special education scored significantly higher on the MEAP math test than did LD students receiving 50-100% of their reading instruction in special education. One might assume that the LD students who fell into this category were many of the students who shared the similar significant results on the MEAP reading test. This would indicate that those LD students who were less integrated had problems in both the reading and math areas and functioned lower in both areas than those less severely impaired LD

students who were more integrated. However, continuous review of diagnostic, prescriptive, and evaluation-of-instruction approaches can provide educators with more insight into how to reduce this gap.

The fourth finding indicated that two (EI, LD) of the five special education categories (SLI, EI, POHI, LD, HI) receiving 0-9% (minimal) reading and/or math instruction in special education scored significantly higher on the MEAP math test than EI or LD students receiving 90-100% (maximal) reading and/or math instruction in special education. This finding is consistent with the fact that those students needing more basic special-education-classroom help scored lower on the MEAP test than those highly integrated students. For POHI students, there was no indication of a significant difference in MEAP math scores based on 0-9% (minimal) versus 90-100% (maximal) math instruction in special education. However, there was a very close indication of a significant difference in MEAP math scores for those POHI students receiving 0-9% (minimal) versus 90-100% (maximal) reading instruction in special education. It might be assumed that any real difference, if present, was between the more severely physically and academically involved POHI child and the not as severely impaired child.

SLI and HI students did not show significant differences between the minimal and maximal reading and/or math special education instructional comparisons, but it was assumed this result was due to the low N's involved (SLI N = 28 vs. 2; HI N = 2 vs. 9).

Once again, the researcher emphasizes the importance of evaluative, instructional, integrative, and communicative strategies

between both special and general educators, which will allow improvements for special education students in the area of math also. The early intervention strategies, using all resources, will benefit the special education child as a total student, thus allowing him/her to grow in all areas--academic, social, and emotional.

The third research question, along with the hypothesis, was designed to explore whether the current MEAP inclusion criteria, based on the percentage of reading/English instruction in general education, were supported by students' math performance as being appropriate. As indicated by the results of this study, special education students' integration into the general education program and their performance on the MEAP math test were similar to what was found in the reading area. Because a majority of the special education students received their reading and/or math instruction almost totally in either the special or the general education classroom, the criterion of receiving 50% of one's reading/English instruction in general education seems appropriate. Because of the limited distribution of general education students in the various percentage-of-integration times and lack of significant findings to consider the possibility of a math inclusion criterion, maintaining the present curriculum standard of reading/English in the inclusion policy also seems appropriate.

4. Based on the MEAP proctors' assessment, the mechanics of test taking and the special education students' ability to understand the directions for responding to questions did have an effect on the students' MEAP math and/or reading test performance.

Hypothesis 5 was formulated to test the data regarding the fourth research question. The findings were as follows.

The analysis of the data from this study indicated that special education students judged by MEAP proctors as capable of handling the mechanics of the MEAP test scored significantly higher on the test than those special education students judged not able to handle the test mechanics. In analyzing the MEAP proctors' judgments, by special education category, it was interesting that for both the emotionally impaired (EI) and learning disabled (LD) categories a portion of students who typically would be excluded from the MEAP test were judged capable of handling the mechanics of the test. Also, a group typically included in the MEAP test were judged not capable of handling the test mechanics. Of the EI students judged capable, 40.4% would ordinarily be excluded from the test, and of the LD students, 21.55%. Although information could not be gathered on how these two groups of students actually performed on the MEAP test, one might assume that these students would appear on the surface to be able to handle the test. This information could be carried beyond the MEAP test and possibly into the general or special education classroom setting. These data, when expanded, could tell educators that approximately one-third of the LD students and two-thirds of the EI students appear on the surface to be capable of handling their school work but in reality may need some special attention. This information should reinforce the fact that extensive evaluation and monitoring techniques need to be employed in classrooms so that special

education and especially general education teachers are not fooled by student appearance.

On the other hand, 11.6% of the EI students and 15.7% of the LD students who ordinarily would be included in the MEAP test were judged not capable of handling the test mechanics. Again, without the ability to obtain actual test scores for these students, one can only speculate about these results. However, this information might indicate that some EI and/or LD students may be appropriately integrated into the general education classroom but may evidence frustration concerning test taking or similar activities.

The other aspect of this information that may be helpful to educators is the fact that many behaviors indicating a student's frustration in test taking can be identified, as shown by the apparent validity of the proctors' judgments. These behaviors could be analyzed and effective intervention strategies provided, which might help students lessen some of those frustrations and thus allow them to become more self-confident in similar situations. One builds a student's confidence in an activity by totally preparing him/her for the activity and by providing positive reinforcement and encouragement so the student can develop self-confidence about the activity. It would be interesting to know to what extent the fourth-grade special education students had been exposed to the structure of the MEAP test and how familiar they were with the types of test items. These two factors could affect the frustration level of students taking the MEAP test.

The fourth research question and its corresponding hypothesis were designed to provide an additional measure, through the MEAP

proctors' observations of the students, of whether those students typically included in the MEAP test evidenced behaviors that indicated their ability to handle the mechanics of the MEAP test. Based on the students' scores and the MEAP proctors' judgments, results relating to this question indicated that those students typically included in the MEAP test displayed behaviors that indicated they were able to handle the test mechanics, whereas those students not typically included in the MEAP test displayed behaviors that indicated they could not handle the test mechanics.

These results support the idea that students participating in the MEAP test are prepared to handle the mechanics of the test and that the current inclusion criteria are appropriate for distinguishing between those students who are and are not capable of handling the MEAP test mechanics.

It is very important to point out that the results of this study relate specifically to the areas of reading and math, and the data should not be taken to the extent that one would assume that extreme efforts of integrating special education students into these two areas would result in higher MEAP scores. One must take into account the other variables that allow a special education student to be successfully integrated, such as social and behavioral skills. EMI students, for example, may be integrated into nonacademic areas initially to develop the necessary social and behavioral skills so the appropriate integration can be facilitated. It should be understood that increased integration into general education reading or math is not the complete answer to improvement of MEAP scores.

Discussion of Limitations of the Study

This section contains an appraisal of the limitations of the study. Because the research focused on a large number of school districts throughout Michigan, it was not physically possible for the researcher to visit and monitor each school district while the MEAP testing was taking place. Consequently, several limitations should be considered.

1. It was not possible to determine or evaluate the procedures by which handicapped students were integrated into the general education programs throughout the state. These varying integration standards could influence the interpretation of the MEAP test results.

2. The time of day, testing atmosphere, and test-delivery style may have been positively and/or negatively influencing factors that were beyond the researcher's control.

3. In districts throughout the state there may be varying attitudes toward and support of special education programs, which may result in some districts having relatively more resources available to special and general education programs. These variations may influence the students' test results.

4. The curriculum in some districts may correlate better with the MEAP test than in other districts. Also, emphasis on and experience in testing may be greater in some districts than in others. This, too, could influence special education students' test scores.

5. It was not possible to analyze the type and amount of support given special education students in the MEAP testing process.

Therefore, it could not be determined if some special education students received more support in the test-taking process than others.

6. It was not possible to determine if the MEAP coordinators made sure that all eligible special education students participated in taking the MEAP test.

7. This study addressed only the areas of reading and math; therefore, it was not possible to assess the effect the integration of special education students into other academic and nonacademic areas had on their MEAP performance.

Discussion of Related Issues

One major question warrants further discussion, and from this question several related issues evolve. That is, if special education students are to be included in a state assessment or minimum competency test, what variables are important for educators and policy makers to take into account in order to make the testing experience valuable for both the special education student and school-district staff?

In an effort to have handicapped students successfully involved in a state assessment or minimum competency testing program, the first thing that educators and policy makers must take into account is clearly defining the purpose of the basic-skills assessment and how it relates to the involvement of handicapped students in the testing.

In some cases, the students' individualized educational plan and evaluation measures are used as a supplement to or in place

of a basic-skills-assessment test. Although the individualized educational plan provides valuable individualized information on special education students, it is not the same as a basic-skills assessment or minimum competency test because it may not have the same influence as the assessment or minimum competency tests on the curriculum continuity among classrooms, buildings, districts, or the state as a whole. Therefore, there is no common set of basic skills that all special education students should acquire. For this reason, it is important for those special education students capable of participating in the state assessment or minimum competency test to do so and not to be deprived of that right based on the fact that they have an individualized educational plan. However, it is important that educators use the information from the individualized educational plan to supplement the basic-skills information obtained on special education students.

Another factor that is important in attempting to have handicapped students successfully involved in a state assessment or minimum competency testing program is to define clearly those students for whom the test is appropriate. Ewing and Smith (1981) described how special education students fall into one of two groups when participating in a minimum competency testing situation. The groups are:

1. handicapped students who require a modification of the learning environment,
2. handicapped students who require a modified curriculum and instructional goals. (p. 523)

To expand on these groupings, the following is suggested:

For those students needing a modification of the learning environment, curriculum and instructional goals are essentially the same as for their nonhandicapped peers. They would participate in the same basic-skills test, and appropriate special accommodations would be available for them.

For handicapped students who require a modified curriculum and instructional goals, the same assessment or competency test should not be applied as is used with nonhandicapped students. A determination would need to be made as to which special education students would participate in the assessment or minimum competency test. The determination would have to be continually reviewed to be sure it was working to the benefit of the handicapped student.

For the more severely impaired special education students, the assessment or minimum competency test would be totally inappropriate. That is, their program is so different from that of their general education peers that they could not begin to approach the development of skills needed to participate in the test. For these students, total exemption from the test is appropriate. However, curriculum goal statements should be established for these students so that educators consistently understand, evaluate, and improve upon the basic-skills program, thus emphasizing the point that basic-skills education is important for all students and that the only way progress is to be made is if goals are established and evaluated and programming improved.

Another important factor that can influence how educators and policy makers view the involvement of handicapped students in

an assessment or minimum competency test is the media coverage relating to how the basic-skills-attainment results for classrooms, buildings, and school districts are publicized. The image of a school district, perceived from a media report about test scores and student gains, may not reflect what is actually taking place in that district. Such perceptions cause some educators to question whether handicapped students should be involved in the assessment or minimum competency testing because they feel special education students are pulling down the average scores and thus providing an inappropriate image of their classroom, building, or district to the community. This may or may not be the case. However, it should be recognized that basic-skills education and the assessment of acquired skills are for all students, and many factors may cause lower scores in a given year. Some of these may be a change in school boundaries that would alter the student population, a large family-relocation pattern, poor third-grade basic-skills instruction, and so on.

Caution must be taken to ensure that handicapped students are not used as a solution to a publicity problem. Efforts should be made to recognize those districts that have made true basic-skills-education gains, although many variables may make this a monumental task. In essence, districts with a large concentration of special education students may be doing a much finer job of teaching basic skills to all of their students, considering the special needs of their population.

The media pressures, in some cases, raise the question of whether it is advantageous to include special education students in

state assessment or minimum competency testing programs. This concern arises because the results of the state assessment or minimum competency test are used for some of the following purposes:

1. Making comparisons between the different classrooms, school buildings, or school systems as to their students' basic-skills attainment. The assessment results for handicapped students should not be used for this purpose because comparisons among small units and numbers of students are even less valid than among large units such as general education. One additional factor to take into account is that the assessment tests are often given at the beginning of the school year, and the teachers may have had very little opportunity to teach their students the basic skills being tested. Results of these tests reflect the basic-skills attainment from the students' previous years of education and not from the current year.

2. Making comparisons among teachers to judge their effectiveness, based on their students' basic-skills attainment. This reasoning is not valid because teachers do not receive students who have equal amounts of basic-skills knowledge or potential to learn the basic skills. Once again, it is important to point out that a student's present teacher cannot be held accountable for that student's basic-skills attainment without taking into account the previous instruction the child has received.

3. Using the test results for promotion or graduation purposes. The assumption behind using test results for such purposes

is that all students are capable of achieving a certain minimum standard.

4. Using the test results to determine whether a given student needs special help or remediation. This purpose is effective for those students participating in the general or special education program. However, it is essential for educators to use the individualized educational planning committee's information along with the state assessment test data to obtain a total perspective of the special education student's functioning and thus appropriately plan for how the student can most effectively participate in the least restrictive environment.

The purposes for which the basic-skills data on all students are used can help determine for whom the information will be of greatest value. If the results are used for some of the previously stated purposes, handicapped students, in particular, may lose out just so teachers, building administrators, and school-district personnel can report higher basic-skills-attainment information.

The last factor to be addressed regarding educators and policy makers successfully including handicapped students in an assessment or minimum competency test for the benefit of both the student and the district is evaluation of handicapped students' performance on the assessment test and how such evaluation relates to the instruction they are receiving. This factor will be discussed as it relates to the present study. To reiterate some of this study's findings, a majority of the special education students received their reading and/or math instruction almost totally in either the special

or general education program. Also, the special education students mainly participating in the general education reading and/or math program scored significantly higher on the MEAP test. These results may be attributed to several different factors.

One factor may be that the special education students who are integrated into the general education program are more capable than those not integrated into general education. This may be the case, but for those students to perform significantly higher they must have been exposed to the information tested through their curriculum program. This may be more easily accomplished in the general education classroom than in the special education classroom. Several factors may affect the special education teachers' ability to include the same basic-skills education as their general education counterparts. Some of these might be:

1. Special education teachers may have students from various grades and ability levels, with specific individual needs, thus requiring them to devote special attention to behavioral strategies, special remedial instructional materials and activities, and so on, which may interfere with a straightforward reading and/or math curriculum that complements the general education program and thus supports the items tested on the MEAP.

2. A lack of continuity may exist between the special and general education curricula. The special education curriculum must complement the general education curriculum so that special education students can have a smooth transition into the general education program, when appropriate. This point is very important because the

general education curriculum emphasizes the basic skills assessed in the MEAP, and unless the curricula allow a smooth transition for special education students, these children may not enter the general education classroom or the MEAP with the basic skills needed for them to have a successful experience.

3. Special education teachers may not be familiar with the basic skills tested in the MEAP or emphasize incorporating these skills into their curriculum because only a few of their students participate in the MEAP testing. Furthermore, special education teachers may not feel the MEAP test is a valuable tool for them because several other assessment measures are used with their students, on which curriculum and instructional strategies are based.

There are several possible reasons why special education students who were highly integrated into the general education program scored significantly better on the MEAP test than those students receiving a majority of their instruction in special education classrooms. Some of these reasons might be as follows:

1. The higher capabilities of the integrated special education student.

2. The MEAP basic-skills emphasis in the general education reading and math curricula.

3. The general education classroom expectations, challenge, social integration, and other factors that may help a special education student develop a strong self-image, which might allow him/her to perform to the fullest capacity.

4. The opportunity for general education teachers to review and re-emphasize the basic-skills areas because of moving more rapidly through the general education curriculum.

Several factors have been mentioned that may have contributed to the fact that special education students who were highly integrated into the general education reading and/or math programs scored significantly higher on the MEAP reading and/or math test than those students who received a majority of their reading and/or math instruction in special education. One could rationalize and accept these results; however, this researcher believes that more special education students could participate in the MEAP test and that educators could narrow the performance gap between those who do and do not participate in the MEAP. This study has provided a base of information from which further analysis and action can begin to accomplish such a goal. Two basic suggestions are:

1. The special education curriculum should be analyzed to identify where, when, and how the basic skills assessed in the MEAP are taught.

2. Strategies should be established to analyze the available resources and continuity of the general and special education curricula. Once these elements are realistically defined and the special education programs complement and support the general education programs, more special education students will have an opportunity for integration into general education and thus be able to be successfully involved in the state assessment program.

If one were to expand on the findings of this study, it could be said that the more instruction special education students receive in general education reading and/or math classes, the better their MEAP scores will be. This phenomenon may be true, but certain academic, behavioral, and social skills are needed for successful integration to take place. Major efforts need to be made to facilitate these accomplishments so that special education students can participate in the general education program and perhaps acquire the basic skills necessary for them to function comparably with their general education peers.

Several factors that may have an influence on making an assessment or minimum competency test a valuable experience for both the special education student and school district staff were described in this section. These factors were discussed because special education students will be participating in state assessment or minimum competency testing programs. These related issues were included in an attempt to offer an additional perspective on the information reported in this study.

Recommendations

The following recommendations are presented in two specific categories: recommendations for the State of Michigan Educational Assessment Program and recommendations for further research.

Recommendations for the State of Michigan Educational Assessment Program

One purpose of this study was to analyze the appropriateness of the criteria for inclusion of special education students in the Michigan Educational Assessment Program (MEAP) at the fourth-grade level. The recommendations that follow address several aspects of the inclusion criteria and provide suggestions that may enhance handicapped students' opportunities to participate appropriately in the MEAP test.

1. The present criteria for the inclusion of special education students in the MEAP test should be maintained. This recommendation is based on the following major discoveries of the study:

A majority of the special education students from each impairment category were reported to be receiving a large amount of their math and/or reading instruction in special education at either the minimal (0-9%) or the maximal (90-100%) instruction levels. This indicates that a majority of the fourth-grade special education students in Michigan are being served almost totally in special education or almost totally in general education for math and reading instruction. Because a majority of special education students receive instruction at the two extremes, comparisons between mean MEAP math and reading scores to determine alternative criteria for inclusion in the MEAP could only be conducted between emotionally impaired (EI) and learning disabled (LD) students receiving 0-49% versus 50-100% math or reading instruction in special education. The

significant findings in these comparisons could not discount the current MEAP inclusion criteria for students receiving more than 50% of their reading/English instruction in general education but could only suggest that the present criteria are the fairest. However, some disability groups, such as educable mentally impaired (EMI) students, may continuously be excluded from participating in the MEAP because a majority of the EMI population is minimally integrated into general education. It was found in this study that only 2.5% of the EMI population received more than 50% of their reading/English instruction in general education and thus met the requirement for inclusion in the MEAP test. This means that 97.5% of the EMI students at the fourth-grade level throughout Michigan would not take the MEAP test. Only three categories (speech and language impaired--90.3%, physically or otherwise health impaired--70%, and visually impaired--100%) out of seven had more than 50% of their population qualify for inclusion in the MEAP. Efforts need to be made to allow those special education students being excluded from the MEAP test an opportunity to be exposed to the MEAP and also provide educators with data on how they are functioning in comparison with their general education peers. If more students are going to be included in the MEAP, not only for participation but for data collection, efforts should be made to extend the lower range of the test to include those skill and competency areas that may be prerequisite to the present MEAP. At the present time, without this lower extension, to require certain handicapped students to take the MEAP would only serve to confirm the self-concept of failure.

2. Statewide efforts must continue to be made to provide integration opportunities for special education students, thus allowing them the opportunity to participate with their general education peers and also in the MEAP test.

One of the most significant findings in this study was that minimal integration of fourth-grade special education students is taking place in Michigan. Based on the results of this study, only 33.7% of the fourth-grade special education students in Michigan met the criteria to be included in the MEAP test. If special education students do not participate in the MEAP test at the fourth-grade level, they may not be exposed to the test until the seventh or tenth grade. This does not allow for an accurate assessment of these special education students' basic-skills attainment in comparison to their general education peers until midway or late into their educational program. The major purpose of the MEAP is to allow educators and policy makers to obtain information on the status and progress of Michigan's basic-skills education. If a large number of special education students do not take the test, what indication does the state have regarding those students' basic-skills attainment? The individualized educational planning committee report provides an individual analysis of the students' programming and progress, but it does not address how the special education student is obtaining basic skills in comparison with his/her general education peers. If special education students are to function in the mainstream once they graduate or complete their high school career, there must be continuous assessment of their basic-skills attainment at the earliest

possible stage of their education, and intervention strategies must be implemented to build upon the special education students' basic skills along with all other behavioral and social skills necessary for those students to be integrated into the general education program. With more intense well-planned and coordinated integration strategies developed between general and special education, students will be more successfully integrated into the general education program, thus allowing educators an opportunity to monitor the basic-skills attainment for more special education students also.

3. Statewide efforts should be made to expose special education students to the test-taking components of the general education program, including those of the MEAP.

A significant finding in this study was that MEAP proctors could accurately make a judgment about whether the mechanics of the MEAP test were appropriate or not appropriate for particular students taking the test. The proctors were instructed to observe students reading the directions, working alone, and marking answers on the answer sheet without skipping or double-marking. Almost 72% of the special education students participating in this study were judged not able to handle the mechanics of the MEAP test, and the significantly lower scores of those students judged unable to handle the test mechanics substantiated the proctors' judgment. It is interesting to note that approximately 30% of the fourth-grade special education students in the state of Michigan met the criteria for inclusion in the MEAP test, and the proctors judged approximately 30% of the special education students to be capable of handling the mechanics of the MEAP test.

Although not all of the students judged able to handle the test mechanics met the criteria for inclusion, a large percentage did. In this researcher's opinion, exposure to the general education classroom atmosphere and basic test taking provides students, both general and special education, the opportunity to become familiar with general education test taking (large groups, less individualization, on a more routine basis) and thus builds the self-confidence to be able to handle the mechanics of test taking. If special education students are more exposed to basic test-taking skills, similar to their general education peers, they can gain knowledge in an area that will help them be better prepared to participate in testing situations.

4. A study should be conducted on a statewide basis as to what efforts need to be made to increase the participation of special education students in the MEAP test at the fourth-grade level.

Of the fourth-grade special education students in Michigan, 69.3% do not meet the requirement to be included in the MEAP test. Statewide efforts must be made to identify the factors that cause this. Extensive analysis as to the correlation between the special education and general education curricula would be a start. If the state's ultimate goal is truly to integrate special education students into the general education mainstream, policy makers, teachers, and parents must analyze every aspect of the curriculum at the earliest stages of the student's education to infuse whatever strategies are necessary to make this happen. The individualized educational planning committee is a component already in place that could facilite an aspect of this analysis. It may be that a much larger percentage of

special education students have the cognitive, behavioral, and social skills necessary to be integrated into the general education program, but some factors are not allowing this to happen. It is very important for these factors to be identified, analyzed, and strategies implemented to alter them so special education students can more actively and successfully participate with their general education peers, thus maximally preparing them to be mainstreamed into society more equipped to be productive and contributing citizens.

For those special education students whose integration into the general education program is totally inappropriate, statewide program objectives should be established along with an assessment model so that the state can also see how the basic-skills and objective attainment is progressing for those students also. Therefore, the state will have fulfilled its responsibility of assuring that basic-skills education is taking place to the maximum extent possible for all students on a statewide basis.

5. State and local agencies should use the results gathered from special education students participating in the MEAP test to benefit in the instruction of handicapped students, thus providing them with the maximum opportunity to participate in the least restrictive environment. Teachers and administrators can use data gathered from the MEAP test summary reports, which provide individual-student-performance data along with total class, building, and school-district objective-attainment information. These data can provide insight into how special education students within each general education reading and/or math classroom are acquiring the basic skills

measured by the MEAP. Having access to this information, specifically for the handicapped, can provide feedback to general education teachers as to the value their curriculum and instructional strategies are having for these students. Alterations in curriculum management, instructional strategies, classroom techniques, or special education support for the handicapped students may be in order, based on their MEAP results.

The information gathered from this study as it relates to the number of special education students participating in the MEAP and the test results of the individual impairment categories also may provide valuable insight for educators. The fact that only 33% of the fourth-grade special education students meet the MEAP inclusion criteria indicates that special education students are not being integrated into the general education reading and/or math programs. A change of philosophy based on communication and curriculum continity between the general and special education programs should improve the integration and participation for all categories of special education students. For EI and LD students, it is evident that the higher the percentage of general education reading and/or math instruction they receive, the better their performance is on the MEAP. However, these two categories have the largest number of students at the borderline of being integrated into the general education reading and/or math programs. Because of the intense learning and emotional needs of these students and their MEAP scoring pattern, extensive communication has to take place between the general and special education staff to be sure the special education support

these borderline-integration students are receiving highly complements the curriculum being provided in the general education classroom. Both general and special education teachers have to understand each other's program operation so that support and continuity are of maximum benefit to the student. Once the communication and instructional strategies employed by both teachers are analyzed regarding their effect on the special education students' basic-skills attainment in the general education setting, more specific interventions will be developed that will enhance special education students' opportunities not only to participate and obtain the basic skills acquired in the general education program but also to achieve at a rate much more comparable with that of their general education peers.

In an effort to obtain a specific statewide report on the basic-skills attainment of special education students participating in the MEAP, the state may entertain the idea of mandating a separate MEAP report each year that indicates how all the special education students who qualify for inclusion in the MEAP under the present criteria are functioning on the MEAP test. These data could provide educators and policy makers specific information as to how the special education students are functioning on the MEAP as compared to their general education peers as a whole.

If such were done, concerns regarding the reduction of overall district MEAP scores by including handicapped students would be eliminated. It is recognized that some districts are affected by atypical numbers of handicapped students who are served in their

district programs. In addition, if there were reason for combining the data, such could be easily accomplished.

Recommendations for Further Research

1. A replication of this study should be conducted at the fourth-, seventh-, and tenth-grade levels to compare the percentage-of-instruction patterns in special and general education along with the MEAP scores of the seven categories of special education students. The results of this study may allow Michigan educators to assess special education students' involvement in and performance on the MEAP test and to pursue appropriate adjustments to allow the special education students' the maximum opportunity to participate in the MEAP test.

2. A study should be conducted to analyze the reasons why a majority of the fourth-grade special education population is distributed between the minimal (0-9%) and maximal (90-100%) math and/or reading instruction times in special education. The information gathered from this study should help identify factors that are responsible for the extreme gap in special education integration. If a majority of special education students are ever going to participate in the MEAP test, or are going to have experiences similar to those of their general education peers, this integration gap must be narrowed, especially at the earliest stages in the students' education.

3. A study should be conducted to analyze the number of MEAP objectives that are being taught to special education students before

the MEAP test-taking date. Such a study could be conducted in the fourth, seventh, and tenth grades. It is important to determine, for special education students receiving portions of their instruction in both general and special education, whether they are being exposed to the MEAP objectives on which they may be tested. Analyses of the special education curricula, in particular, will provide insight into the curriculum match with the MEAP objectives. If there is a significant finding that special education students are not being exposed to the objectives of the MEAP test before testing, efforts can be made to enhance the curricular exposure for special education students and thus improve their opportunity to perform to their maximum ability on the MEAP test. The two major areas that should be addressed in this study, which are very important in state assessment testing, are the curricular and instructional validity relating to the MEAP.

4. A study should be conducted to analyze the influences of students' sex, race, economic status, parents' educational level, and community type in relation to special education students' performance on the MEAP test. Such information may provide additional insight into factors that might be correlated with special education students' performance on the MEAP test. If there is a correlation between students' MEAP test performance and the variables listed, intervention or support strategies might be employed to assist special education students in their participation in and performance on the MEAP test.

5. A replication of this study should be conducted with special education students receiving various percentages of general and/or

special education instruction. This study would expand beyond the percentages of reading and/or math instruction and would include all subjects or a student's total day.

6. A longitudinal study should be conducted with the special education students participating in this study, both individually and by impairment category. Data that have been gathered on the special education students in this study could be gathered at the seventh- and tenth-grade levels once the students reach those points of MEAP testing. Information gathered from such a study would indicate whether special education students individually, categorically, or as a total grade level are improving in their MEAP performance. Additional analyses could be conducted on how the students' integration and special education eligibility have changed, along with their progress or lack of progress academically as it relates to the three- or six-year period from their initial MEAP test.

The recommendations stated for further research are by no means inclusive. However, since very little research has been conducted regarding handicapped students' involvement in the MEAP test, further research will build a strong foundation for more specific future studies to take place.

APPENDICES

APPENDIX A

EXPLANATION OF SELECTION PROCESS, LIST OF 97 DISTRICTS CHOSEN FOR STUDY, AND LETTER TO DISTRICT SUPERINTENDENTS ABOUT DISTRICT SELECTION

Selection of School Districts

The master list of Michigan school districts includes all schools that have fourth-grade special education students in their system, as verified by their 1981 fourth Friday count. Schools were designated on the list by county and school district numbers. The random sampling began with the fourth school district on the list being picked, based on the selection of the number four from a random-number table. After the fourth school district was chosen as the start of the sample selection, every sixth district was selected to allow for an appropriate number of categorical special education students represented to warrant a confidence interval of 97% with 3% error tolerated.

This sample was selected in a way that ensured that all state school district subgroups in the population would be represented in the sample in proportion to their numbers in the population itself.

1982-83 Grade Four Special Education Sample

02-010	Autrain-Onota Public Schools
03-060	Martin Public Schools
05-010	Alba Public Schools
06-010	Arenac Eastern School District
07-040	L'Anse Township School District
08-050	Thornapple Kellogg School District
09-050	Essexville Hampton School District
11-300	Niles Community School District
11-320	Watervliet School District
12-040	Quincy Community School District
03-030	Springfield City School District
14-010	Cassopolis Public Schools
15-050	Charlevoix Public Schools
17-010	Sault Ste Marie Area Schools
18-010	Clare Public Schools
19-010	DeWitt Public Schools
21-060	Rapid River Public Schools
22-030	Breitung Township School District
23-010	Bellevue Public Schools
23-490	Oneida Township School District #3
24-070	Public Schools of Petoskey
25-100	Fenton Public Schools
25-150	Clio Area School District
25-200	Lake Fenton Schools
27-070	Wakefield Township School District
29-050	Fulton Schools
29-100	St. Louis Public Schools
30-070	Reading Community Schools
31-020	Adams Township School District
31-130	Lake Linden Hubbell School District
32-090	Ownedale-Gagetown Area School District
32-540	Sheridan Township School District #5
33-020	Lansing Public School District
33-060	Haslett Public Schools
33-220	Webberville Public Schools
34-010	Ionia Public Schools
34-360	Ionia Township School District #2
36-015	Forest Park School District
38-090	East Jackson Public Schools
38-150	Springport Public Schools

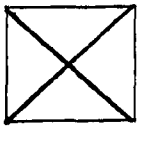
39-010	Kalamazoo City School District
39-130	Parchment School District
40-040	Kalkaska Public Schools
41-050	Caledonia Community Schools
41-090	East Grand Rapids Public Schools
41-160	Kentwood Public Schools
44-060	Imlay City Community School District
45-040	North Port Public School District
46-090	Madison School District
46-140	Tecumseh Public Schools
47-060	Harland Consolidated Schools
49-070	Moran Township School District
50-080	Chippewa Valley Schools
50-170	New Haven Community Schools
50-230	Warren Consolidated Schools
51-070	Manistee Area Public Schools
52-110	Republic Michigamme Schools
53-030	Freesoil Community School District
55-100	Menominee Area Public Schools
58-070	Ida Public School District
59-080	Tri County Area Schools
60-010	Atlanta Community Schools
61-020	Muskegon Heights City School District
61-060	Mona Shores School District
61-210	Ravenna Public Schools
61-240	Whitehall School District
62-080	Pineview School District
63-070	Avondale School District
63-140	Madison Heights School District
63-210	Holly Area School District
63-270	Clawson City School District
64-080	Shelby Public Schools
66-070	White Pine School District
68-030	Fairview School District
70-350	Zeeland Public School District
71-080	Rogers City Area Schools
73-190	Frankenmuth School District
73-230	Merrill Community School District
75-030	Centreville Public Schools
75-080	Three Rivers Public School District

76-060	Brown City Community School District
76-210	Sandusky Community School District
79-010	Akron Fairgrove Schools
79-145	Unionville Sebawaing Schools
80-120	Hartford Public School District
80-130	Lawrence Public School District
81-010	Ann Arbor Public Schools
81-100	Milan Area schools
82-010	Detroit Public Schools/Region 1
82-010	Detroit Public Schools/Region 7
82-030	Dearborn City School District
82-100	Plymouth Community Schools
82-120	River Rouge City Schools
82-220	North Dearborn Heights School District
82-320	City of Harper Woods Schools
82-430	Van Buren Public Schools
83-070	Mesick Consolidated Schools

97 Total Districts

Explanation of Strata

Community Type	Geographic Area: Region 1	Region 2	Regions 3 & 4
METROPOLITAN CORE AREAS & CITIES TYPES I & II	Stratum 1	Stratum 2	
TOWNS & URBAN FRINGE TYPES III & IV	Stratum 3	Stratum 4	
RURAL COMMUNITY TYPE V		Stratum 5	Stratum 6

 = No schools in this cell

Note: The Michigan map on the following page explains the various regions and types.

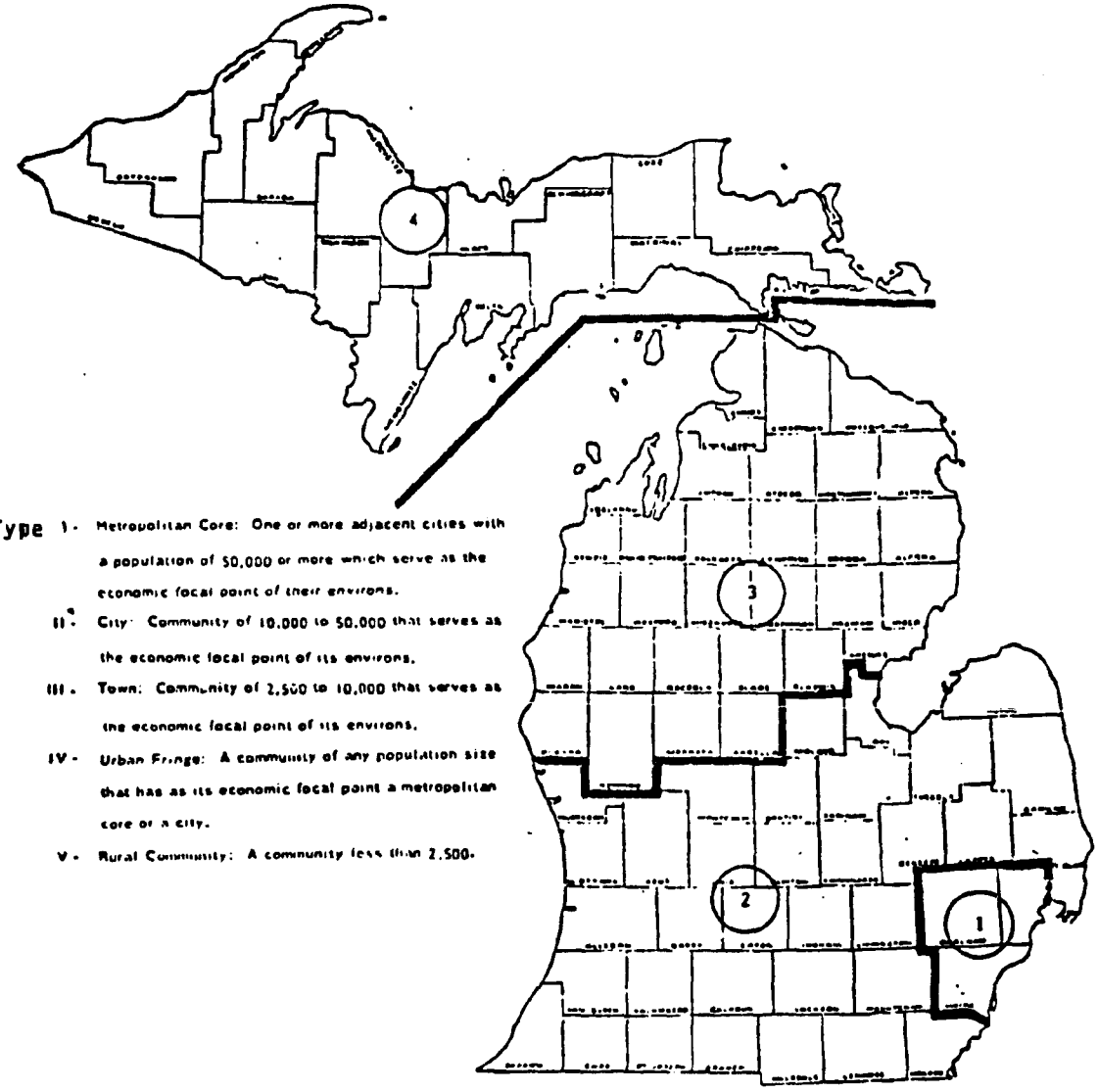
REGION AND COMMUNITY TYPE CATEGORIES

Region 1 - Wayne, Oakland and Macomb Counties.

2 - All counties in Southern Michigan that are south of and including Muskegon, Kent, Montcalm, Gratiot, Midland and Bay counties. This excludes Region 1.

3 - All counties that are north of the above mentioned line and that are in the Lower Peninsula.

4 - All counties that are in the Upper Peninsula.



Type I - Metropolitan Core: One or more adjacent cities with a population of 50,000 or more which serve as the economic focal point of their environs.

II - City: Community of 10,000 to 50,000 that serves as the economic focal point of its environs.

III - Town: Community of 2,500 to 10,000 that serves as the economic focal point of its environs.

IV - Urban Fringe: A community of any population size that has as its economic focal point a metropolitan core or a city.

V - Rural Community: A community less than 2,500.

STATE OF MICHIGAN

DEPARTMENT OF EDUCATION

Lansing, Michigan 48909

July 16, 1982

PHILLIP E. RUNKEL
Superintendent
of Public Instruction

Dear Superintendent:

In a letter dated June, 1982, you were informed of the plans for the 1982-83 Michigan Educational Assessment Program (MEAP). Included in these plans is a Special Education Study, involving special education students normally excluded from the MEAP tests. The purpose of this study is to determine which special education students should participate in future MEAP testing.

Approximately 400 schools, selected by district, will participate in the study. All of the schools containing fourth grade in your district are included in this study. In each school, all fourth grade special education students in certain categories will be tested, regardless of how much of their reading instruction is given in regular education (the current basis for deciding who participates in MEAP). After testing, someone familiar with the student will answer five brief questions on a special section of the answer sheet: 1) the student's primary special education category, 2) the amount of mathematics instruction received in special education, 3) the amount of reading instruction received in special education, 4) whether toinclude the student's results in the regular school and district summaries, and 5) whether the MEAP test was appropriate to the student.

Results will be used to determine whether the current criterion for inclusion of special education students in MEAP testing is valid. The results will be analyzed to determine if students who receive different levels of instruction in special education or who have different impairments show different levels of performance on the MEAP test will be compared to students' performance to see if teachers can judge which students should or should not take the MEAP test. Directions for the study will be given in the School Coordinator's Manual and the Grade 4 Assessment Administration Manual, and mention of the study is made in the District Coordinator's Manual. These manuals will be mailed to your District Assessment Coordinator in early August. Individual Student Reports and Parent Pamphlets will be prepared for all students. However, districts will use the current criteria for inclusion to determine which students to include in school and district summaries. Therefore, participating schools' MEAP summaries will be based on the performance of students that would have usually participated.

If you have any questions about this study or your participation in it, please contact an Assessment staff member at (517) 373-8393. Thank you for your continuing cooperation.

Sincerely,

David L. Donovan, Director
Research, Evaluation and
Assessment Services

cc: Assessment Coordinators
Edward D. Roeber, Supervisor
Michigan Educational
Assessment Program

DLD:ne

APPENDIX B

ASSESSMENT ADMINISTRATION MANUAL, GRADE 4

APPENDIX C

SCHOOL COORDINATOR'S MANUAL, FALL 1982

APPENDIX D

MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM

ANSWER SHEET, GRADE 4

APPENDIX E

TABLES

Table E-1.--Distribution of students in disability categories, by sampled Michigan school districts.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 1: Metropolitan Core Areas and Cities--Region 1									
1. Detroit Public Schools/ Regional									
2. Detroit Public Schools/ Region 7 (1 & 2 combined)	37		7			35			
3. Plymouth Community Schools	1	1	19	1		39			
								140	
Stratum 2: Metropolitan Core Areas and Cities--Region 2									
4. Niles Community School District			6			13			
5. Lansing Public Schools	15		40		2	46			
6. Kalamazoo City School District			4		1	18			
7. Muskegon Hts. City School Dist.	1								
8. Ann Arbor Public Schools		2	12	1	1	16	1		
								178	

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 3: Towns and Urban Fringe--Region 3									
9. Chippewa Valley Schools									No info. reported
10. New Haven Comm. Schools									No info. reported
11. Warren Consolidated Schools			8			49			
12. Avondale School District									No info. reported
13. Madison Hts. School District	1		1			8			
14. Holly Area School District	2		3			20			
15. Clawson City School District									No info. reported
16. Dearborn City School District	5	24		3		39	1		
17. River Rouge City Schools			2			2			
18. North Dearborn Heights School District						5			
19. City of Harper Woods Schools									No info. reported
20. Van Buren Public Schools	3		15	1	1	43			
								236	
Stratum 4: Towns and Urban Fringe--Region 2									
21. Essexville Hampton School District									No info. reported
22. Springfield City School District						2			

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 4--Continued									
23. DeWitt Public Schools									No info. reported
24. Oneida Township School District No. 3									No sp. ed. program
25. Fenton Area Public Schools						4			
26. Lake Fenton Schools						1			
27. St. Louis Public Schools	4		9			2	3		
28. Haslett Public Schools									No info. reported
29. Ionia Public Schools						1			
30. East Jackson Public Schools						7			
31. Parchment School District				1		3			
32. East Grand Rapids Public Schools						10			
33. Kentwood Public Schools	5					6			
34. Tecumseh Public Schools			2			3			
35. Mona Shores School District			1			3			
36. Whitehall School District	1		1			2			
37. Zeeland Public School District			1			1			
38. Frankenmuth School District						2			

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 4--Continued									
39. Three Rivers Public School District	1		1			14			
40. Hartford Public School District		2	1			6			
41. Milan Area Schools									No info. reported
								100	
Stratum 5: Rural Community--Region 2									
42. Martin Public Schools									No info. reported
43. Thornapple Kellogg School District	1			3		4			
44. Watervliet School District						1			
45. Quincy Community School District									No info. reported
46. Cassopolis Public Schools	1					4			
47. Bellevue Public Schools						2			
48. Clio Area School District						12			
49. Fulton Schools									No info. reported
50. Reading Community Schools									No info. reported
51. Owendale-Gagetown Area School District									No sp. ed. program

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 5--Continued									
52. Sheridan Township School District No. 5									No sp. ed. program
53. Webberville Public Schools		2				2			
54. Ionia Township School District No. 2									No sp. ed. program
55. Springport Public Schools						1			
56. Kalkaska Public Schools									No sp. ed. program
57. Caledonia Comm. Schools						5			
58. Imlay City Community School District									No sp. ed. program
59. Madison School District	1					1			
60. Hartland Consolidated Schools	1		1			5			
61. Ida Public School District						2	5		
62. Tri County Area Schools									No info. reported
63. Ravenna Public Schools						3			
64. Merrill Community School District			1			1			
65. Centreville Public Schools						3	1		

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 5--Continued									
66. Brown City Community School District	2					1			
67. Sandusky Community School District						3			
68. Akron Fairgrove Schools									No info. reported
69. Unionville Sebewaing Schools						3			
70. Lawrence Public School District						1			
								73	
Stratum 6: Rural Community--Regions 3 & 4									
71. Autrain-Onota Public Schools									No sp. ed. program
72. Alba Public Schools									No sp. ed. program
73. Arenal Eastern School District									No info. reported
74. L'Anse Township School District						1			
75. Charlevoix Public Schools									No info. reported
76. Sault Ste Marie Area Schools									No info. reported
77. Clare Public Schools			1			3			
78. Rapid River Public Schools						4			

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 6--Continued									
79. Breitung Township School District									No info. reported
80. Public Schools of Petoskey			2			6			
81. Wakefield Township School District									No sp. ed. students in 4th grade
82. Adams Township School District									No sp. ed. students in 4th grade
83. Lake Linden Hubbell School District									No sp. ed. program
84. Forest Park School District						1			
85. North Port Public School District									No sp. ed. program
86. Moran Township School District									No sp. ed. program
87. Manistee Area Public Schools						1			
88. Republic Michigamme Schools						1			
89. Freesoil Community School District									No sp. ed. program
90. Menominee Area Public Schools									No info. reported

Table E-1.--Continued.

District	Number of Special Education Students Participating							Total No. Participating Students	Total No. Nonparticipating Districts/ Students
	EMI	SLI	EI	POHI	VI	LD	HI		
Stratum 6--Continued									
91. Atlanta Community Schools									No sp. ed. program
92. Pineview School District									No sp. ed. program
93. Shelby Public Schools						2			
94. White Pine School District									No sp. ed. program
95. Fairview School District						2			
96. Rogers City Area Schools									No info. reported
97. Mesick Consolidated Schools									No info. reported
								24	
Column totals	82	31	138	10	4	475	11	751	40[a]

Key: EMI = Educable mentally impaired
SLI = Speech & language impaired
EI = Emotionally impaired
POHI = Physically or otherwise health impaired
VI = Visually impaired
LD = Learning disabled
HI = Hearing impaired

[a]Breakdown of 40 nonparticipating districts is as follows: 14 = no programs, 2 = no 4th-grade special education students, 24 = did not report information.

Table E-2.--Mean MEAP math and reading scores for special education students, by category.

Category	Mean MEAP Math Scores, by Percentage of Special Education Math Instruction															
	0-9%			10-29%			30-49%			50-69%			70-89%			90-100%		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Educable mentally impaired (EMI)	0			0			10	5.60	5.44	0			1	7.0	0	70	5.81	4.99
Speech & language impaired (SLI)	28	24.17	4.49	0			1	24.00	0	0			0			2	22.50	3.53
Emotionally impaired (EI)	35	16.88	7.73	9	18.77	8.34	5	16.00	6.40	6	12.00	4.89	3	17.33	5.85	80	13.02	8.10
Physically or otherwise health impaired (POHI)	5	19.00	5.83	0			0			0			0			5	13.00	10.31
Visually impaired (VI)	4	19.50	10.37	0			0			0			0			0		
Learning disabled (LD)	179	18.88	6.43	59	17.98	6.35	46	17.08	6.39	20	14.30	7.22	5	14.40	9.12	161	11.63	6.96
Hearing impaired (HI)	1	25.00	0	1	22.00	0	0			0			0			9	19.88	7.28
Totals	252			69			62			26			9			327		

Table E-2.--Continued.

Category	Mean MEAP Reading Scores, by Percentage of Special Education Math Instruction																	
	0-9%			10-29%			30-49%			50-69%			70-89%			90-100%		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Educable mentally impaired (EMI)	0			0			10	4.80	2.85	0			1	0	0	70	3.61	4.41
Speech & language impaired (SLI)	28	20.00	6.35	0			1	8.00	0	0			0			2	12.00	15.55
Emotionally impaired (EI)	35	12.65	6.68	9	14.22	9.33	5	13.80	9.62	6	7.0	9.62	3	9.66	5.50	80	8.42	7.98
Physically or otherwise health impaired (POHI)	5	15.20	3.27	0			0			0			0			5	6.00	7.17
Visually impaired (VI)	4	11.25	8.84	0			0			0			0			0		
Learning disabled (LD)	179	11.37	7.12	59	11.67	6.98	46	12.34	7.41	20	9.5	7.94	5	12.40	11.05	161	6.57	5.74
Hearing impaired (HI)	1	24.00	0	1	4.00	0	0			0			0			9	15.00	8.07
Totals	252			69			62			26			9			327		

Table E-2.--Continued.

Category	Mean MEAP Math Scores, by Percentage of Special Education Reading Instruction															
	0-9%			10-29%			30-49%			50-69%			70-89%			90-100%		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Educable mentally impaired (EMI)	1	19.00	0	0			1	16.00	0	8	3.12	1.72	0			71	5.77	4.82
Speech & language impaired (SLI)	28	24.17	4.49	0			0			1	24.00	0	0			2	22.50	3.53
Emotionally impaired (EI)	30	16.73	8.12	5	19.20	8.43	5	16.60	8.43	8	16.50	9.31	2	13.50	2.12	88	13.25	7.81
Physically or otherwise health impaired (POHI)	4	21.25	6.29	3	16.66	8.50	0			0			0			3	8.33	7.09
Visually impaired (VI)	3	24.66	1.15	1	4.00	0	0			0			0			0		
Learning disabled (LD)	71	18.57	6.73	54	18.51	6.00	40	18.87	6.21	45	13.73	7.65	16	15.62	7.78	245	14.26	7.46
Hearing impaired (HI)	2	22.00	4.24	0			0			0			0			9	20.22	7.31
Totals	139			63			46			62			18			418		

Table E-2.--Continued.

Category	Mean MEAP Reading Scores, by Percentage of Special Education Reading Instruction																	
	0-9%			10-29%			32-49%			50-69%			70-89%			90-100%		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Educable mentally impaired (EMI)	1	12.0	0	0			1	5.0	0	8	4.1	2.47	0			71	3.53	4.35
Speech & language impaired (SLI)	28	20.0	6.35	0			0			1	8.0	0	0			2	12.00	15.50
Emotionally impaired (EI)	30	13.5	6.37	5	17.0	9.19	5	11.4	7.26	8	12.7	8.84	2	6.00	1.41	88	8.20	7.74
Physically or otherwise health impaired (POHI)	4	14.7	2.87	3	12.3	8.14	0			0			0			3	3.33	5.77
Visually impaired (VI)	3	13.6	9.07	1	4.0	0	0			0			0			0		
Learning disabled (LD)	71	15.3	6.80	54	12.5	6.50	40	12.5	7.21	45	9.0	7.18	16	11.25	7.92	245	7.13	5.91
Hearing impaired (HI)	2	21.5	3.53	0			0			0			0			9	13.13	8.67
Totals	139			63			46			62			18			418		

Table E-3.--Mean MEAP math and reading scores for special education students, by category, judged able or unable to handle the mechanics of the MEAP test.

Category	Total			Mean MEAP Math Scores		Mean MEAP Reading Scores	
	N	Able	Unable	Able	Unable	Able	Unable
Educable mentally impaired (EMI)	82	1	81	19.0	5.8	12.0	3.7
Speech & language impaired (SLI)	31	25	6	24.9	20.3	20.8	11.6
Emotionally impaired (EI)	138	52	86	18.5	12.1	15.4	6.7
Physically or otherwise health impaired (POHI)	9	5	4	22.8	8.5	14.0	5.2
Visually impaired (VI)	4	3	1	24.6	4.0	13.6	4.0
Learning disabled (LD)	467	116	351	19.0	14.9	13.9	8.5
Hearing impaired (HI)	11	8	3	23.2	13.3	18.6	4.6
Totals	742	210	532				

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