DOCUMENT RESUME

ED 071 000 CG 007 738

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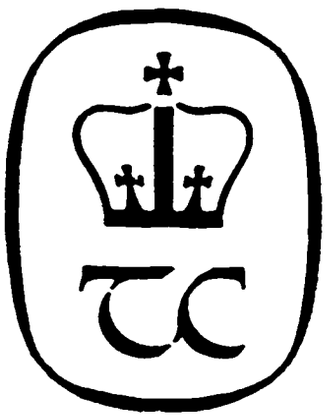
TITLE Educational and Career Exploration System: Report of a Two-Year Field Trial.
INSTITUTION Columbia Univ., New York, N.Y. Teachers College.
PUB DATE 72
NOTE 130p.

EDRS PRICE MF-$0.65 HC-$6.58
DESCRIPTORS Career Education; Career Planning; Computer Assisted Instruction; Decision Making Skills; *Educational Guidance; *Educational Innovation; Educational Research; Educational Technology; *Occupational Guidance; Occupational Information; Program Descriptions; *Secondary School Students; *Vocational Development
IDENTIFIERS ECES; Educational and Career Exploration System

ABSTRACT

This report traces the earliest field trials and later developments of the Educational and Career Exploration System (ECES), a computer-based learning environment to be used as a part of the educational and vocational guidance services in secondary schools. ECES includes a set of experiences in which the student considers his own educationally and vocationally relevant characteristics, a series of exercises dealing with the structure of the world of work, and extensive opportunities to learn about decision making by manipulating information about potential opportunities. The initial field trial of ECES in Montclair, New Jersey, in 1969 and preliminary work done with ECES in Genessee County, Michigan, are covered briefly. These provided guidelines for the more extensive field trail conducted in 1971-72 in Genesee County, Michigan. Using the Career Development Inventory (CDI) as a measure of vocational maturity, posttest findings included the following: (1) ECES users showed larger gains than non-users both in degree of planning orientation and in choice and use of resources for exploration; and (2) Users did not differ fron non-users in quality of decision making and amount of occupational career information possessed. (Author/SES)



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Report of a Two-Year Field Trial

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ACKNOWLEDGMENTS

The conduct of the field trial reported herein involved many people who have not been properly credited in this document. On behalf of the evaluation team, I would like to use this space to move a bit closer to propriety.

Many officers of the International Business Machine Corporation provided vision, moral support and money, without which this effort would never have begun. Notable among those are Frank J. Minor and Jack Kelly. We are much indebted to them.

Theodore W. Friel and his associates at Eastern Psychological, Educational and Community Services also contributed more than the casual reader might detect. Though Dr. Friel appears as one of the authors of this report (he wrote most of Chapter IV) his participation was much more central to the project than his position on the author list suggests. He has been the major consultant throughout the field trial and the design and implementation of the demonstration project was entirely his responsibility.

At Teachers College, a number of people have made contributions that might not otherwise have been recognized. The important collaboration of Martin J. Bohn, Jr., David J. Forrest and Jean Pierre Jordaan have been noted on the title page. Others who have played important roles are Thomas Blinn and Karl Heimer, our computer specialists; Sylvia Clack, the first ECES monitor; and Lou Papalexiou and Suzanne Troxell who managed the production of the reports.

At the Genesee Intermediate School District in Flint, Michigan, Marilyn Griffin, Billie White, and Richard Fulton played important roles. The diligent, accurate and essential work of Dianne Petiprin, Nancy Dorman, and David Dorman in collecting data and keeping the data flowing from Flint to New York

was central to the effort. The many counselors throughout Genesee County who, in most cases, coped with our unreasonable demands deserve much credit. And among these, the counselors at control schools - who enjoyed none of the fruits of the field trial - are doubly deserving.

Finally, the steady hand of A. E. Mallory, Jr., Director of Vocational and Technical Education at Genesee County, that guided the entire ECES field trial from beginning to end, is due a grateful shake.

Roger A. Myers

I. INTRODUCTION

The development of the Educational and Career Exploration System (ECES) began in 1966 at the Advanced Systems Development Division of the International Business Machines Corporation. The project was headed by Dr. Frank J. Minor, in consultation with Professors Donald E. Super and Roger A. Myers of Teachers College, Columbia University. The goal of the development was to provide a computer-based learning environment to be used as a part of the educational and vocational guidance services in secondary schools.

It was intended that a student using such a learning environment would benefit in a number of ways. Specifically, the system should:

1. broaden the student's knowledge of occupational alternatives and of his own multi-potentiality by an exploratory process so that he could understand how his tentative goals relate to his personal attributes;

2. provide the student who is interested in post-high school education with a means of exploring curriculum preferences exclusive of occupational goals, but with the ability of relating these preferences to occupational potential; and

3. provide the student with a means of narrowing the search for educational and training institutions which satisfy his career or curriculum preferences, his learning abilities, and his personal preferences (Minor, Myers, & Super, 1969).

To accomplish these goals, ECES was designed to include a set of experiences in which the student was caused to consider his own educationally and vocationally relevant characteristics, a series of exercises which helped the student to learn about the structure of the world of work, and extensive opportunities to learn about decision making by manipulating information about potential opportunities.

After the first model of ECES was completed, Dr. Theodore Friel joined the development effort and made extensive revisions and improvements. Dr. Friel has influenced the structure and use of ECES from that point until the present.

Throughout the developmental period which preceded this report, those involved in the construction and refinement of ECES have benefited from collaboration with other psychologists and educators pursuing similar goals. Through the annual Symposium for Systems Under Development for Vocational Guidance (See Campbell, 1966; Minor, 1967; Tiedeman, 1968), continual consultation and criticism has been shared with developers throughout the country. Most particularly, ECES growth has profited from the experiences and the interest of developers of other computer-based systems including Cogswell (Loughary, Friesen, & Hurst, 1966), Harris (1968, 1972), Impellitteri (1967), and Tiedeman (1968).

Rationale for ECES

During the past 20 years those most concerned with the study of occupational choice, career guidance, and the evaluation of guidance procedures have abandoned conventional concepts of vocational choice and with them the traditional criteria for the evaluation of methods. Instead, they have substituted the concept of career or vocational development for that of occupational choice, and the developmental criterion of vocational maturity for static criteria such as having an occupational choice, or having a realistic occupational choice. The history of these changes is too long to describe in detail in this report, but some of the major issues, the major studies involved, and the findings to date need to be identified here to make clear the basis for the evaluation procedures selected for the field trial described herein.

The trait-and-factor approach which dominated work in vocational guidance until 1951 recognized the emergence of vocationally relevant characteristics in early adolescence, and seemed to fit reasonably well the organization of school curricula requiring prevocational choices in the ninth grade. The

extensive and important work along these lines was discussed in detail by Super (1949, revised by Super and Crites, 1962). But in 1951 Super (Super, Crites, Hummel, Moser, Overstreet, & Warnath, 1957) returned to a line of inquiry which he had begun prior to World War II (Super, 1942). He was encouraged in this by the results of a sociological study in the United States (Davidson & Anderson, 1937), a psychological study in Austria (Buehler, 1933), and, after the War, by another American sociological study (Miller & Form, 1951), and an interdisciplinary American study (Ginzberg, Ginsburg, Axelrad, & Herma, 1951).

The developmental approach stressed by this last group of researchers resulted in a series of studies of career development (Super, 1953). The Career Pattern Study (Super, 1954, 1955; Super, et al., 1957; Super & Overstreet, 1960; Super, Kowalski, & Gotkin, 1967) demonstrated that the conventional objectives and criteria of vocational guidance were invalid and irrelevant in the ninth grade. This is because most ninth graders can and will, when asked to do so, report an "occupational choice"; because changes in educational and occupational plans are frequent during the high school years; and because consistency of choice or of field of choice is not related to other traits of known importance in ninth graders. Furthermore, even measures of realism or wisdom of occupational choice are unrelated to each other or to other personal traits in ninth grade, to similar traits later when in the twelfth grade, or to career success or satisfaction at age 25. Appropriate objectives and criteria for ninth graders were shown, by the Career Pattern Study, to involve planfulness and time perspective (the tendency to look ahead and plan for anticipated situation, having and seeking needed information, and knowing what kinds of information are likely to be needed). These have been characterized

as indices of vocational maturity, indices which show increases as adolescents go through high school and enter college and the world of work.

The criteria developed by the Career Pattern Study had been used in independent but replicating studies in California and in the Philippines, and particularly in a replication with variations in Massachusetts by Gribbons and Lohnes (1968, 1969), and as a part of an evaluation of educational and vocational guidance materials developed by Katz (1958) at the Educational Testing Service. Although differing in some important details of method and findings, Gribbons' and Lohnes' Career Development Study essentially confirmed in eighth, tenth, and twelfth grades the findings reported by the Career Pattern Study. In studying occupational plans and the outcomes of vocational guidance in several Wisconsin high schools, Rothney (1958) also confirmed the instability of early adolescent choices as did Flanagan and others in Project TALENT (Flanagan & Cooley, 1966; Cooley & Lohnes, 1968).

The above work has been synthesized by Myers and Jordaan (1970), Super (1969, 1970), Super and Bohn (1970), and Crites (1969). Evaluations of these projects and contributions have also been published by Osipow (1968).

The challenge of ECES development was to create a system which would influence the vocational maturity of its users. The system is therefore less concerned with occupational choice--and presumed efficiencies thereof--and more concerned with fostering the development of choice making, resource use, and self concept implementation.

The Montclair Field Trial

As the system developed within the confines of IBM's Advance Systems Development Division Laboratory in Yorktown Heights, New York, frequent trials with subjects of high school age were carried on (e.g. Pilato & Myers, in press).

With the development of what appeared to be adequate hardware, a procedure for storing information, a series of appropriate data bases, and a means by which individuals could engage in a meaningful exchange with the data base, the time came to address the basic questions of how ECES would work in the field. What effects would it have on its users, what reactions would it evoke from students, counselors, teachers, and parents?

In January of 1969, ECES was installed at the high school in Montclair, New Jersey for its first field trial. For one semester, the system was used by a sample of 160 students selected so as to represent all high school grades, males and females, black and white students, and college-bound as well as non-college-bound students. The findings which are briefly reported here are described in detail in Thompson, Lindeman, Clack and Bohn (1970).

1. Did the system function adequately? The findings demonstrated that the system could be installed and maintained in a community high school with relative ease. After the removal of the inevitable minor technical problems, the equipment required little special maintenance. It was also established that ECES could be used in ongoing high school guidance programs without interference with class work and other activities.

2. Was ECES appropriate for the target population? The trial also established that the system was applicable and appropriate for students within a wide range of ages, grades, intellectual levels and socio-economic backgrounds. Most of the students could use the system after a brief orientation, but the need for a clerical level monitor to assist the students was clear. There was robust evidence that the students not only could use the system but also did so with a good deal of enthusiasm. The data on the use of the system revealed that it was appropriate over the entire range of students in the trial. Ninth and tenth grade non-college-bound males used it most and black non-college-bound females used it least. Attendance records suggested a high degree of motivation among the users.

3. What effect did the use of the system have upon the vocational development of students? The data indicated that users gained significantly on a scale measuring how much specific knowledge a student thought he had concerning occupations. Other measures of vocational maturity were not affected, nor was realism of vocational and educational self concept. Changes were observed in a variety of students' attitudes toward sources of job satisfaction, as measured by the Work Values Inventory (1970).

4. What did the students think of ECES? In general, the study of student attitudes toward ECES revealed that the majority of students enjoyed working with the system, found the material easy to read and to understand, and felt that they made progress in thinking about their future as a result of each session with ECES. The non-college-bound students received more help than the college-bound in finding out about courses they might take in future education or training, about high school majors they should consider, and about information on colleges and vocations which they might like to consider. The non-college-bound also reported receiving more help in seeing the relationship between their interests and abilities and possible occupations. There was some suggestion that the black students had more difficulty in the beginning in using the system, but as they became more accustomed to the system the black students frequently reported getting more help than did the white students. Similarly, the male students experienced more difficulty than did the female students in understanding the operating manual but reported that they had received more educational information than the females did. In general, the earlier grade levels, ninth and tenth grades, were more consistent in the help they reported that they got during the sessions.

5. What did the parents think of ECES? Over half of the parents reported that there was considerable discussion with their children concerning ECES. About 60% reported that they had become more involved in their child's planning. Like their children, the parents considered ECES particularly useful in getting important facts about occupations and in seeing connections between personal characteristics and occupational possibilities. About three-fourths of the parents felt that their children were able to make better career decisions as a result of having used ECES. Most people felt that the system should be available in the seventh, eighth, ninth and tenth grades. Almost eight of ten parents believed that if ECES were available they would want their school district to get it as soon as possible. Almost 70% of the parents felt that there should be more emphasis on educational and vocational guidance in the schools than there is now.

6. What did the counselors think of ECES? In general, the counselors did not think that a 3-month trial of ECES had produced extensive changes in their own working patterns. They reported that the effect of the system was seen in increased activities in other aspects of the guidance program, particularly in the use of the occupational library. They stated that the most visible outcomes were seen in the occupational and educational plans of the students. Usually the effect of ECES was seen as promoting higher and more appropriate occupational plans and goals.

The Genesee County Field Trial

Armed with the information that ECES could work in a high school and could have useful effects on its users, the developers set about to conduct

a longer term field trial encompassing larger numbers of students and more schools. An agreement was reached between IBM and the Genesee Intermediate School District (GISD) to conduct an extensive trial of ECES as it was revised on the basis of the Montclair trial and modified to fit the local realities of Genesee County, Michigan. A team of psychologists from Teachers College, Columbia University was engaged to conduct the assessment of the field trial.

The ECES configuration used in Genesee County contained three sections: occupations, consisting of 400 occupations representing many fields and levels; majors, consisting of 300 post-high school, college and other training program majors; and charts, which summarize and compare information about the student and his explorations on the system. These three sections are available to the student in an interactive mode. The terminal which the student uses consists of a film image display unit, which presents relatively static information and questions, and a typewriter, which presents individualized information to a students. In addition, a post-high school program locater called College Finder is available for use without the terminal.

In Genesee County ECES was powered by an IBM model 360-40 computer located at GISD headquarters. The terminals in the field were connected by remote data link.

The plan for the first year of the field trial was to work through the technical difficulties connected with using ECES for large numbers of students, to construct and evaluate instruments for the assessment of ECES use, and to explore the ways in which ECES might best fit into existing guidance services.

The students participating in this first year of the field trial were tenth graders in twenty-five public high schools in Genesee County, a major

automobile manufacturing area with a population of 450,000 dominated by Flint with a population of 195,000. To be considered eligible for using ECES, a student had to have on file with the GISD a grade point average from the previous year, and complete scores for the Ohio Vocational Interest Survey and the Vocational Planning Inventory. Both instruments were used in producing a search strategy to help students use ECES. The Vocational Planning Inventory also provided a predicted high school grade point average as a measure of learning ability used in the system. Of the 9,448 tenth graders in the county in 1970-71, 5,587 or 59% met these criteria. All of the students were eligible to be included in the data collection.

The schools in the county were paired with regard to size, socio-economic level, location, ethnic composition, number of counselors, and drop-out rate. For each pair a coin was tossed to determine which would be experimental and which would be control. In the final analysis, the experimental schools had 3,201 sophomores in the study while the controls had 2,386.

Students at both the experimental and the control schools were given the Career Development Inventory (CDI) (1972) at the beginning of the school year and again at the end. In addition, all students who used the system were given a student reaction form. A sample of system users and their parents were sent questionnaires at the end of the school year.. All of the counselors at the experimental schools were interviewed by the evaluation team.

The terminals were located in a central place at GISD headquarters. The students were brought to the terminals by bus. The results from the first year of field trial in Genesee County are reported in detail in a preliminary report (Myers, Lindeman, Forrest, and Super, 1971) and are briefly summarized here.

1. How was ECES used? The way in which students used ECES is difficult to describe because of the variety of ways in which ECES was available to them. Most students used the system at the terminal location at GISD where they were taken by bus. After some students had begun using the system for 55 minute periods, the procedure was changed so that students were scheduled to use it for two two-period block sessions, with no opportunity for further use. In addition, two of the schools had their own terminals away from GISD and they worked out their own use patterns.

   Combining all of the students who used ECES during the first year of the trial, regardless of where and when they used it, it was found that less than 6% of them had an opportunity to use it for more than four hours. Forty-four percent used it for four hours, and more than half of them used it for less than four hours. The Montclair field trial demonstrated that when students were free to use the system as much as they wanted, they used it for a mean of 6.7 hours each. Clearly, the constraints of the GISD field trial prohibited this much exposure.

2. What did the students think of ECES? The most important observation to be made from the student reactions after using ECES is that the great majority of them indicated highly favorable reactions to all aspects of the system. The physical features of the system were seen as easy to use. The system was judged to explain ideas, occupations, and majors clearly. The charts were considered helpful. The system was seen as being helpful with educational and occupational planning. The overall reaction was overwhelmingly favorable.

3. Were there effects of using ECES on vocational maturity? When ECES users were compared on the CDI, a measure of vocational maturity, it was observed that ECES users tended to show slightly greater improvement than non-users in terms of the quality of potential occupational resources they knew about and the quality of occupational resources they actually used. The differences, while they were statistically significant, were small. Forty percent of a sample of students who were surveyed about their reactions to ECES indicated that they thought the use of ECES had resulted in a change of plans. Another 25% was not sure. Seventy-two percent of the students saw themselves as being either rather definite or very definite about their plans, and only 3% saw themselves as uncertain. Clearly, the vast majority of these students reported that they were more definite about their plans after having used ECES.

4. What did the counselors have to say about ECES? Considering counselors reactions to the effects of ECES on students, it was clear that most of the reactions were positive and supportive of the system's efficacy.

4.(Cont'd.) Although the students were seen as benefiting from ECES, the counselors were not totally uncritical when viewing some of the specific aspects of the system. Counselors views of ECES hardware, scripts, and the mechanics of the field trial were also generally positive. Most of the counselors agreed that ECES created more work for them though this fact may have been more a function of the evaluation procedure than of the system itself. A large number agreed that ECES had caused them to do reading that they would not have otherwise done, and about one-third of the counselors reported that they had been stimulated to do some independent local research on ECES users.

In general, counselors approved of ECES when they were asked to consider its effect on students and when they were asked to look at the specifics of the system. The presence of ECES and its evaluation have brought about some positive changes in the counselors job activities.

Though the findings reported above are of obvious interest, the main value of the first year of the field trial was the development and refinement of the research procedures and instruments. Principal among these was the CDI (1972), a valid and reliable measure of vocational maturity, which will be described in a later section.

II. THE ASSESSMENT PLAN

The Montclair field trial of the Educational and Career Exploration System (ECES) answered basic questions about the system's suitability for use with high school students and provided a basis for revision. The preliminary work in Genesee County resulted in a number of important guidelines for the conduct of the field trial in 1971-1972.

To begin with, it was clear that vocational maturity--i.e., planfulness, knowledge of resources for planning, and decision making skill--could be measured reliably by the Career Development Inventory (CDI). In addition, the experience had shown that because of the difficulties in coordinating the efforts of so many counselors in Genesee County, certain of the data collection methods that had been tried in 1970-1971 were clearly impractical. Finally, there was knowledge that users of ECES did not show demonstrable gains over non-users in vocational maturity. Because of the preliminary nature of the first year's effort, it was not easy to decide whether the lack of ECES effects was a trustworthy finding or an artifact of a variety of shortcomings known to exist in the early field trial. Therefore, the 1971-1972 plans for the use and assessment of ECES were altered in attempt to deal with these shortcomings.

The 1971-1972 Plan

1. Terminal location. Though a central location for the ECES terminals solved some administrative problems while the system was being installed and tried on a large scale for the first time, it created problems of other kinds. Inevitably, transporting students from their schools to a central terminal location involved difficulties in scheduling and a consequent reduction of the total time that some students had access to the system. Even more important, the counselors at the schools were more detached from the innovation than they

should have been because ECES was not visibly a part of their own guidance services. It was, instead, a county-wide service to which they were obliged to deliver the bodies.

For 1971-1972, the terminals were located in the schools. As before, the schools were paired according to size, socio-economic level, location, ethnic composition, size of counseling staff, and drop out rate. From each pair, one school was randomly designated experimental and the other control. Terminals were located at the experimental schools, thirteen in all.

2. Student use time. During the preliminary trial, certain advantages were realized by attempting to expose all tenth graders in experimental schools to the system. However the number of terminals available for the field trial made this possible only if each student had access to the system for a limited time. The result was that very few students (6%) had the opportunity to use ECES for more than four hours. In the revised plan, counselors were urged to get as many students as possible to use the system, but not to attempt to expose the entire tenth grade to it. Furthermore, each counselor was asked to make it possible for some students to use the system as much as they wanted.

3. Delayed effects. The developmental nature of vocational maturity naturally leads to the question of delayed effects. That is, the possibility was recognized that exposure to ECES had stimulated processes whose effects would not necessarily be observable immediately after that exposure. If the new experiences gained by the user were to lead him to be more planful, better informed about planning resources, and better able to make decisions, the increases might begin rather slowly and become manifest only after some time had passed. Logic suggests that delayed effects might be especially important as a user moves from his tenth-grade year to his eleventh-grade year, when considerations of the future begin to increase in urgency.

To assess the possibility of delayed effects, a sample of eleventh-grade students who had used ECES during the tenth grade was tested and compared to a sample of eleventh-grade students from control schools.

4. Counselor resources. During the first year of the field trial (1970-71), all counselors in experimental schools were given intensive training about ECES. The purposes, contents, logic and operation were all carefully reviewed. The strategies for its use were also covered, including suggestions for how a counselor might (a) prepare a student to get the most from using ECES and (b) help a student benefit from his explorations after using it. After these training sessions, relatively little was done by the project staff to guide the counselors as they incorporated this rather radical innovation into the o ing guidance services at their individual schools.

What resulted was considerable variation in counselor activity related to ECES. Some counselors conducted formal pre-ECES orientations for their students, but most did not. Some counselors conscientiously followed each ECES user to assure that the experience gained would be appropriately interpreted and acted upon, but most did not. Some counselors maintained an active interest in the progress of the field trial, but many did not. Observation of this variation in counselor activity led the project staff to the conclusion that a critical test of ECES effectiveness ought to include a trial of how ECES works when supported by a comprehensive program which guides the counselor's activities step by step. In order to accomplish this, the Decision Making Syllabus was created.

5. Decision Making Syllabus. The Decision Making Syllabus (DMS) was developed to provide counselors and students with a systematic skill acquisition

program for use in conjunction with ECES. DMS focuses on the acquisition of skills in four areas:

a. identifying career decision points

b. identifying sources and types of information

c. applying a systematic decision making model

d. developing a tentative career plan

It consists of detailed instructions for the counselor and the student covering three individual sessions, ten group sessions, and four visits to the ECES terminal. The units of the syllabus include such things as learning about occupational classification, orientation to ECES, reviewing ECES charts, evaluating one's progress, developing career plan strategies, and so on (Friel, 1972a).

From the counselors in experimental schools fourteen were chosen to conduct DMS groups of students at their schools. The counselors were chosen on the basis of their interest in and enthusiasm for the ECES field trial and their skills at interpersonal functioning. These counselors participated in a two-week intensive training experience during which the contents of the DMS were reviewed, revised and adapted to the realities of the individual schools represented by the counselors. The training experience also included training in interpersonal skills.

The counselors were each instructed to select for their DMS groups fifteen students who would show up regularly and do the work. They were also asked to pick students who had not already made all of their career decisions, who could read, and who were capable of participating in a group meeting.

The result of all of this was that a small group of counselors, chosen for their skills and enthusiasms, implemented the DMS with small groups of

students, chosen for their probability of completing and benefiting from the syllabus. The purpose was to demonstrate the usefulness of ECES used in conjunction with the DMS under the best of available conditions.

For the purpose of contrast, an approximately equal number of counselors in experimental schools were asked to identify fifteen students each who would experience ECES without DMS. A third group of counselors and students from control schools was also identified.

Summary

The assessment plan for the 1971-1972 ECES field trial consisted of the following:

1. A comparison of tenth graders who used ECES with a comparable group of tenth graders who did not, with regard to changes in vocational maturity.

2. An analysis of the relationship between change in vocational maturity and time spent using ECES.

3. A comparison of eleventh graders who had used ECES in the tenth grade with eleventh graders who had not, with regard to possible delayed effects upon vocational maturity.

4. A comparison of tenth graders who experienced the DMS with tenth graders who experienced ECES-ONLY and controls on vocational maturity. The DMS and ECES-ONLY groups were also compared on career planning skills, and a variety of education-and career-related behaviors. The parents of these two groups of students were also surveyed.

5. An assessment of counselors' reactions to the DMS and ECES-ONLY experiences.

III. RESULTS: VOCATIONAL MATURITY

This section presents the results of the 1971-72 field trial of Educational and Career Exploration System (ECES) conducted by the Office of Vocational and Technical Education of Genesee Intermediate School District (GISD) in 1971-1972. The results are presented in two parts. The effects of ECES on the vocational maturity of the tenth-grade users and the delayed effects on eleventh graders who used ECES in the tenth grade are included here. The assessment of the use of the Decision Making Syllabus (DMS) is covered in the next chapter.

Vocational Maturity of Tenth-Grade Users

Instrument. The basic assumption justified by the work of the Career Pattern Study (Super & Overstreet, 1960; Jordaan & Heyde, in process) and the Career Development Studies (Gribbons & Lohnes, 1968, 1969), is the adolescent years are for most boys and girls years of vocational exploration. The career development of most youths has not progressed to a point which makes definitive and lasting vocational choices possible. The decision process needs instead to be viewed as one of choosing, trying out, and evaluating the implications of a sequence of exploratory activities. Programs and services of educational and vocational guidance in junior and senior high school should then have as their main objectives the creating of awareness of the role of work in the lives of men and women; orientation to the world of work and of occupations; familiarity with the resources useful in exploration; the development of aptitudes, interests, values, self-knowledge, and self-understanding; knowledge of how to make career decisions; and practice in making them. The Career Development Inventory (CDI) does not attempt to assess the degree to

which all of these objectives have been attained in adolescence; to do so would require more time than is generally available for testing in the evaluation of projects.

The CDI used in this project assesses three of the important desired outcomes of career development and vocational guidance programs: 1) the development of a planning orientation towrad a career; 2) familiarity with and use of resources which can be useful in vocational exploration; and 3) knowledge of occupations and of career decision making principles. Its three scales do this reliably and with some evidence of validity.

Scale A, planning orientation, represents the degree of informed planfulness; it involves relating information about oneself and potential vocations, but it need not, however, result in firm plans. It includes measures of concern with choice, specificity of planning, and self-estimated amount of occupational information. It is a self-rating scale which reflects a planning approach to a career, an attitude in resulting knowledge and actions.

Scale B, resources for exploration, represents a self rated assessment of the used and available resources for use with these planning activities, resources from which a student learns about educational opportunities, occupations, and himself. It too reflects attitudes, attitudes of concern, inquiry, and trial. Specifically, Scale B is a measure of the quality of the actually used and the potentially usable resources for career (educational and vocational) exploration.

Scale C, information and decision making, unlike scales A and B, is a cognitive measure as shown by correlations with verbal intelligence and grade

point average. It assesses the student's possession of actual occupational information and his knowledge of how to integrate personal and occupational information into educational and vocational decisions. While Scale A represents the degree of the students awareness and of inclination toward planning and choice, Scale B thus assesses the quality or soundness of individually used and potentially available resources, and Scale C samples the amount of educational and occupational information the student has acquired together with his mastery of the use of information for sound decisions. Thus both attitudinal (self-rated and subjective) and cognitive (factual and objective) aspects of vocational development are tapped by the instrument.

Subjects. As was mentioned previously, the secondary schools of Genesee County, Michigan were paired on the basis of size, socio-economic level, location, ethnic composition, size of counseling staff, and drop out rate. By a flip of a coin, one school from each pair was designated as experimental and one as control. The schools and their designations are listed below.

Experimental	Control
Flint Northern	Flint Central
Flint Northwestern	Flint Southwestern
Ainsworth	Carmen
Swartz Creek	Davison
Beecher	Westwood Heights
Kearsley	Flushing
Grand Blanc	Clio
Lakeville	Mt. Morris
Fenton	Bentley

Atherton	Montrose
Bendle	Linden
Goodrich/Genesee	Lake Fenton

An ECES terminal was located at each of the experimental schools. Trained monitors, in most cases students from the schools, were provided. Counselors were instructed to assign students to ECES according to whatever use strategy the counselors preferred, except for the 14 counselors who were conducting DMS groups.

In total, 1886 tenth grade students used ECES during the school year. The amount of use time ranged from less than 1 hour to more than 17 hours. The mean use time at the various experimental schools ranged from 1 hour and 30 minutes to 4 hours and 50 minutes. The overall mean was 2 hours and 50 minutes.

Not all of the 1886 users are included in the analyses that follow, because data were not available for all of them.

At the beginning of the academic year counselors at all schools, experimental and control, were asked to administer the Career Development Inventory (CDI) to all tenth grade students. This administration, referred to as the CDI pretest, resulted in 10,489 students being tested. Near the end of the academic year, the counselors were again asked to administer the CDI. While all the counselors complied, they were not able to give the posttest to all the students who had taken the pretest. The CDI posttest yielded 2245 usable tests, 792 from experimental schools and 1453 from control schools. The possibility of some systematic bias having influenced the reduction of the population from 10,489 to 2245 cannot be assessed, but none is suspected.

In the analyses reported in Tables 1 through 12, users are those tenth grade students who actually used ECES and for whom usable CDI pretests and posttests

were available (N=792); controls are students from control schools for whom usable CDI pretests and posttests were available (N=1453).

Tenth-Grade Users vs. Controls

Results of analyses comparing tenth-grade users with controls on CDI scales A, B, and C are presented in Tables 1 through 6. Analysis of covariance (Winer, 1962)[1] was used for all such comparisons in order to provide an adjustment for possible initial differences on CDI pretest scores between the user and control groups. Thus, the analysis of posttest results on each scales was a two-way (Treatment Group by Sex) analysis of covariance with the corresponding CDI pretest scale serving as covariate.

Scale A, Planning Orientation. Reference to Table 1 shows that the adjusted means on CDI Scale A are somewhat larger for ECES users (104.4 for males and 105.9 for females) than for controls (102.6 for males and 103.2 for females). The results of the analysis of covariance in Table 2 indicate that this difference is significant at the .01 level (F=9.8). Furthermore, the differences between pretest and posttest means is larger for ECES users than for controls. These statistics indicate that the users had larger gains than controls in terms of planning orientation during the period of the study. Note, however, that the difference between users and controls was relatively small, about one-tenth of a standard deviation unit.

Scale B, Resources for Exploration. ECES users also showed significantly larger gains than controls in terms of choice and use of resources for occupational exploration. As seen in Table 3, adjusted means for users were 243.8 (males) and 254.1 (females), as compared with 240.0 (males) and 247.2 (females) for controls. Table 4 shows that the difference was significant at the .01 level. The average gain for users was about 13 points compared to about 6 points

[1] The computer program used was BMDx64, General Linear Hypotheses.

for controls. Again the difference between mean gains of users and controls is relatively small, amounting to slightly more than one-tenth of a standard deviation.

Scale C, Information and Decision-Making. As seen from Tables 5 and 6, differences in adjusted means between users and controls on Scale C were very small and were not statistically significant.

Summary of Tenth-Grade User vs. Control Differences. Compared with controls, ECES users showed significantly larger gains in both degree of planning orientation and in choice and use of resources for occupational exploration, but not in information and decision making. Assuming that all other environmental factors were essentially similar for ECES users and controls, one may conclude that the differences observed were due to the effect of the ECES program compared with the usual guidance program operating in the control schools. Thus, the use of ECES in conjunction with the regular guidance program may be judged to have a relatively small but clearly positive effect in promoting aspects of vocational maturity measured by CDI Scales A and B.

Tenth-Grade Males vs. Females.

While the major purpose of the analyses was to compare ECES users with Controls, it is also of interest to note differences in CDI performances between male and female students. Such differences may be observed by reference to Tables 1 through 6.

There were no significant differences between males and females on Scale A, but females did noticeably better than males on Scales B and C of the CDI. As shown in Table 3, adjusted means for females on Scale B were 254.1 (Users) and 240.0 (Control) for males, the difference being significant beyond the .01 level.

Table 5 shows that female users and controls both had an adjusted mean of 17.0, while males had means of 16.2 (Users) and 16.9 (Controls), significant at the .05 level. These results indicate that females in both user and control groups showed greater gains than males during the period of study both in resources for exploration and on information and decision-making.

It should be mentioned that in the analyses reported in Tables 1-6 there were no significant interactions between treatment group and sex. Thus, there is no evidence that the effectiveness of ECES is dependent on sex.

Relationship Between ECES Use Time and CDI Scores

Results of analyses in the earlier Montclair ECES field trial suggested that there should be a positive relationship between the students CDI scores and the amount of time he used ECES. In the first year of the GISD trial (1970-71) this hypothesis could not be tested because of the central location of terminals and the consequent limitation on optional usage of the system beyond the scheduled hours. In this second year, however, with terminals located in the experimental schools, students had access to the terminals on an optional basis and many took advantage of the opportunity to spend additional hours on the system.

ECES users were first divided into eight subgroups on the basis of hours of use time. The categories are indicated in Table 7. Analysis of covariance was used to compare CDI means of the eight subgroups on Scales A, B, and C. The results are presented in Tables 7 through 12.

Table 7 shows that the adjusted means on CDI Scale A tended to increase steadily with increased use time. For example, those who used ECES less than one hour had a mean of 98.1 while those students using the system for 6-7 hours had a mean of 118.1. Table 8 shows that differences among the means are

significant at the .01 level. The fact that there was a slight drop in the mean for those using the system more than seven hours (112.9) suggests that there may be an optimal maximum use time. However, the data are not sufficiently complete to permit the determination of such a value.

There were also significant differences between adjusted means of use time groups on Scale B, as shown in Tables 9 and 10. Again, there appears (Table 9) to be a steady increase in the adjusted mean as use time increases, with a slight drop occurring for those using ECES more than seven hours. The pattern is consistent with that on Scale A.

There were no significant differences in adjusted means on Scale C, as can be seen in Table 12. The adjusted means in Table 11 exhibit a trend similar to that for Scales A and B, but differences are very small.

These results indicate that, as might be expected, the longer a student uses ECES, the more he gains in terms of planning orientation and resources for occupational exploration. However, it should be pointed out that those students who were in the higher use-time categories generally had higher pretest means on Scales A and B than did those in the lower use-time categories. Therefore, one could argue that those in the higher use-time categories were more likely to gain more from using ECES because of stronger initial motivation. The results thus provide a strong argument for providing optional time on ECES to those who want it. They seem to get the most benefit from the system.

Delayed Effects on Eleventh-Grade Users

In a previous section two points were made that deserve repetition here. The first is that during the first year of field trial, tenth-grade ECES users did not show important changes in vocational maturity. It was difficult to know whether this finding was trustworthy or merely the consequence of a variety

of shortcomings known to exist in the beginning field trial. The second point is the recognition of the possibility that the use of ECES might have stimulated effects which were not immediately observable but which would appear at a later point in time. The analysis described below represents a search for such delayed effects.

Subjects. From the eleventh-grade students who had used ECES as tenth graders in 1970-1971 and who had usable CDI posttests, (taken at the end of their tenth grade) 200 cases from three experimental schools were selected. Another 200 cases, also with usable tenth grade CDI posttests, were selected from the matching control schools. The counselors in the six schools were provided with lists and asked to administer the CDI to these 400 eleventh graders near the end of the 1971-72 school year.

This data collection resulted in 124 usable CDI's for eleventh graders, 53 who had used ECES and 71 controls. Once again the reasons for the shrinkage from 400 to 124 are not known, but no systematic basis is suspected.

Analysis. Analysis of the eleventh-grade CDI data again employed a two-way analysis of covariance with treatment and sex as independent variables. The covariate was the CDI posttest which the current eleventh-grade students took at the end of their sophomore year. The results of these analyses are presented in Tables 13 through 18.

Tables 13 and 14 show that there were no significant differences among sub-groups in adjusted means on CDI Scale A. Means for females are slightly larger than for males, a finding observed among the tenth-grade students. Although the difference is about one-third of a standard deviation, it is not significant due to the much smaller number of eleventh-grade subjects on whom data were available for analysis.

Differences between males and females reach significance on Scales B and C, as seen in Tables 15 through 18. Eleventh-grade females are seen in Table 15 to have adjusted means of 278.2 (Users) and 263.8 (Control), compared with 245.2 (Users) and 250.3 (Control) for males. The difference is significant at the .01 level. This finding indicates that during the eleventh-grade year females improved more than males in terms of choice and use of resources for occupational exploration. Tables 17 and 18 show the same trend in means on Scale C, but the difference is smaller. One may conclude that females also improved more than males in terms of decision making skills and in occupational information.

The only significant difference between groups involving the treatment (User vs. Control) appears in Tables 17 and 18 on Scale C and consists of a significant interaction ($P < .05$) between treatment and sex. The reason for this result can be seen by examining the adjusted means in Table 17. Note that for males the difference between Users (19.3) and Controls (17.0) is about twice as large as for females (19.4 for Users and 20.6 for Controls) and is in the opposite direction. This is the only finding in either tenth or eleventh grades which suggests a differential effect of ECES involving sex. While the finding should be noted with interest, it is of doubtful theoretical or practical significance. The weight of evidence suggests that ECES is about equally effective for males and females.

In summary, the above results fail to reveal possible delayed effects on vocational maturity about which there was some speculation following the first year of the Genesee County field trial. Considering all of the evidence now available, it seems most reasonable to conclude that the failure to find positive ECES effects during the first year was due to insufficient exposure to the

system, rather than to the presence of real effects which were not immediately observable.

IV. RESULTS: AN ASSESSMENT OF THE DEMONSTRATION PROJECT USING THE DECISION MAKING SYLLABUS

Demonstration Project[2]

In retrospect, it has become obvious that the developmental history of ECES (Friel, 1972a) re-emphasizes the principle that people do best what they are systematically trained to do (Carkhuff, 1971a; 1971b). Specifically, the developments of the first version of ECES at Montclair, New Jersey demonstrated that students who were systematically exposed to career facts and career concepts exhibited an increased amount of such facts and concepts, but did not exhibit a greater amount of career decision-making skills (Thompson, et al. 1970). The reason for this was that ECES was not designed to provide skills training experience for the student, even though its developers hoped that skills generalization would occur from exposure to factual and conceptual experiences. The 1970-71 trial of ECES at Genesee County, Michigan, again failed to develop career decision-making skills, but did deliver precisely what it was designed to deliver - an awareness of the principle that decision-making skills represent an essential ingredient in effective career development.

ECES demonstrated that career insights and attitudes, while complementary to skills acquisition, do not, alone, systematically and predictably translate to behavior change in the areas of career decision-making skills. Again, the developers were persuaded that if you want to effect career decision making behavior, you must systematically train career decision-making skills (Friel, Drake, Tyler, & Mallory, 1972).

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2. This part of the field trial was designed, implemented and reported by T.W. Friel of Eastern Psychological, Educational and Community Services, Amherst, Massachusetts.

Consequently, the Counselors and Students Guide to Career Decision Making Skills (DMS) (Friel, 1972a) was developed to:

1. provide counselors with a systematic program to facilitate and direct his efforts to develop career decision-making skills in students;
2. provide the counselor with a systematic program to maximize the students' exploration and utilization of ECES within the context of his career decision-making skills acquisition; and
3. provide the student with a systematic program that increased the quantity of career decision-making skills he needs to make more systematic and logical career decisions.

The DMS Guides were designed to be used by those counselors who had received systematic Human Resource Development (HRD) skills training (Carkhuff, 1969; 1972a; 1972b; 1972c; Carkhuff, Friel & Berenson, 1972; Carkhuff, et al., 1972), and ECES utilization training.

The HRD trained counselors, the DMS Guides, and the ECES terminal all comprise the present developmental phase ECES, called DMS (Friel, 1972).

The hypothesis being tested in DMS is that systematically trained counselors, using a systematic program designed to develop specific career decision-making skills, can develop in students a greater quantity of these skills than comparable students can obtain through less systematic alternatives.

The primary research design focused on three groups of tenth grade students:

Group 1 - DMS Group (N=105)

Used DMS Guide

10 classroom sessions

3 personal counselor visits

4 ECES visits (approximately 4 hours)

Group 2 - ECES-ONLY Group (N=87)

Used ECES (approximately 4 hours)

Saw counselor on regular basis

Group 3 - Control Group (N=65)

Did not use ECES

Saw counselor on regular basis

These groups were pre-and posttested using the Career Decision Making Skills test (Friel, 1972b, see Appendix) which was developed to assess:

1. Specific career decision-making skills including:
   a. the quantity of occupational activities
   b. the quality of occupational activities
   c. the quantity of specific occupational decision-making information
   d. the quantity of unique career information sources
   e. the quantity of general career information facts identified with career information sources
   f. the quantity and quality of occupational alternatives expanding skills
   g. the quantity of occupational decision making skills
2. Student self-report data on the impact of the training on the following aspects of his career planning:
   a. 14 specific career decisions
   b. the importance of career planning
   c. parental participation in career planning
   d. counselor utilization in career planning

Also tested were the following groups of students:

1. a randomly selected sample of students from each of grades seven through fourteen.

These groups were pretested to examine the relationship between career decision-making skills acquisition and normal educational development.

2. four groups of 11th grade students who had participated in the ECES field test in 1970-71:

Group 1 - was exposed to HRD trained and ECES trained counselors, and used ECES.

Group 2 - was exposed to ECES trained counselors and used ECES

Group 3 - was exposed to HRD trained counselors but had not used ECES.

Group 4 - was a control group exposed to traditionally trained counselors but did not use ECES.

These groups were tested to examine any impact that their previous experiences may have had on their current level of career decision-making skills.

3. A sample (N=20) of the Vocational Education and Career Development Service (VECDS) staff members from the Michigan Department of Education.

This group was tested to provide an index of how professional adults would score when asked to answer the CDMS test with specific reference to their present position, or the position for which they were preparing to enter.

Data Analysis for the Demonstration Project. The data will be presented in the order of the CDMS test questions. Those items that are most directly related to career decision-making skills will be highlighted. The others will be mentioned if the data reveal any relevant information, either positive or negative.

1. CDMS - Item 2 - Number of occupational activities listed

Figure 1 shows the average number of activities listed for the grades 7 to 14 base line control groups, the 1970-71 groups, and the three 1971-72 experimental groups, DMS, ECES-ONLY, and the control group.[3] The base line control scores suggest that 7-10 grades list fewer activities than 11-14 grades. The 1970-71 group's scores suggest that ECES users list more activities than 11-14 grade base line controls.

The experimental scores indicate that the systematically trained students made a significant gain ($t=3.44, < .01$) in the number of activities listed, and listed significantly more ($t=3.04, < .01$) than the ECES-ONLY group, which gained, but not significantly. After training, the 10th grade DMS students listed more activities than the 11-14 grade base line controls.

2. CDMS - Item 2 - The quality of occupational activities listed

Figure 2 represents the quality of the average occupational activity listed in Item 2 of the CDMS. The quality was rated on a sacle from 1 to 5 where:

1. an occupational activity that is true of all occupations and in no way helps discriminate this occupation from any other, i.e. get to work on time
2. an occupational activity that is true of this general type of occupation (similar work environment and duties) but does not discriminate within the work group, only between work groups, i.e. work with large machines outdoors
3. an occupational activity that is generally true of a specific occupation, and helps to distinguish this occupation from others within its work group, i.e. take dictation and shorthand

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3. The means were calculated only from those students who responded to the items, hence the variation across items in the number of subjects per item.

4. an occupational activity that is specifically true of a specific occupation, helps to distinguish this occupation from others within its work group, and makes reference to the function of the activity within the occupation, i.e. use an IBM MTST to type letters and materials that will be changed frequently before final typing.

5. an occupational activity that is specifically true of a specific occupation, helps to distinguish this occupation from others within its work group; makes reference to the function of the activity; and relates the purpose of the activity to a human benefit for other people involved in the activity, i.e. train students in the career decision-making skills they need to make more logical and systematic career decisions throughout their career planning.

The base line control scores suggest that 13 and 14 graders test higher quality activities, as rated, than do 7-12 graders.

The 1970-71 groups' scores suggest the ECES users list equal or slightly higher quality activities, as rated, than do non-users.

The experimental group scores suggest that the systematically trained students gained significantly ($t=5.2, <.01$) in the quality of activities listed, and listed significantly greater ($t=5.2, <.01$) quality of activities than did the ECES-ONLY or control groups. The DMS students also listed higher quality activities than did any other student group.

3. CDMS - Item 8 - The quantity of specific kinds of occupational information necessary for decision making

Figure 3 shows the quantity of occupational information that students listed as being important to know before deciding about a job.

4. CDMS Item 9a - The number of unique career information sources listed

Figure 4 shows the number of unique career information sources listed by all student groups.

The base line control scores suggest that higher grade students (12-14) list slightly more unique career information sources than do lower grade students (7-11).

The 1970-71 group's scores that ECES users and non-users list approximately the same number.

The experimental group scores indicate that systematically trained students gained significantly ($t=4.5, <.01$) in their ability to list unique career information sources, and also listed significantly more sources than the ECES-ONLY and control groups.

The DMS students listed a greater quantity of unique career information sources than did any other student groups.

5. CDMS Item 9b - The quantity of career information items that students ask of all of their career information sources

Figure 5 shows the quantity of career information items that students ask of their career information sources to help them answer any questions or solve any problems they might have.

The base line control scores suggest that 12-14 graders score higher than 7-11 graders.

The 1970-71 group's scores suggest that ECES users score similarly to non-users.

The experimental group data suggests that systematically trained students gained significantly ($t=3.33, <.01$) in their ability to list a

greater quantity of career information items and also can list significantly more items than the ECES-ONLY and control students. The DMS students listed a significantly greater quantity of items than any other student group..

6. CDMS Item 10 - The quality of occupational classification and quantity of occupational alternative scores

Figure 6 shows the student scores for CDMS Item 10. The scores are comprised of a 5-step question that asks the student to classify given occupations into a dichotomous classification scheme, and then to add an alternative occupation to each of his classification cells. All classification schemes were accepted, with schemes utilizing both external (i.e. personal interests) criteria receiving scores twice that of schemes using only external, or only internal criteria.

The base line control scores suggest that 12-14 grade students score higher than 7-11 grade students.

The 1970-71 group scores suggest that ECES users score higher than non-users.

The experimental group scores indicate that the DMS students gained significantly ($t=1.95, <.05$) in their ability to classify and expand occupational alternatives, and also scored significantly higher ($t=1.95, <.05$) than the ECES-ONLY and control groups.

7. CDMS Item 11 - The quantity of occupational decision making skills

Figure 7 shows CDMS item 11, which evaluates the quantity of the students' occupational decision-making skills, giving one point for each decision making step the student takes in making his decisions.

The base line control scores suggest that 12-14 graders score higher than 7-11 graders.

The 1970-71 group's scores suggest that ECES and non-users score at the same level.

The experimental group scores indicate that the systematically trained students gained significantly ($t=2.38, <.01$) in their quantity of occupational decision-making skills, and also scored significantly higher than the ECES-ONLY and control groups.

The DMS students scored higher than all other student groups.

8. CDMS Item 12 - the extent the student reports that he is prepared to make his career planning decisions

Table 19 contains the means and standard deviations of DMS, ECES-ONLY and control students, for this item. While the data may well lend themselves to detailed statistical analysis, the major finding from this entire item is reflected to greater or lesser relief by each of the fourteen items, and further supported by additional counselor data on this same item.

Figure 8 displays the means and standard deviations for the first item, which exemplifies the major point for all of the rest. Pre-and posttested control students rate themselves at 3.5 and 3.9 respectively in terms of how well prepared they are to make their career planning decisions. On a pretest, ECES-ONLY and DMS students rate themselves at the same level (3.5 and 3.5).

However, on the posttest, the ECES-ONLY students were asked to re-rate themselves in terms of how prepared they really were before using ECES, now that they had used ECES and knew more about what was involved

in career planning. The ECES-ONLY students rated themselves at 3.3 pretest, and 4.1 as a result of using ECES.

The DMS students were asked for three post-ratings. First, a re-rating of where they were before they started (3.0). Second, a rating of where they would be if they only used ECES (3.6). Finally, a rating of where they were as a result of the DMS training (4.4).

The data suggest that unsophisticated students (controls) feel they are fairly well prepared in making their career plans. Given an exposure to career facts, concepts and principles, (ECES-ONLY) students realize that they were not as well prepared originally as they thought, but that they are significantly ($t=4.5, <.01$) better prepared as a result of their exposure.

The more sophisticated systematically trained students, DMS,give themselves the same initial rating, 3.0. However, the DMS students place the ECES experience into a more discriminating perspective by suggesting that while they gained significantly from that experience ($t=3.7, <.01$), the skills training itself provided an additional and significant ($t=6.4, <.01$) contribution to their preparedness for career planning decisions.

The implication is that self-report data is only as valid as is the level of functioning of the person who is self-reporting. This finding is consistently supported by similar research in the area of interpersonal skills, and human resource development skills training (Carkhuff, 1969; 1971a).

Counselor evaluations of student preparedness on these same items supports the DMS students' discrimination.

The data in Table 20 represent counselor observations of 540 students who had used ECES. The data were collected from nine counselors from the ECES-ONLY and the 1970-71 groups' counselors.

Clearly, the counselors felt the students gained significantly from their use of ECES. More importantly, they tended to rate the control students as low or lower than the students rated themselves, which supports the principle that discriminations are accurate to the extent that the rater is functioning effectively in the area being rated.

The counselors ratings are quite similar to the ECES-ONLY students' post-ECES ratings, and to the DMS student post-ECES ratings. This suggests that all three groups see the ECES experience as similar and consistent benefits to the students. However, the fact that the DMS students rate their experience at a significantly higher level suggests that their skills training is developing additional and significant benefits.

9. CDMS Item 13 - Time spent talking to parents

The data in Table 21 suggest that following use of ECES, and slightly more so following the DMS training, that students reported a slight increase in time spent talking with their parents.

10. CDMS Item 14 - Importance of career planning

The data in Table 22 suggest that following the use of ECES, and significantly ($t=5.55$, $<.01$) more so following the DMS training, students report an increased importance in the need to plan and prepare for a future career.

11. CDMS Item 17 - Counselor and parent utilization

After use of ECES, and significantly ($t=4.5 <.01$) more so after DMS training, students reported that they will be able to make better use of talks with their counselors and parents about career planning decisions. The data are reported in Table 23.

Summary and Discussion. The conditions under which the systematic DMS training occurred were not ideal. The counselors received their DMS guides with less than 14 weeks remaining in the Spring semester. Because of ECES scheduling pressures and graduation pressures on the posttesting of students, many counselors in the DMS group failed to complete the entire syllabus. On the average, 60% of the material was completed. It is to the credit of the extensive personal efforts of the counselors, administrators and GISD personnel that this demonstration project was successfully brought to completion.

Base Line Control Group. The data suggest a general, developmental trend of increased career decision-making skills acquisition occurring between the 7th and 14th grades. While the trend was never perfectly linear for all items, in general, higher grade students (12-14) scored higher than lower grade students (7-10), with the 11th grade students (small sample size) fluctuating between the two groups. This suggests that 7-10 graders may not have reached the point of needing to address career decision making as seriously as 12-14th graders, and that 11th graders are at the crisis stage where they are beginning to realize the increased need for such skills.

The VECDS staff scores tend to support the developmental trend hypothesis.

The 1970-71 Groups. In general, the data suggest that ECES users score slightly higher than do non-users on the CDMS Items. It is important to emphasize that the ECES students were not systematically trained in any of the CDMS skills. Consequently, any gains they make are a function of their exposure to the ECES program itself.

In general, the ECES users scored at or above the level of the eleventh-grade and base-line controls, and in the direction of the levels of the higher grade students. Similarly, the tenth grade ECES-ONLY students showed consistent

movement upwards towards the levels of the higher grade students. The data suggest that the tenth-grade students' three-hour experience on ECES prepares them, although unsystematically, to score above the level of their inexperienced peers and at or above the level of higher grades (12-13-14) students. However, in comparison to the experimental groups, the 1970-71 groups suggest that only slightly positive effects can be expected in career decision-making skills if they are not systematically trained. Again, ECES students were not systematically trained in the CDMS skills. Consequently, we should not expect systematic behavior change, only attitude and insight change. The 1970-71 counselors were trained to make a difference and they achieved that goal (Carkhuff, 1972c). This supports the principle that people learn best what they are trained to learn.

Experimental Groups. The DMS students scored slightly higher on its pretest scores than did the ECES-ONLY and control students. This may be explained by the fact that the counselors informed the students about the program's purposes and goals before pretesting. This may have provided the students with greater motivation to perform well on the pretest. However, their higher pretest scores simply make any posttest gains that much more meaningful due to the higher base rate from which the students began the training.

Table 24 demonstrates the order of group scoring on the pre- (23 comparable items) and posttests (29 comparable items), and also demonstrates the number of items that each group improved on from the pre- to posttesting.

Clearly, the DMS demonstrated the greatest number of positive gains, with the ECES-ONLY groups second.

The DMS students gained significantly in both career decision making skills and career planning attitudes and planning 'nsights. Where previous ECES efforts focused on attitudes and insights, they developed attitude and insight changes but not behavior changes in the form of improved career decision-making skills.

The DMS model focused primarily on career decision-making skills and developed increased levels of skills in addition to the complementary attitude and insight changes. This suggests that to improve the student's full range of career attitudes, insights and skills, it is necessary to focus on career skills as the insights and attitudes will necessarily follow. Conversely, programs that do not focus on career skills will fail to deliver fully the desired results.

Simply, the data indicate that tenth-grade students can be systematically trained to score at and above the level of untrained junior college students in the areas of career decision-making skills.

The key ingredients in delivering the DMS model were:

1. Counselors systematically trained to function at relatively high levels of HRD skills (DMS Counselors - 2.4; ECES-ONLY Counselors - 1.8; Control Counselors - 1.6) so as to improve their ability to relate appropriately and effectively with students.

2. Systematic programs that were designed under HRD principles to develop specific skills-based outcome objectives to students:

    a. ECES
    b. DMS guides

This finding supports the HRD principle that effective development of human resources requires the functional organization of HRD skilled people and systematic programs designed to deliver skills-based outcome objectives to those lacking such skills (Carkhuff, 1971a; 1972c).

The major conclusion bears repeating: people (i.e. students) do best (i.e. career decision-making skills) at what they are systematically trained to do. Students trained in facts and concepts can only be expected to improve

their facts and concepts. Generalization from attitudes and insights to skills did not occur in any of the ECES projects, regardless of the hopefulness of the researchers. Similarly, counselors did not deliver their objectives effectively until they were provided with the skills and the programs they needed to do so.

The implications for tomorrow's emerging issues of career education, counselor accountability, and performance objective attainment are clear. Counselors can be held accountable, for they can be evaluated and trained in the HRD skills needed to deliver effectively to students (Carkhuff, 1972c). Performance objective attainment is operationalized through the effective implementation of systematic, skills-based programs delivered by HRD skilled people (Carkhuff, Friel & Berenson, 1972).

The implications for career education are also clear. By operationalizing career education objectives into concrete and observable skills, it is now possible to develop such career development skills in students (Friel, et al. 1972).

The DMS model offers a strong first step in the direction of delivering functional, career development skills to students, as well as demonstrating the principles upon which effective student resource development models can be based.

4
Other Analyses

Vocational Maturity. For a large number of the students involved in the demonstration project, Career Development Inventory (CDI) scores were available on a pre-post basis. The so-called Intensive Study Group (ISG), as described on pages 24-30, made up of students in the demonstration project who had taken the

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4. At this point, the report of the Teachers College evaluation team resumes.

CDI, included 59 students who had received the DMS treatment, 67 who had received ECES ONLY, and 60 who were designated as controls and received only the guidance services normally provided by their schools. An analysis of covariance of the CDI data was used to determine whether statistically significant differences in vocational maturity between these groups had occurred during the period of study.

The results of these analyses are presented in Tables 25 through 30. Reference to Tables 25 and 26 shows that on CDI Scale A the DMS group had a significantly larger adjusted mean than did either the ECES-ONLY or control groups. DMS group means were 113.5 (males) and 117.3 (females), compared with 101.4 (males) and 108.5 (females) for ECES only and 106.7 (males) and 102.9 (females) for controls. The difference was equal to about one-half a standard deviation and was significant at the .01 level, as indicated in Table 26.

Tables 27 and 28 show similar findings for Scale B, i.e., the DMS group again had significantly larger adjusted means than did either the ECES-ONLY or control groups. DMS group adjusted means were 273.5 (males) and 279.4 (females) compared with 236.5 (males) and 250.4 (females) for the ECES-ONLY group and 239.2 (males) and 254.0 (females) for controls. This difference is equivalent to about three-fourths of a standard deviation and is significant at the .01 level. There was also a significant sex difference on Scale B with females having larger adjusted means. This finding is consistent with results presented in an earlier section of this report.

Results of the analysis of Scale C are shown in Tables 29 and 30. There were no significant differences in adjusted means on Scale C either between

treatment groups or between male and female students.

These results clearly indicate that the DMS treatment produced greater gains in the attitudinal dimensions of vocational maturity (Scale A and B) in both males and females. However, it should be emphasized strongly that students involved in the Intensive Study Groups were not randomly assigned to the treatment they received. On the contrary, students were assigned to the DMS group because they were judged by their counselors to be more interested than other students in engaging in the experimental programs and because it was thought they would profit most from it. Furthermore, the counselors by whom these students were chosen were themselves selected because they were thought to be more interested in the project and more skilled in counseling techniques than their fellow counselors. Thus. these results show that for a carefully selected group of both students and counselors the DMS treatment was more effective in promoting certain attitudinal aspects of vocational maturity than were ECES and normal counseling services when used with average tenth-grade students. Whether the DMS treatment would be equally effective with a randomly selected group of students is not known at this time.

Certainty of Vocational Preferences. The posttest form of the CDI included two items intended to collect information about the degree of certainty the student felt about his current and past vocational preferences. These items were:

92. Right now, how certain are you about the kind of work you will be doing when you have finished your schooling?

93. Last year at this time, how certain were you about the kind of work you want to do when you finish your schooling?

The students in the DMS, ECES-ONLY, and control groups were compared on their

responses to these two items. The results of these comparisons are presented in Tables 31 and 32.

Table 31 shows the distribution of responses when the students were asked to report retrospectively on their certainty of vocational choice "last year at this time." The DMS group appeared to be somewhat less certain than either the ECES-ONLY or control groups, but the difference was not significant. When asked to report on certainty of choice "right now," the DMS group appeared much more certain than either the ECES-ONLY or control groups, as seen in Table 32. Forty-two per cent of the DMS group said they were "very certain", compared with 23% for ECES-ONLY and 12% for controls. Only 20% of the DMS group said they were "very uncertain" or "somewhat uncertain"; the figures were 29% for ECES-ONLY and 40% for controls. Thus one might conclude that, in terms of increasing certainty of choice, the DMS treatment was most effective and the ECES-ONLY treatment was somewhat more effective than the usual guidance services received by control students.[5]

Implementation. Having a vocational preference is one thing; acting upon it is something else. Acts which represent the students' attempts to explore the meaning and consequences of their tentative preferences are referred to as acts of implementation. The extent to which a tenth grader can take steps to implement a vocational preference is, of course, limited. Nevertheless certain exploratory steps are available to him. In an attempt to assess the extent of this implementation behavior the three groups were compared on their responses to the following five items, included with the CDI posttest.

94. Right now I am taking the kind of high school courses which will help me in college, in job training, or on the job.

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5. This difference between DMS and ECES-ONLY participants in terms of level and change in certainty of career plans was confirmed by the posttest Student Questionnaire results, as described on page 50.

95. Right now I am taking part in school activities, or out-of-school activities, which will help me in college, in training, or on the job.

96. Right now I am working in a job which will help me get the kind of job or training I want in the future.

97. This summer I will be working in a job which will be related to the kind of work or training I want for the future.

98. Recently I have been talking about my interests to someone who works in an occupation I am considering.

DMS, ECES-ONLY, and control groups were compared on their yes-no responses to these items by chi-square analyses. The groups did not differ significantly in their responses to any of these items.

School-Related Behavior. Though there is no particularly persuasive reason to suspect that either of the treatments represented by the DMS and the ECES-ONLY conditions would be associated with changes in certain in-school behaviors, the availability of the data made it possible to compare the three groups on grade-point average (i.e., the change from ninth grade GPA to tenth grade GPA), number of days absent from school, and dropout rate.

Ninth grade GPA's were obtained for students in the DMS, ECES-ONLY and control groups. In addition, GPA's at the end of the third marking period of the tenth grade were obtained. Table 33 shows the means for the three groups at both periods of time. It is clear from these data that the mean GPA's from the three groups did not change, obviating further curiosity about differential effects of the treatments on students' grade-getting behavior.

Data were also collected on all members of the study who dropped from school during the 1971-72 school year. Only two of the 163 students for whom these data were available had dropped from school. One was in the ECES-ONLY group and one in the control group. With so few drop-outs, obviously no analysis

was feasible or necessary.

Differences among the groups were observed when days absent from school were studied. Students in all three treatment groups were classified as low (0-5 days absent) or high (6 or more days absent). Table 35 shows that control group students had a significantly higher absentee rate than did either DMS or ECES-ONLY students. Seventy-one percent of the control group students were absent six or more days, compared with only 44% for DMS and 36% for ECES-ONLY groups. While the figures in Table 34 clearly indicate a meaningful difference between the groups, it is not clear that the difference should be attributed to treatment effects. If reduction in absentee rate is one of the effects of the DMS and ECES-ONLY treatments, it should be verified through replication studies designed to clarify the rationale for such an effect.

Attitudes Toward ECES

Another relevant source of data concerning the outcomes of the demonstration project are the attitudes of the participants toward the activities involved. For example, What did the students themselves think about the value of using the ECES terminal or attending the DMS sessions? Did the parents get involved? What were their attitudes as influenced by comments made by their children who were participants? How did the counselors feel about the activities involved? Did they see ECES and DMS as helpful to them, as contributing to their students' vocational development, or was it looked upon unfavorably as an interference with on-going guidance activities?

In order to obtain relevant information on the attitudes of the students and their parents, the names and home addresses of the students who were in the ECES-ONLY and the DMS groups were obtained from the counselors. Questionnaires

were mailed to the parents during June and early July, with three follow-up reminders, one week apart, to non-responders.

There was some difficulty in getting complete lists and accurate home addresses. At the time of the writing of this report, questionnaires had been mailed to 147 of the ECES-ONLY students and to 103 of the DMS students. Usable results were obtained from 65 of the ECES-ONLY subjects and 63 of the DMS subjects. Data were used only when there were usable questionnaire results from both student and parent, although questionnaires were used even though the respondent failed to fill in all the blanks.

At the time of this writing, the questionnaires are still coming in, particularly in response to follow-up reminders. The following analysis is therefore based upon only incomplete data and the complete analysis will appear in the supplementary appendix which will be prepared later. However, there are sufficient results currently available to form a reasonably confident opinion as to the attitudes of the participants.

Attitudes of the Students. The Student Questionnaire (see Table 35) included 22 questions involving estimates of the help received, kinds of career exploration engaged in, over-all evaluation of the system, etc. From the responses given, the following questions concerning the students' attitudes can be explored:

1. How helpful were the basic components of the programs to the students in their career planning?

To try to identify the effects of the various components of the program, the respondents were asked to rate the amount of help they had received in the various aspects of career planning from the various components of the program which they had been exposed to depending upon whether they were in the ECES-ONLY or the DMS experimental groups. Questions 4 through 15 of the Student

Questionnaire provided information concerning this question.

One quick way of interpreting the data is to examine the per cent of the respondent groups who gave ratings of either 4 or 5 (i.e. a "considerable amount" or a "great deal" of help) to questions 4 through 15. Table 35 presents these results. From an analysis of these detailed tabulations, the following generalizations can be reported.

In both the ECES-ONLY and the DMS groups, ECES terminal visits received higher ratings than did counselor conferences. For example, the responses to question 5 revealed that among the ECES-ONLY students, 44% found ECES terminal visits helpful in occupational planning and 24% of the students found individual conferences helpful. Among the DMS group, 70% found ECES terminal visits helpful, 39% found counselor conferences helpful, and 39% found DMS group sessions helpful.

This pattern of rating was rather consistent throughout all of the questions 4 through 15, i.e., the ECES terminal visits were found most helpful and the DMS group sessions least. However, the DMS students as a group gave higher ratings of helpfulness in practically all of the aspects of career planning. This suggests that although the DMS group sessions in themselves were not rated as highly as the terminal visits or individual counselor conferences, they probably served a facilitating function and made the terminal visits and the counselor conferences more effective. This obviously is an inference but a rather clear one, based on the consistency of the data.

Another interesting observation can be made by identifying the specific kinds of help which received the highest ratings for each of the components. When this was done, it was apparent that, for the ECES-ONLY group, ECES terminal visits were particularly helpful in those aspects of career planning having to do with occupational planning and decision-making (questions 5, 9, 11, and 13) whereas the counselor conferences were regarded as most helpful in educational

planning and decision-making (questions 4, 12, 14). This pattern was also apparent in the DMS group but not as clear cut.

2. What effect did participation in the project have on interactions with parents and counselors and on the career planning activities?

Questions 16 to 21 in the questionnaire deal with a miscellany of outcomes of participation, which can be considered to represent various kinds of career planning activities. From Table 35 it is apparent that the DMS group were more active than the ECES-ONLY group, particularly in being stimulated to talk with their counselors and with their parents about their experiences with the system and in exploring new occupations and possible majors. For example, 63% of the DMS group reporting exploring four or more new occupations that they had not previously known about (question 16) whereas only 26% of the ECES-ONLY group reported likewise. Almost 86% of the DMS group reported believing that because of using ECES they would profit more from talks with their counselor (question 18) whereas 64% of the ECES-ONLY group reported likewise. Almost 65% of the DMS group reported that they discussed ECES with their parents three or more times whereas only 40% of the ECES-ONLY group so reported.

The above observation should not minimize the fact that even the ECES-ONLY group were stimulated to engage in a considerable amount of career planning activity and considerable exploration of facts about themselves or the world of education and work through exposure to the system. It demonstrates, however, rather clearly that supplementing ECES terminal visits with organized DMS group sessions does stimulate or facilitate the hoped-for outcomes of the ECES system itself.

3. Did the groups differ as to definiteness of future career plans?

Questions 2 and 3 of the Students' Questionnaire yielded data on this

question. From Table 35 it can be seen that both the ECES and the DMS groups reported becoming more definite about their future plans during the period between the end of the ninth grade and the tenth grade. This was particularly true in the case of the DMS students.

The ECES-ONLY students reported that at the end of the ninth grade only about 20% were rather definite or very definite about their future plans while at the end of the tenth grade 50% of the ECES-ONLY group reported this dgree of definiteness. In the case of the DMS students, only 16% reported definiteness at the e of the ninth grade with 63% at the end of the tenth grade. If we look at the 46 ECES-ONLY students who reported ninth-grade uncertainty (responses 1 or 2 or 3 on the questionnaire) we find that 19 of them (41%) reported definiteness (responses 4 or 5) at the end of the tenth grade. Similarly of the 52 DMS students who reported uncertainty at the end of the ninth grade, 31 (60%) had moved to the definite categories by the end of the tenth grade. Only a few individual subjects reported being less certain now than in the previous year and 60% of the ECES-ONLY and 75% of the DMS students reported being more certain now (question 2) than at the end of the ninth grade (question 3).

It must be recongnized, of course, that not all of this change can be attributed to participation in the ECES demonstration project. We did not get questionnaire data from the students in the control group so at this point we do not know how much of this change can be attributed to merely the passage of time or to the regular guidance program activities and how much to ECES.

4. What was the students' attitude towards the value of ECES as a whole, including terminal visits and counselor conferences in the ECES-ONLY group and terminal visits, counselor conferences, and the DMS group sessions in the DMS group?

Analysis of the responses to question 22 reveals quite clearly that both the ECES-ONLY and the DMS groups had positive attitudes toward their experiences. Only 6% of the DMS respondents reported that their experience was of little value in career planning and 15% of the ECES-ONLY group so reported. Of the DMS group, 71% rated the experience as of considerable or of great value in planning and 42% of the ECES-ONLY group gave similar responses.

In summary, the responses of the students on the Student Questionnaires filled out at the conclusion of their tenth grade ECES experience provide encouraging evidence of the positive feelings of the students toward that experience. In general they found participation in the ECES project to be of considerable value, they moved along in the definiteness of their career plans, they engaged in career planning activities and in interactions with counselors and parents, and they found the terminal visits and the DMS group sessions of considerable help in occupational planning and in stimulating interactions with their counselors on educational and occupational planning.

Attitudes of Parents. Analysis of the questionnaires from the 65 parents of the ECES-ONLY subjects and from the 63 parents of the DMS subjects yielded results which were congruent with those of their students in terms of generally favorable attitude toward ECES. In the case of the Parent Questionnaires, the interest was primarily in finding out whether they thought that their children had received benefits from participation and also whether or not the experience had led to significant interaction between the parent and the child concerning the student's career development. In the original development of the system, it was hoped that the system would lead to more interaction between students and their parents about career planning and that the parents would become more directly involved.

Questions 1, 2, and 3 of the Parent Questionnaire deal with the question of parental involvement. The results of Question 3 (see Table 36) showed that 65% of the DMS parents reported that they become more involved in their childrens' educational or vocational planning and 43% of the ECES students' parents so reported.

Question 1 revealed that in the case of both groups the students had discussed with their parents various aspects of the ECES experience, 44% of the DMS parents reporting regular or quite a lot of discussion and 22% of the ECES-ONLY reported this amount of discussion. Only 5% of the DMS parents reported that their children had not discussed it at all and 14% of the ECES-ONLY students so reported. It may be that in the case of the ECES-ONLY, these were the students who had had little or no real exposure to the program although they were technically in the ECES experimental group.

Analysis of Question 2 responses showed that the activities most frequently discussed by students and their parents included terminal visits, counselor conferences and reading about occupations. Reading about what schools to go to after high school was less engaged in by both groups. This may be because, as tenth graders, they thought that this problem could be postponed until at least the following year. As in the case of the student responses, there appeared to be less interaction between students and their parents concerning the DMS sessions, since only about 50% of the DMS students reported discussing them with their parents on <u>all</u> aspects of the ECES program, thereby reinforcing the observation made above that the group decision-making sessions raised the level of activity of career planning in general as compared with the ECES-ONLY program.

Question 6 dealt with kinds of activities engaged in by the parents with

respect to their childrens' career planning. Again we find that the DMS parents were more active than the ECES-ONLY parents, although neither parent group reported much in the way of meeting with the school guidance counselor or in obtaining private counseling for their children. Greatest activity was found in encouraging their children to talk with individuals already employed in careers being considered or in obtaining occupational information to assist their children to decide on future plans. Approximately one quarter of the parents in both groups reported helping their children find summer employment related to career goals. Over half of the DMS parents reported making sure that their son or daughter was meeting the counselor whereas only about a third of the ECES-ONLY parents so reported. Again one can make no comparisons with a control group of parents whose children were in neither ECES nor DMS, so it cannot be reported that this amount of parental activity was relatively high or low. However, it appears to be more than the usual parental involvement as experienced in most school situation.

Question 4 dealt with the amount of help which the parent felt that their children were receiving from ECES, help in such career planning aspects as seeing connections between school experiences and future plans, getting useful facts about the world of work, seeing connections between interests and abilities and occupations, etc. Here the results were quite encouraging, particularly in the case of the DMS parents. For example, 74% of the DMS parents reported that their children received a great amount of help in seeing connections between their childrens' interests and possible occupations and 64% on connections between abilities and occupations. The comparable percentages in the ECES-ONLY group were 46 and 40% respectively. In general, the DMS parents gave higher estimates than did the ECES-ONLY parents, but the relative estimates among the seven activities listed in the questionnaire were remarkably

similar. It appears that exposure to the ECES system in general resulted, at least as perceived by the parents, in their children learning about the relationships between personal characteristics and occupational possibilities, getting useful facts about the world of work, and discovering new educational and occupational opportunities to look into. The lowest estimates, although still significantly high, were in seeing connections between high school experience and future plans and in making good decisions about what to do after high school. This confirms the finding on the student questionnaires that the system had greater impact on occupational planning than on educational planning.

Finally, Question 5 asked the parents whether they thought their son or daughter would be better able to make decisions about careers as a result of participating in the ECES program. The overall evaluation yielded highly positive results, with 81% of the DMS parents and 59% of the ECES-ONLY parents checking the positive end of the four point scale.

In summary, it can be rather confidently concluded (1) that the parents of both groups had a generally positive attitude toward the ECES program, (2) that the participation in DMS group sessions facilitated and increased the effects of exposure to ECES, particularly in terms of understanding of oneself in relation to occupational possibilities, and (3) that it resulted in increased interaction between parents and children concerning positive steps which their children should be taking in looking forward to their post high school careers.

Attitudes of the School Counselors. The third group in the "consumer attitude" evaluation of the ECES program consisted of the counselors in the schools where the experimental groups were located. In order to probe as intensively as

possible the attitudes of this significant group, a combination of questionnaire and interview was used. The Counselor Reaction Questionnaire (see Appendix) was a brief one consisting of 18 statements about which the counselors were asked to express an opinion. The counselors filled them out individually as part of an individual interview session and immediately upon completing the questionnaire, the interviewer questioned the respondent concerning some of the questions and also asked some open-ended over-all evaluation questions.

It is somewhat difficult to draw firm conclusions from the counselor data since the counselors were not assigned at random to the experimental groups nor had they had comparable orientation to the programs. In addition, even though the interviews were held late in the semester, the counselors' students were at different stages in their exposure to ECES. In fact, some of the ECES-ONLY students had not yet been on the terminals at all. It should also be kept in mind that a given counselor had many more students than those participating in the program and that they had to respond to the questionnaire only in terms of their recollections of those students under their guidance who were members of an experimental group. However, a given counselor had students either from the DMS or the ECES-ONLY experimental group but not both. Detailed data will be given concerning the questionnaire and interview responses in a later supplementary report. However, at this point, the following observations or interpretations of responses can be made:

1. The DMS counselors were more involved in the program than were the ECES-ONLY counselors, both in terms of time spent and in identification with the program. For example, all 13 of the DMS counselors interviewed reported that they felt that they were an important participant in the ECES field trial

whereas only 4 of the 11 ECES-ONLY counselors made a similar response. These attitudes were confirmed by the kinds of observations made by the DMS counselors in discussing their role.

2. All of the counselors, both DMS and ECES-ONLY, agreed that the ECES system was useful and that it stimulated the students to learn about themselves. However, some of the ECES-ONLY counselors agreed that terminal exposure alone may create student uncertainties which need resolution by group or individual sessions. It may be recalled from the data from the student and parent questionnaires that DMS participation did stimulate more group and individual counselor sessions and threrfore it may be inferred that these uncertainties would have more probability of being resolved. From a learning point of view, one also might argue that learning occurs best when there is some challenge to one's current status and that uncertainty without anxiety is probably beneficial.

3. Both groups of counselors agreed that ECES was useful at all grade levels 9 through 12, although there was less agreement as to its use in the ninth grade.

4. Some of the counselors reported that ECES alone is difficult for some students, particularly in following the decision-making strategies and in using the charts without counselor help.

5. There was common agreement, within both groups of counselors, that the students enjoyed the terminal experiences, whether alone or in combination with the DMS group sessions. There was agreement among the DMS counselors that the students found the group sessions useful but several observed that it was easy for the sessions to become too much like a regular school subject and for the assignments to be looked upon as chores or as repetitious rather than challenging. In fact, some counselors reported a gradual deciline in use of the assignments and at least one counselor used part of the group sessions for what amounted to

supervised study rather than having the assignments done outside.

6. There were differences between the ECES-ONLY and the DMS counselors as to the nature of their involvement. Particularly in the case of the ECES-ONLY counselors, some of the counselors were not clear as to what their role was to be. Some had not yet seen their subjects and some had had them assigned only recently. Some of them had had inadequate orientation. This was in contrast to the DMS counselors who had received better orientation and felt more involved.

7. One question dealt with the effect the presence of the ECES-ONLY and the DMS program had upon the counselors' total work load. The DMS counselors' involvement required extra work which made it more difficult for them to meet the total students needs. For example, seven of the DMS counselors agreed that "ECES/DMS has caused me to see types of students I did not previously see." It is interesting, however, that nearly all of both groups of counselors interviewed agreed that "the extra work created by ECES/DMS is justified by the effects on the students" and most of the counselors agreed that their "work with students was at a much higher level because of ECES/DMS."

8. One major concern of the counselors, those with generally positive attitudes toward ECES as well as those less positive, was about how the system could be made operational on a regular basis. They agreed that it would not be feasible just to add ECES and DMS group sessions on top of everything else and still expect counselors to maintain the caseloads which they now have or to remain as involved in routine administrative activities or to continue being given responsibilities for "non-guidance" programs such as now are frequently assigned to counselors. The most positive attitudes appeared to be from those counselors who were able to reorganize their work situation in order to devote

a considerable time to the experimental group. They tended to find it exciting. Those for whom this was merely an addition to their load were obviously less involved and usually less positive. Several of the counselors had practical suggestions as to how the DMS sessions and ECES terminal supervision could be carried without increasing their load and as to how to make their sessions with the students more valuable.

In summary, it is fair to conclude that the counselors involved took a basically positive attitude toward the value of the availability of ECES terminal visits for their students and also for the group sessions designed to improve the decision-making ability of their students. Exposure to the system was regarded as valuable, particularly in the tenth and eleventh grades. The chief problem appeared to be in integrating the system into the total guidance program in ways which would take advantage of its usefulness and yet be feasible in terms of counselor work-load and total responsibilities. The responses clearly indicated that when the students and the counselors were really involved, both in time and in interest, the belief was that the program made substantial contributions to tne career development of the student participants.

V. SUMMARY AND CONCLUSIONS

The computer-based Educational and Career Exploration System (ECES), developed at the Advanced Systems Develpment Division of the International Business Machine Corporation, has been subjected to two and one-half academic years of field trials. The first trial took place in Montclair, New Jersey High School during the Spring term of 1969. A sample of 160 students used ECES during the trial. The following findings resulted:

a. ECES could be installed and maintained in a secondary school.

b. ECES was appropriate for both male and female high school students of all grades, for both black and white students, and for the college-bound as well as non-college-bound.

c. During the brief trial, little measurable effect on the vocational maturity of the students was observed.

d. The students, their parents, and the counselors were highly positive in their reactions to ECES.

Following the Montclair trial, ECES was extensively revised and adapted for a second trial to be carried out in Genesee County, Michigan. During the 1970-71 academic year, ECES was used by approximately 3,000 tenth-grade students from 13 experimental high schools in Genesee County. The students were compared, before and after using ECES, with an approximately equal number of students from control high schools matched to the experimental schools. From the 1970-71 field trial, the following conclusions seemed justified:

a. The Career Development Inventory (CDI), constructed for the field trial, provided a reliable measure of vocational maturity.

b. The restrictions on the students' use of ECES during the trial limited

the definitiveness of the findings. Less than 6% of the students had the opportunity to use ECES for as many as four hours, in contrast to the mean of 6.7 hours for Montclair tenth-graders in the 1969-70 study.

c. The reactions of the students to ECES were overwhelmingly favorable.

d. Students who used ECES showed improvement slightly greater than non-users in terms of the quality of potential occupational resources they knew about and the quality of the occupational resources they actually used. Other aspects of vocational maturity, such as planning orientation, quality of decision making, and information possessed, were not affected.

e. The counselors approved of ECES when asked to consider its effects on students and when asked to consider the specifics of the system.

Summary: The 1971-72 Field Trial

Having benefited from two previous trials, the plans for the second year of the Genesee County trial were more carefully made. To begin with, the computer terminals with which the student used ECES were removed from a central location and placed in the schools the student users were attending. Secondly, care was taken to insure that some students used ECES for more hours than had been the case during the previous year. The CDI was improved and used again, and the carefully matched and randomly designated experimental and control schools were once again employed. Finally, a demonstration project was conducted to assess ECES usefulness under the best of available conditions.

Results: Vocational Maturity. Most tenth-graders in both the experimental and control schools were given the CDI at the beginning of the academic year;

more than 10,000 students were tested. Near the end of the school year, after students at the experimental schools had used ECES, a posttest was attempted in both experimental and control schools. The posttest yielded 2245 usable tests, 792 from students who had used ECES. Analyses of covariance led to the findings listed below:

a. ECES users showed larger gains than non-users both in degree of planning orientation (CDI, Scale A) and in choice and use of resources for exploration (CDI, Scale B).

b. Users did not differ from non-users in quality of decision making and amount of (occupational career) information possessed (CDI, Scale C).

c. There was a significant positive relationship between the amount of time a student used ECES and the amount of pre- to posttest gain on CDI Scales A and B.

d. Although the differences described above were highly significant from a statistical point of view, they were small in absolute terms.

A separate analysis was attempted to assess possible delayed effects of using ECES during the tenth grade on selected eleventh-grade students. No delayed effects were observed.

Results: Demonstration Project. Recognizing that attempting to involve nearly 120 counselors from 26 high schools in the field trial would lead to irregularities of control and treatment conditions, a demonstration project was designed in order to provide a trial for ECES under the best available conditions. The demonstration project included three conditions: (1) group sessions involving the Decision Making Syllabus (DMS); (2) terminal time on ECES without specially structured supporting counselor activity (ECES-ONLY); and (3) a control condition

involving neither DMS or ECES-ONLY.

Fourteen counselors were selected for each of the three conditions and each counselor was asked to select 15 students to comprise his group. The counselors selected for the DMS condition were especially chosen for their interpersonal skills and enthusiasm for ECES. No such criteria were applied in selecting the counselors for the other two conditions. The ECES-ONLY counselors carried on guidance services as usual at experimental schools. The control counselors did the same at control schools.

DMS counselors conducted a specially tailored, educational program for teaching decision-making skills. The DMS program had as its goals:

a. to provide counselors with a systematic program to facilitate and direct their efforts to develop career decision-making skills in students;

b. to provide the counselors with a systematic program to maximize the students' exploration and utilization of ECES within the context of his career decision-making skill acquisition; and

c. to provide the student with a systematic program that increased the quantity of career decision-making skills he needs to make more systematic and logical career decisions.

The DMS condition included ten classroom sessions, three personal visits with the counselor, and four hours of ECES use. To assess its effects, a Career Decision Making Skills test was especially constructed and administered before and after the student experienced the DMS. ECES-ONLY and control students were also tested for comparison.

The comparisons led to the following tentative findings.

a. The DMS group gained significantly more than the ECES-ONLY and the control groups in career decision-making skills and in planning

attitudes and insights, as measured by the Career Decision Making Skills test.

b. CDI scores for the three groups, when submitted to an analysis of covariance, indicated that the DMS treatment produced greater gains in attitudinal dimensions of vocational maturity (Scales A and B), but not in decision making and information (Scale C).

c. The DMS group appeared to be much more certain of their career futures than either the ECES-ONLY or control groups.

d. The DMS and ECES-ONLY groups did not differ in the extent to which they had taken steps to implement their present career plans.

e. None of the special conditions influenced students' grade-point averages.

f. Control group students had a significantly higher school attendance absentee rate than either DMS or ECES-ONLY students.

g. All students reported enthusiasm for ECES and estimated that they were helped by it in planning their futures. DMS students were, in general, more positive than ECES-ONLY students, but both were highly positive.

h. Parents of both DMS and ECES-ONLY students had generally positive attitudes toward their children's experiences. Participation in the DMS clearly facilitated and increased the effects of the exposure to ECES. Both DMS and ECES-ONLY treatments resulted in increased interaction between parents and children concerning the children's futures. The DMS effects were the more powerful.

The counselors involved in both the DMS and the DMS and the ECES-ONLY conditions took a basically positive attitude toward the value of the experiences. They regarded the experiences as valuable, especially for tenth and eleventh

graders. The more extensive and time-consuming nature of the DMS led to counselor reservations about integrating such a program into the total guidance program. However, there was wide agreement that the values of the DMS procedure justified the struggle with the feasibility problem.

Conclusions

In arriving at conclusions about the 1971-72 field trial, and those that preceded it, it is tempting to react to the events and findings described herein with the rigor and caution one usually applies to research procedures and evidence. Yet, as we have tried to portray throughout the report, this effort was a field trial and not, in the strictest sense, a research effort. In the design of data collection efforts we have attempted to infuse rigor where possible and to control for biases that would lead the reader astray. Our success at doing so has been only partial.

But rigorous or biased, a great deal of data have been collected, analyzed and reported. While the normal operations of 26 high schools in Genesee County proceeded, an enormous educat onal innovation was incorporated. As with any field trial, some routines were disrupted and some people were inconvenienced. As with any field trial, the elegance of instrumentation and data collection fell short of fondest hopes but by far exceeded worst fears. As with any field trial, plans were changed as they were being implemented, but unforeseen necessities and unpredicted resistance did not invalidate the enterprise.

The conclusions offered below are necessarily tentative. They are, however, the result of the assessment team's best judgments about the efficacy of ECES and its use.

1. The students who use ECES enjoy using it, find it easy to use, and feel that they benefit from it. This conclusion is offered with confidence based on almost totally supporting evidence from Montclair, from Genesee County in 1970-71, and again in Genesee County in 1971-72. The evaluation team recommends that no further concern be devoted to this issue.

2. The parents of students who use ECES are pleased with it, want it to be available to the children, and-most important- become more involved in the planning efforts of their children. This too is a repeated finding and one deserving of confidence. Clearly, more intensive study of how parents become involved and how long that involvement persists would be of some value. Nevertheless, parents' acceptance of the innovation has been established.

3. Counselors in schools where ECES is available to students value it highly, estimate that it has a positive effect on students and think it ought to be available to more students. To their credit, counselors are not totally uncritical of the innovation. They have formed many useful suggestions for the revision of ECES and for its use in the schools. They have recognized that such a system does call for changes in their professional functioning. By and large, they are accepting of these changes.

4. Students who use ECES show small but clearly real gains in two important aspects of vocational maturity: planning orientation and choice and use of resources for exploration. ECES alone does not lead to gains in decision making or occupational information possessed. The evaluation team is less confident of this conclusion than of those that precede it. To begin with, it is strongly suspected that the conditions of the field trial never resulted in ECES being used for a sufficient amount of time (see conclusion 5) by large numbers of students. Secondly, it must be born in mind that the instrument used to measure vocational maturity, the CDI, is still in an experimental form and may lack

precision. All of that not withstanding, irrefutable evidence of small gains in attitudinal aspects of vocational maturity has been presented. That such evidence resulted despite data collection problems of major proportions is extremely encouraging.

5. The more time a student uses ECES, the more gain the student shows in planning orientation and choice of resources for exploration. This conclusion is drawn confidently on the basis of the data collected, but it does have limits as a generalization. The data suggest that there may be an optimal use time beyond which corresponding gains may not be expected. Students who used ECES for from five to seven hours showed gains that were meaningfully larger than those using ECES for from two-to-four hours. Those who used ECES for more than seven hours did not show correspondingly larger gains. However, from these data it is not possible to identify an optimal use time with confidence.

6. When combined with a carefully planned program for developing decision-making skills, the use of ECES contributes to meaningful gains in planning orientation, choice of resources for exploration, and in the decision making skills. The data to support this conclusion are those from the demonstration project. They demonstrate that when ECES was accompanied by a systematic training program, mediated by carefully chosen counselors, for the benefit selected students, the gains for those students were superior to those of students who used ECES alone.

The suggestion from these findings seems hardly debatable: who the counselor is and what he does matters with respect to the effects of ECES. If only ECES is made available to students and counselors, a variety of use strategies and highly variable effects on students will result. If, however, ECES is

supplemented by careful attention to the human resources which support it, i.e. a systematic plan for counselor activity, the original goals of ECES development will more likely be realized.

Finally, it seems appropriate to suggest that the efficiency of ECES and its use need not be subjected to further studies of the large-scale field trial variety. The general facts that (1) it can be comfortably added to a high school guidance program, (2) students will use it with enthusiasm, and (3) with appropriate counselor-mediated conditions students will benefit from that use, seem well established. Further investigations, therefore, ought to begin with these facts as assumptions and focus on more carefully controlled approaches to educationally relevant issues.

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Table 1

CDI (Scale A) Pretest, Posttest, and Adjusted Means and Standard Deviations

For Tenth-Grade User and Control Groups, by Sex.

Treatment Group	Sex	Number	Pretest Mean	Pretest Stnd. Dev.	Posttest Mean	Posttest Stnd. Dev.	Adjusted Mean
ECES Users	Male	376	95.3	19.6	103.2	22.2	104.4
	Female	415	95.2	20.8	104.6	22.0	105.9
Controls	Male	718	99.0	19.6	103.9	20.1	102.6
	Female	738	97.3	20.3	103.4	21.2	103.2
Totals		2247	97.1	20.1	103.7	21.2	

Table 2

Two-Way Analysis of Covariance of CDI (Scale A) Pre-and Posttest Scores

For Tenth-Grade User vs. Control Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	2601.6	1	2601.6	9.8*
Sex	588.5	1	588.5	2.2
Interaction	90.1	1	90.1	0.3
Mean	134234.5	1	134234.4	506.4*
Covariates	414102.8	1	414102.8	1562.1*
Error	594346.9	2242	265.1	

* Significant at the .01 level ($p < .01$)

Table 3

CDI (Scale B) Pretest, Posttest, and Adjusted Means and Standard Deviations For Tenth-Grade User and Control Groups, by Sex

Treatment Group	Sex	Number	Pretest Mean	Pretest Stnd. Dev.	Posttest Mean	Posttest Stnd. Dev.	Adjusted Mean
ECES Users	Male	376	230.6	44.2	239.9	52.6	243.8
	Female	415	239.0	48.4	255.0	48.2	254.1
Controls	Male	718	236.3	49.5	239.4	50.9	240.0
	Female	738	241.0	49.6	249.2	49.4	247.2
Totals		2247	237.4	48.6	245.6	50.6	

Table 4

Two-Way Analysis of Covariance of CDI (Scale B) Pre- and Posttest Scores For Tenth-Grade User vs. Control Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	14637.8	1	14637.8	8.2*
Sex	39327.6	1	39327.6	22.1*
Interaction	1287.9	1	1287.9	0.7
Mean	1137018.3	1	1137018.0	639.2*
Covariates	1677797.9	1	1677797.9	943.2*
Error	3988222.9	2242	1778.9	

* Significant at the .01 level ($p < .01$)

Table 5

CDI (Scale C) Pretest, Posttest, and Adjusted Means and Standard Deviations For Tenth-Grade User and Control Groups, by Sex

Treatment Group	Sex	Number	Pretest Mean	Pretest Stnd. Dev.	Posttest Mean	Posttest Stnd. Dev.	Adjusted Mean
ECES Users	Male	376	15.9	5.3			16.2
	Female	415	16.6	4.7			17.0
Controls	Male	718	15.9	5.3			16.9
	Female	738	17.1	4.9			17.0
Totals		2247	16.4	5.1			

Table 6

Two-Way Analysis of Covariance of CDI (Scale C) Pre- and Posttest Scores For Tenth-Grade User vs. Control Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	54.9	1	54.9	2.8
Sex	116.2	1	116.2	5.9*
Interaction	53.6	1	53.6	2.7
Mean	9187.0	1	9187.0	469.3
Covariates	21232.8	1	21232.8	108.7
Error	43887.7	2242	19.6	

* Significant at the .05 level ($p < .05$)

Table 7

CDI (Scale A) Tenth-Grade Means and Standard Deviations by Number of Hours of ECES Use-Time

Time Spent on ECES	Number	Pretest Mean	Pretest Stnd. Dev.	Posttest Mean	Posttest Stnd. Dev.	Adjusted Mean
Less than One Hour	101	91.6	19.4	96.0	22.3	98.1
1 - 2 Hours	308	94.9	20.3	101.9	20.6	102.1
2 - 3 Hours	176	94.4	21.3	102.6	21.4	103.0
3 - 4 Hours	87	96.8	18.5	108.5	21.6	107.5
4 - 5 Hours	57	100.9	18.5	116.3	23.3	112.9
5 - 6 Hours	28	92.3	23.0	105.7	25.7	107.5
6 - 7 Hours	13	103.5	21.8	123.1	16.1	118.1
More than 7 Hours	21	100.0	17.3	115.8	18.4	112.9
Totals	791	95.2	20.2	103.9	22.1	

Table 8

One-Way Analysis of Covariance of CDI (Scale A) Tenth-Grade Pre- and Posttest Scores by Number of Hours of ECES Use-Time

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	14732.2	7	2104.6	6.8*
Covariates	116878.0	1	116878.0	378.2
Mean	76539.3	1	76539.2	247.7
Error	241664.5	782	309.0	

* Significant at the .01 level ($p < .01$)

Table 9

CDI (Scale B) Tenth-Grade Means and Standard Deviations by Number of Hours of ECES Use-Time

Time Spent on ECES	Number	Pretest Mean	Pretest Stnd. Dev.	Posttest Mean	Posttest Stnd. Dev.	Adjusted Mean
Less than 1 Hour	101	223.4	39.3	225.1	57.2	230.8
1 - 2 Hours	308	234.0	44.5	245.2	47.1	245.7
2 - 3 Hours	176	237.3	53.7	246.5	48.8	245.3
3 - 4 Hours	87	231.3	39.2	251.7	42.5	253.5
4 - 5 Hours	57	251.9	46.6	274.1	52.7	265.8
5 - 6 Hours	28	223.7	49.1	265.3	63.8	270.9
6 - 7 Hours	13	260.9	57.2	290.8	49.0	278.0
More than 7 Hours	21	255.0	43.5	271.1	41.2	261.3
Totals	791	235.0	46.6	247.8	50.9	

Table 10

One-Way Analysis of Covariance of CDI (Scale B) Tenth-Grade Pre- and Posttest Scores by Number of Hours of ECES Use-Time

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	82634.1	7	11804.9	6.1*
Covariates	400345.3	1	400345.2	207.5
Mean	526634.4	1	526634.4	273.1
Error	1508413.8	782	1928.9	

* Significant at the .05 level ($p < .05$)

Table 11

CDI (Scale C) Tenth-Grade Means and Standard Deviations by Number of Hours of ECES Use-Time

Time Spent on ECES	Number	Pretest Mean	Pretest Stnd. Dev.	Posttest Mean	Posttest Stnd. Dev.	Adjusted Mean
Less than 1 Hour	101	15.2	5.5	15.2	6.1	15.9
1 - 2 Hours	306	16.2	5.0	15.9	6.0	15.9
2 - 3 Hours	176	15.8	4.9	16.3	5.5	17.1
3 - 4 Hours	37	17.0	4.6	16.0	4.7	17.0
4 - 5 Hours	57	17.6	4.6	16.4	5.4	17.0
5 - 6 Hours	25	17.5	4.2	17.9	4.9	17.1
6 - 7 Hours	13	16.5	5.5	17.0	5.0	16.6
More than 7 Hours	21	17.3	4.3	17.2	4.3	16.0
Totals	79	16.3	5.0	16.5	5.8	

Table 12

One-Way Analysis of Covariance of CDI (Scale C) Tenth-Grade Pre- and Posttest Scores by Number of Hours of BOES Use-Time

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	414.3	7	59.2	2.6
Covariates	7590.4	1	7590.4	330.9
Mean	2530.8	1	2530.8	110.3
Error	17935.2	782	22.9	

Table 13

Eleventh-Grade CDI (Scale A) Means, Adjusted Means, and Standard Deviations For User and Control Groups, by Sex

Treatment Group	Sex	Number	10th-Grade Posttest Mean	10th-Grade Posttest Stnd. Dev.	11th-Grade Posttest Mean	11th-Grade Posttest Stnd. Dev.	Adjusted Mean
ECES Users	Male	17	113.2	11.7	107.3	13.2	109.3
	Female	36	112.0	20.2	112.1	1[illegible].1	110.[illegible]
Controls	Male	27	109.9	18.9	102.7	2[illegible].[illegible]	102.2
	Female	44	103.9	20.4	108.9	24.1	111.1
Totals		124	10[illegible].[illegible]	19.2	108.3	22.[illegible]	

Table 14

Two-Way Analysis of Covariance of Eleventh-Grade CDI (Scale A) For User vs. Control Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	43.0	1	43.0	0.1
Sex	1370.5	1	1370.5	3.1
Interaction	27.5	1	27.5	0.2
Mean	11858.3	1	11858.3	27.2
Covariates	8860.4	1	8860.4	20.4
Error	51789.8	119	435.2	

Table 15

Eleventh-Grade CDI (Scale B) Means, Adjusted Means, and Standard Deviations

For User vs. Control Groups, by Sex

Treatment Group	Sex	Number	10th-Grade Posttest Mean	10th-Grade Posttest Stnd. Dev.	11th-Grade Posttest Mean	11th-Grade Posttest Stnd. Dev.	Adjusted Mean
ECES Users	Male	17	250.7	29.4	247.1	23.7	245.2
	Female	31	250.0	37.5	279.6	[illegible].9	278.2
Controls	Male	27	256.9	45.8	255.3	[illegible].3	250.3
	Female	44	239.4	50.2	258.9	47.1	263.9
Totals		124	247.[illegible]	43.4	262.5	43.8	

Table 16

Two-Way Analysis of Covariance of Eleventh-Grade CDI (Scale B)

For User vs. Control Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	594.2	1	594.2	0.5
Sex	14680.7	1	14680.7	12.6**
Interaction	2554.1	1	2554.1	2.2
Mean	43321.2	1	43321.2	37.2
Covariates	81310.0	1	81310.0	9.9
Error	138459.3	119	1163.5	

* $p < .01$

Table 17

Eleventh-Grade CDI (Scale C) Means, Adjusted Means, and Standard Deviations

For User vs. Control Groups, by Sex

Treatment Group	Sex	Number	10th-Grade Posttest Mean	10th-Grade Posttest Stnd. Dev.	11th-Grade Posttest Mean	11th-Grade Posttest Stnd. Dev.	Adjusted Means
ECES Users	Male	17	17.2	4.5	18.8	4.1	19.3
	Female	30	19.1	4.6	20.1	4.7	19.4
Controls	Male	27	17.1	5.5	16.4	7.4	17.0
	Female	44	15.1	4.4	20.7	3.3	20.4
Totals		124	18.1	4.7	19.3	5.3	

Table 18

Two-Way Analysis of Covariance of Eleventh-Grade CDI (Scale C)

For User vs. Control Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	8.3	1	8.3	0.5
Sex	94.4	1	94.4	5.4*
Interaction	87.2	1	87.2	5.0*
Mean	482.6	1	482.6	27.8
Covariates	1033.0	1	1033.0	59.5
Error	2064.3	119	17.3	

* $p < .05$

Table 19 CDMS Item 12

Item		Group: Control Pre	Control Post	ECES-ONLY Pre	ECES-ONLY Pre ECES	ECES-ONLY Post ECES	DMS Pre	DMS Pre ECES	DMS Post ECES	CDMS
1	N	64	61	87	81	79	105	89	91	96
	Means	3.5	3.9	3.5	3.3	4.1	3.5	3.0	3.6	4.4
	S.D.	1.0	.9	.9	1.0	.89	.9	1.3	.9	.8
2		65	62	86	80	80	106	89	88	97
		3.5	3.9	3.7	3.3	3.9	3.5	2.9	3.7	4.3
		.9	.9	1.0	1.0	1.0	1.	1.3	.9	.8
3		63	62	86	78	78	106	87	90	97
		3.2	3.4	3.3	3.1	3.9	3.1	2.9	3.6	4.2
		1.0	1.0	1.0	.9	.9	1.1	1.2	1.0	.9
4		65	60	86	77	78	105	86	87	94
		2.9	3.1	3.1	2.7	3.4	3.1	2.6	3.3	4.0
		1.2	1.1	1.2	1.1	1.1	1.2	1.3	1.2	1.2
5		65	62	85	78	76	106	89	88	97
		3.5	3.6	3.6	3.3	3.8	3.4	2.9	3.6	4.2
		1.1	1.0	1.1	1.1	1.1	1.2	1.1	1.0	.9
6		65	62	86	79	79	106	88	89	97
		2.9	3.2	3.0	2.9	3.5	2.9	2.4	3.0	3.7
		1.0	1.1	1.0	1.0	1.0	1.0	1.0	.9	1.0
7		65	62	85	80	78	105	89	89	96
		2.9	3.3	3.1	3.0	3.6	2.9	2.6	3.4	4.2
		.9	1.0	.9	1.0	1.0	1.0	1.0	1.0	.8
8		63	64	86	78	78	105	88	90	95
		2.9	3.0	3.1	3.0	3.4	2.9	2.6	3.3	4.0
		1.0	1.0	.9	1.0	1.1	.9	1.1	1.0	.9
9		65	62	85	80	78	106	84	87	93
		3.2	3.4	3.4	3.1	3.7	3.3	2.7	3.6	4.2
		1.0	.9	1.0	1.0	1.0	.9	1.2	1.1	.9

Table 19 CDMS Item 12 (Continued)

		Control		ECES-ONLY			DMS			
		Pre	Post	Pre	Pre	PostECES	Pre	Pre	PostECES	CDMS
ITEM										
10	N	63	60	85	79	78	106	83	87	92
	Means	3.0	3.3	3.2	3.0	3.7	3.1	2.4	3.6	4.1
	S. D.	.9	.9	.9	.9	.9	.9	1.1	.9	.8
11		65	61	86	80	77	105	83	85	91
		3.2	3.5	3.2	3.1	3.9	3.2	2.9	3.7	4.2
		.8	.9	1.0	.9	.9	.9	1.1	1.0	1.0
12		63	61	85	81	75	105	83	86	93
		3.3	3.4	3.2	3.1	3.8	3.3	2.8	3.6	4.2
		.9	1.0	1.0	.9	.8	.9	1.1	.9	.8
13		64	62	84	79	77	104	83	85	94
		3.2	3.5	3.5	3.3	3.9	3.3	2.7	3.4	4.1
		.9	.8	.9	1.0	.8	1.0	1.1	1.0	.9
14		65	62	85	81	75	104	83	85	94
		3.4	3.6	3.6	3.3	3.9	3.4	2.8	3.5	4.3
		1.0	.9	1.0	1.0	.9	.9	1.1	1.0	.9

Table 20

Mean Counselors' Ratings of Students' Preparedness on Items of the CDMS Test

	Before using ECES	After using ECES	Gain
Item 1	2.5	3.7	1.2
2	2.5	3.7	1.2
3	2.4	4.2	1.8
4	2.0	3.6	1.6
5	2.6	4.1	1.5
6	2.1	3.5	1.4
7	2.3	3.5	1.2
8	2.3	3.6	1.3
9	2.2	4.2	2.0
10	2.0	3.7	1.7
11	1.7	3.5	1.8
12	2.1	3.3	1.2
13	2.2	3.5	1.3
14	2.2	3.5	1.3

Table 21

Students' Report of Time Spent Talking to Parents

	Control		ECES-ONLY			DMS		
	Pre	Post	Pre	Post-Pre	Post-Post	Pre	Post-Pre	Post-Post
N	64	61	87	78	79	105	101	100
Mean	2.0	2.2	2.0	2.0	2.3	2.3	2.2	2.4
Standard deviation	1.0	1.0	1.0	1.1	1.1	1.1	.9	1.2

Table 22

Students' Ratings of Importance of Planning on Item 14 of the CDMS Test

	Control		ECES-ONLY			DMS		
	Pre	Post	Pre	Post-Pre	Post-Post	Pre	Post-Pre	Post-Post
N	64	61	87	79	80	105	101	99
Mean	4.2	4.1	4.2	3.9	4.3	4.4	4.0	4.6
Standard Deviation	.9	.9	.9	.9	.8	.8	.9	.6

Table 23

Students' Reports of Making Better Use of Talks with Counselors and Parents After Using ECES

	ECES-ONLY	DMS
N	81	103
Mean	2.6	3.4
Standard Deviation	1.5	.6

Table 24

Number of Students in Pretest and Posttest Ranks on the CDMS Test

	DMS	ECES-ONLY	Control
Pretest Rank			
1	18	4	5
2	6	11	8
3	0	9	11
Posttest Rank			
1	23	1	1
2	1	20	6
3	0	3	17
Improvement	21	16	7
% Improvement	90	70	30

Table 25

CDI (Scale A). Pretest, Posttest and Adjusted Means and Standard Deviations for Three Intensive Study Groups, by Sex.

Treatment Group	Sex	Number	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Mean
DMS	Males	29	95.2	20.9	112.7	31.1	113.5
	Females	30	101.7	18.4	121.3	23.5	117.4
ECES-ONLY	Males	31	98.8	22.4	103.3	26.4	101.4
	Females	38	97.4	18.6	100.3	24.3	108.5
Control	Males	26	80.1	25.8	101.5	18.0	104.7
	Females	31	94.	20.1	101.4	21.9	106.3
	TOTAL	183	96.3	21.5	108.5	25.3	

Table 26

Two-Way Analysis of Covariance of CDI (Scale A) Pretest and Posttest Scores for Three Intensive Study Groups, by Sex.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	4410.4	2	2205.2	6.0*
Sex	245.0	1	245.0	0.7
Interaction	979.8	2	489.9	1.3
Mean	11327.6	1	11327.6	30.8*
Covariates	44189.9	1	44189.9	120.2*
Error	66570.3	181	367.7	

* $p < .01$

Table 27

CDI (Scale B) Pretest, Posttest, and Adjusted Means and Standard Deviations For Three Intensive Study Groups, by Sex.

Treatment Group	Sex	Number	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Mean
DMP	Males	29	238.3	37.3	272.8	46.7	273.5
	Females	30	253.5	59.2	288.1	53.9	279.1
ECAS-ONLY	Males	31	237.2	43.1	235.2	37.0	236.5
	Females	38	241.6	48.3	251.8	50.1	250.4
Control	Males	27	230.2	40.3	233.5	36.1	230.2
	Females	31	234.1	47.0	250.8	43.7	254.0
	TOTAL	188	239.3	46.7	255.4	53.2	

Table 28

Two-Way Analysis of Covariance of CDI (Scale B) Pretest and Posttest Scores for Three Intensive Study Groups, by Sex.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	39991.7	2	39991.7	11.6**
Sex	6115.8	1	6115.8	3.5*
Interaction	713.5	2	356.8	0.2
Mean	77168.6	1	77168.6	44.8*
Covariates	153097.8	1	153097.8	88.9*
Error	311478.3	181	1720.8	

* $p < .05$

** $p < .01$

Table 29

CDI (Scale C) Pretest, Posttest, and Adjusted Means and Standard Deviations for Three Intensive Study Groups, by Sex.

Treatment Group	Sex	Number	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Mean
DMS	Males	29	1722	5.2	18.6	6.0	18.6
	Females	30	18.1	3.7	19.6	4.5	19.2
ECES-ONLY	Males	31	17.5	4.8	17.0	6.0	16.7
	Females	38	17.9	4.2	17.7	5.7	17.4
Control	Males	26	14.2	7.4	16.8	6.2	18.4
	Females	34	18.0	3.9	17.3	5.2	17.0
	TOTAL	188	17.3	5.0	17.8	5.6	

Table 30

Two-Way Analysis of Covariance of CDI (Scale C) Pretest and Posttest Scores for Three Intensive Study Groups, by Sex

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	104.0	2	52.0	2.0
Sex	0.5	1	0.5	0.0
Interaction	38.1	2	19.1	0.7
Mean	1163.8	1	1163.8	45.3
Covariates	1132.4	1	1132.4	44.1
Error	4652.4	181	25.7	

Table 31

Last Year's Certainty of Vocational Choice as Reported Retrospectively by the Three Intensive Study Groups

Treatment Group	Response: Very Uncertain	Somewhat Uncertain	Somewhat Certain	Very Certain	Total
DMS	17 (30%)	20 (35%)	14 (25%)	6 (10%)	57 (100%)
ECES-ONLY	14 (22%)	19 (30%)	22 (34%)	9 (14%)	64 (100%)
Control	14 (24%)	20 (34%)	17 (29%)	8 (13%)	59 (100%)

$X^2 = 2.45$, n.s.

Table 32

Current Certainty of Vocational Choice Among the Three Intensive Study Groups

Treatment Group	Response: Very Uncertain	Somewhat Uncertain	Somewhat Certain	Very Certain	Total
DMS	5 (9%)	6 (11%)	21 (38%)	23 (42%)	55 (100%)
ECES-ONLY	8 (12%)	11 (17%)	32 (48%)	15 (23%)	66 (100%)
Control	5 (9%)	18 (31%)	28 (48%)	7 (12%)	58 (100%)

$X^2 = 17.8$, $p. < .01$

Table 33

Mean Ninth-Grade and Tenth-Grade Grade-Point Average for Three Intensive Study Groups.

Treatment Group	Number	Ninth-Grade Mean GPA	Tenth-Grade Mean GPA
DMS	42	2.7	2.7
ECES-ONLY	66	2.8	2.8
Control	54	2.4	2.4

Table 34

Number of Absences from School During Semester for Three Intensive Study Groups.

Treatment Group	Absentee Rate: Low (0 - 5 days)	High (6 or more days)	Total
DMS	27 (56%)	21 (44%)	48 (100%)
ECES-ONLY	44 (64%)	25 (36%)	69 (100%)
Control	16 (29%)	39 (71%)	55 (100%)

$X^2 = 15.6$, $p < .001$

TABLE 35

Educational and Career Exploration System

Student Questionnaire

During this school year, you have engaged in a number of activities which may have helped you think about your educational and vocational future.

This questionnaire is designed to find out what you have done and how much help you have received in your career planning.

Name: _____

School: _____

Sex: Male _____ Female _____

ECES/DMS/72

TABLE 35 (Continued)

DMS

1. Please indicate below how many times during this school year you engaged in the following.

1-3	4-6	7-9	10+	
14	29	13	-	Visits to the computer terminal to use the Educational and Career Exploration System (ECES).
41	14	2	-	
7	24	8	17	Individual conferences with your counselor about your educational and vocational plans.
				Group sessions about Decision Making and career planning.

Not Relevant

ECES ONLY

N.R.	0	1-3	4-5
3	9	35	11
3	22	29	4

2. How would you describe yourself now with relation to your career plans for the future?

DMS			ECES ONLY
2%	1.	I haven't thought much about my future plans.	3%
3	2.	I am really uncertain about my future plans.	12
32	3.	I am somewhat uncertain about my future plans.	34
49	4.	I am rather definite about my future plans.	40
15	5.	I am very definite about my future plans.	10

3. How were you last year at this time (i.e., at the end of 9th grade) in relation to your career plans for the future?

DMS			ECES ONLY
11%	1.	I hadn't thought much about my future plans.	12%
32	2.	I was really uncertain about my future plans.	28
40	3.	I was somewhat uncertain about my future plans.	40
11	4.	I was rather definite about my future plans.	17
5	5.	I was very definite about my future plans.	3

Note: The entries under Questions 2 and 3 are the per cents of the respondent groups checking the particular response.

N.R. means No Response.

TABLE 35 (Continued)

Please indicate below the extent to which you have been helped during the past year in various aspects of your career planning. Rate each of the sources of help using the following scale:

Sources of Help	Amount of Help
(ECES) ECES Terminal Visits	1. None at all.
(CO) Individual conference with counselor	2. Hardly any help.
(DMS) Group sessions on Decision Making	3. Some, but not much help.
	4. A considerable amount of help.
	5. A great deal of help.

To what extent has each of the sources:	DMS			ECES ONLY	
	ECES	CO	DMS	ECES	CO
4. been helpful to you in the area of educational planning?	71%	50%	33%	32%	30%
5. been helpful to you in the area of occupational planning?	70	39	30	44	24
6. helped you find definite paths of action in reaching your goals?	48	38	26	20	20
7. helped you understand how your strengths and weaknesses fit in with your educational goals?	61	39	27	38	24
8. helped you understand how your strengths and weaknesses fit in with your occupational goals?	63	44	36	40	17
9. helped you find new information about the world of work that helped you make decisions?	79	45	36	46	24
10. made you feel more aware of the possible educational alternatives you have?	70	55	25	40	22
11. made you feel more aware of the possible occupational alternatives you have?	72	52	23	56	22
12. helped you become aware of the important factors on which to base your educational decisions?	63	52	32	38	37
13. helped you become aware of the important factors on which to base your occupational decisions?	75	52	43	50	26
14. helped you make better educational decisions?	60	56	30	28	33
15. helped you make better occupational decisions?	70	54	36	40	24

Note: Entries above are per cents, based on number rating 4 or 5 divided by total who responded to these questions.

TABLE 35 (Continued)

16. About how many new occupations did you explore this year that you previously knew little or nothing about?

DMS		ECES ONLY
	1. None	
	2. 1 - 3	
63%	3. 4 - 6 4. 7 - 9 5. 10 or more	26%

17. About how many new majors did you explore this year that you previously knew little or nothing about?

	1. None	
	2. 1 - 3	
39%	3. 4 - 6 4. 7 - 9 5. 10 or more	19%

18. Do you feel that because of using ECES you can profit more from talks with your counselor?

	1. Definitely not	
	2. Probably not	
36%	3. Probably would 4. Definitely would	64%

19. About how many times did you talk with your counselor about your ECES printouts (charts)?

	1. Not at all	
	2. Once	
	3. Twice	
39%	4. 3 times 5. 4 or more times	5%

20. How often did you discuss the ECES system with your parents?

	1. Never	
	2. Once	
	3. Twice	
65%	4. 3 times 5. 4 or more times	40%

21. What was your parents' reaction to the ECES printouts (charts)?

	1. They didn't see any printouts	
	2. Definitely unfavorable	
	3. Generally unfavorable	
65%	4. Generally favorable 5. Definitely favorable	54%

TABLE 35 (Continued)

22. What is your overall reaction to the Educational and Career Exploration System as a whole, including the terminal visits, the group sessions, the assignments, and the counselor conferences?

DMS		ECES ONLY
6%	1. Of little value in my career planning	15%
23	2. Of some value in my career planning	44
37	3. Of considerable value in my career planning	23
34	4. Of great value in my career planning	19

TABLE 3

Educational and Career Exploration System

Questionnaire for Parents

During the past year at school your 10th grade student has had the chance to use the Educational and Career Exploration System (ECES). To help us evaluate the worth of ECES we are asking both you and your student to fill out the enclosed questionnaire and mail it back to us. Your answers are confidential and no one at your student's school will see them. Please be as frank as you can; we value your answers since we want to make ECES useful to both students and parents.

Our student is: male _____ female _____.

Our student's school is _____.

Our student's name is _____.

Please fill this out and mail it as soon as you can, along with the one which your son or daughter filled out. Please use the enclosed envelope addressed to:

ECES Evaluation Study
Box 164
Teachers College
Columbia University
New York, N.Y. 10027

ECES/DMS/72

TABLE 36 (Continued)

1. To what extent has your son or daughter discussed with you his or her use of ECES in exploring educational and career possibilities?

DMS		ECES ONLY
5%	1. Not at all.	14%
51	2. It was mentioned--but only briefly. 3. There has been some discussion--but not much.	65
44	4. There has been quite a lot of discussion at different times. 5. We discuss it regularly.	22 1. _____

2. Following are some of the activities which the ECES program involves. How much has your son or daughter talked about these with you?

DMS A. Occ.	Freq.		Not at all	ECES ONLY Occasionally	Frequently
54%	2%1.	Terminal visits on ECES	40	45	16
46	31 2.	Print-outs from ECES computer	43	41	16
57	20 3.	Individual conferences with counselors	47	43	10
53	23 4.	Reading about occupations	40	48	12
57	23 5.	Reading about schools to go to after high school	57	29	14
38	" 6.	Assignments as part of the Decision Making Sessions	Not Relevant		
47	" 7.	The group sessions on Decision Making	Not Relevant		

3. Do you feel that you have become more involved in your child's educational or vocational planning since his or her participation in the ECES program?

DMS		ECES ONLY
65%	1. Definitely have not. 2. Probably have not. 3. Probably have. 4. Definitely have.	43%

3. _____

TABLE 36 (Continued)

4. Read statements A through G below, then select 1 of the 5 possible answers that best indicates how much help you feel your son or daughter has received from the ECES program in each of the areas below:

1. None at all.
2. Hardly any help.
3. Some--but not much help.
4. A considerable amount of help.
5. A great deal of help.

		Per cent Checking 4 Or 5	
		DMS	ECES ONLY
A.	Seeing connections between his or her high school experience and future plans	A. 43%	29%
B.	Getting useful facts about the world of work	B. 53	33
C.	Seeing connections between his or her interests and possible occupations	C. 74	46
D.	Seeing connections between his or her abilities and possible occupations	D. 64	40
E.	Discovering new occupational possibilities he or she might look into	E. 48	35
F.	Discovering new educational possibilities he or she might look into	F. 54	23
G.	Making good decisions about what to do after high school	G. 52	27

5. Do you feel your son or daughter is better able to make decisions about his or her career as a result of participating in the ECES program?

	DMS	ECES ONLY	
1. Definitely is not.			
2. Probably is not.			
3. Probably is.	81%	59%	5.
4. Definitely is.			

6. Read statements A through F below, then select 1 of the 5 possible answers that best indicates how active you have been in each of the areas below:

1. Not active at all.
2. Not very active.
3. Fairly active.
4. Very active.
5. Extremely active.

		Per cent Checking 3, 4 or 5	
		DMS	ECES ONLY
A.	Helping your son or daughter find summer employment that related to career goals	A. 24%	29%
B.	Meeting with a school guidance counselor to discuss your son's or daughter's situation and plans	B. 12	10
C.	Making sure that your son or daughter was meeting with the counselor	C. 56	31
D.	Encouraging your son or daughter to talk with individuals employed in careers he or she is considering	D. 53	49
E.	Obtaining books, pamphlets, or other educational and occupational information to assist your son or daughter to decide on future plans	E. 41	47
F.	Obtaining private vocational testing and counseling for your son or daughter	F. 7	2

TABLE 3 (Continued)

7. How far do you plan for your child to go in school?

	DMS	ECES ONLY
Less than high school diploma or equivalent	-	-
High school diploma or equivalent	~~10~~	~~21~~
~~Post-high school training other than Jr. college~~ Jr. college graduation	~~30~~	~~38~~
~~College graduation~~ Graduate school	~~60~~	41

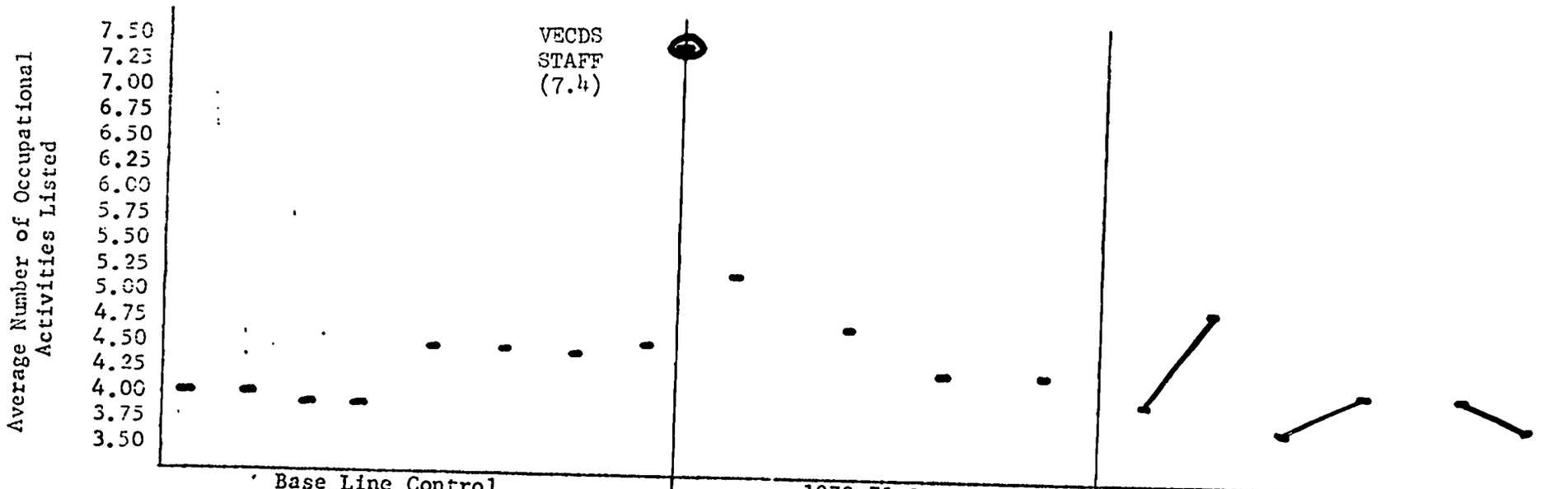
8. How far did you go in school?

	DMS		ECES ONLY	
	Father	Mother	Fa.	Mo.
Less than high school diploma or equivalent	~~50~~	~~62~~	69	72
High school diploma or equivalent				
~~Post-high school training other than Jr. college~~ Jr. college graduate	~~26~~	~~23~~	14	16
~~College graduate~~ Graduate school	~~24~~	~~15~~	17	12

9. What are your occupations?

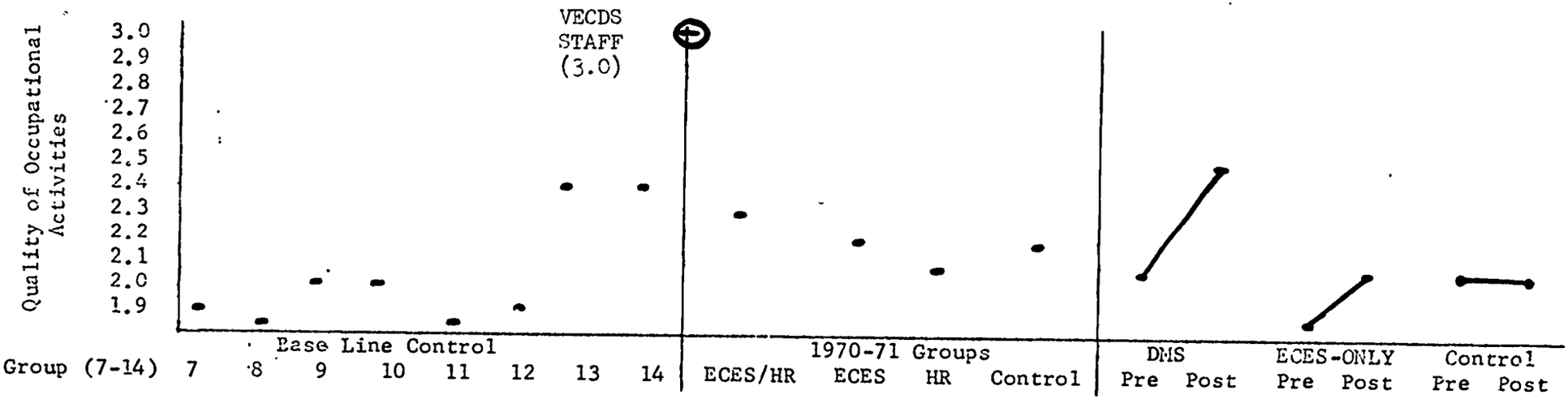
	Current or Usual Job Title (e.g., engineer, carpenter, filling station attendant)	Type of Employer (e.g., factory, bank, garage)	Currently Unemployed
Father (Male Guardian)	_____	_____	_____
Mother (Female Guardian)	_____	_____	_____

Figure 2. Average Number of Occupational Activities Listed



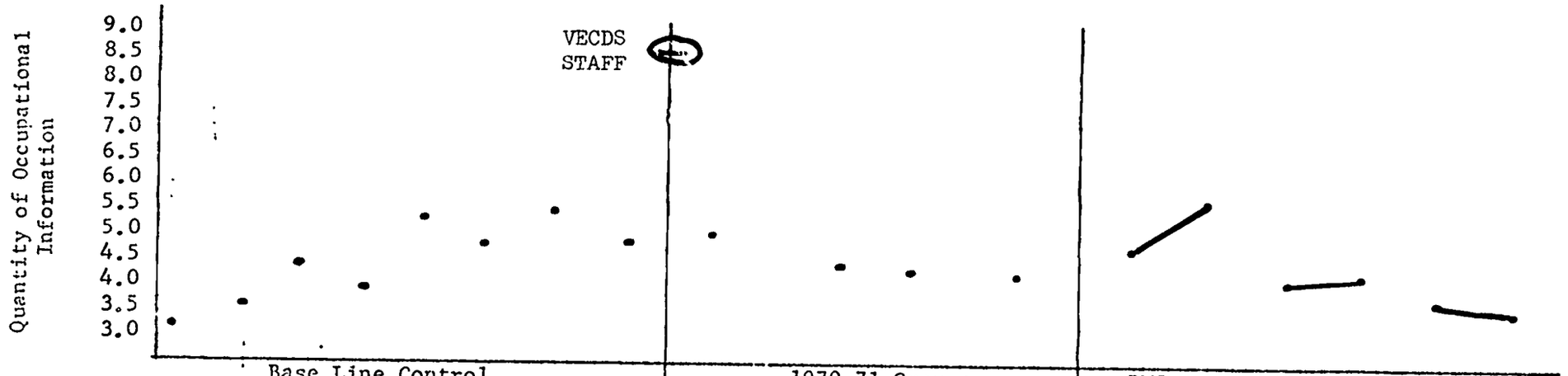
Group	(7-14)	Base Line Control 7	8	9	10	11	12	13	14	1970-71 Groups ECES/HR	ECES	HR	Control	DMS Pre	DMS Post	ECES-ONLY Pre	ECES-ONLY Post	Control Pre	Control Post
N	663	89	105	100	177	25	76	39	52	52	97	75	112	99	102	79	79	61	60
Mean	4.1	4.1	4.1	3.9	3.9	4.5	4.5	4.4	4.6	5.2	4.7	4.3	4.3	4.1	5.0	3.7	4.2	4.2	3.9
S.D.	2.2	2.1	2.0	2.4	1.9	2.6	2.8	2.4	2.5	2.9	2.4	2.2	2.2	1.9	1.8	1.8	2.2	1.6	1.8

Figure 2. The Quality of Occupational Activities Listed



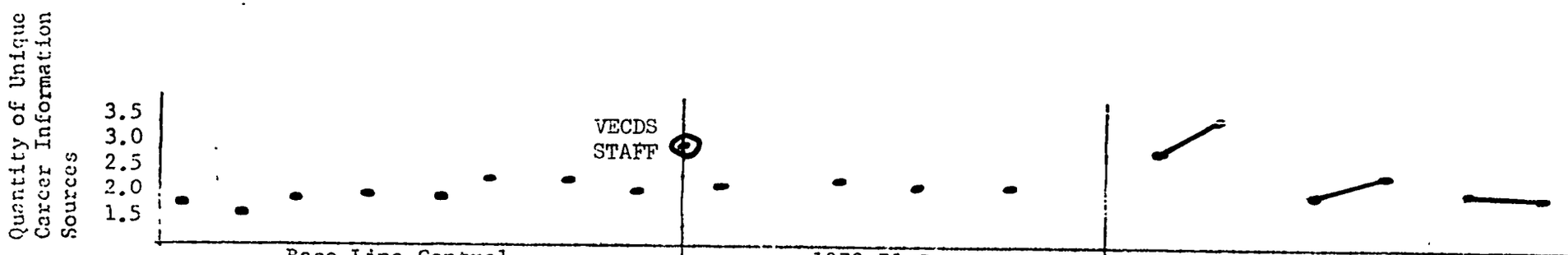
Group	(7-14)	Base Line Control 7	8	9	10	11	12	13	14	1970-71 Groups ECES/HR	ECES	HR	Control	DMS Pre	DMS Post	ECES-ONLY Pre	ECES-ONLY Post	Control Pre	Control Post
N	663	89	105	100	177	25	76	39	52	52	97	75	112	99	102	79	79	61	60
Mean	2.0	1.9	1.8	2.0	2.0	1.8	1.9	2.4	2.4	2.3	2.2	2.1	2.2	2.1	2.5	1.9	2.1	2.1	2.1
S.D.	.7	.7	.7	.8	.6	.6	.6	.5	.5	.7	.6	.6	.6	.5	.6	.6	.5	.6	.6

Figure 3. The Quantity of Specific Kinds of Occupational Information Necessary for Decision Making



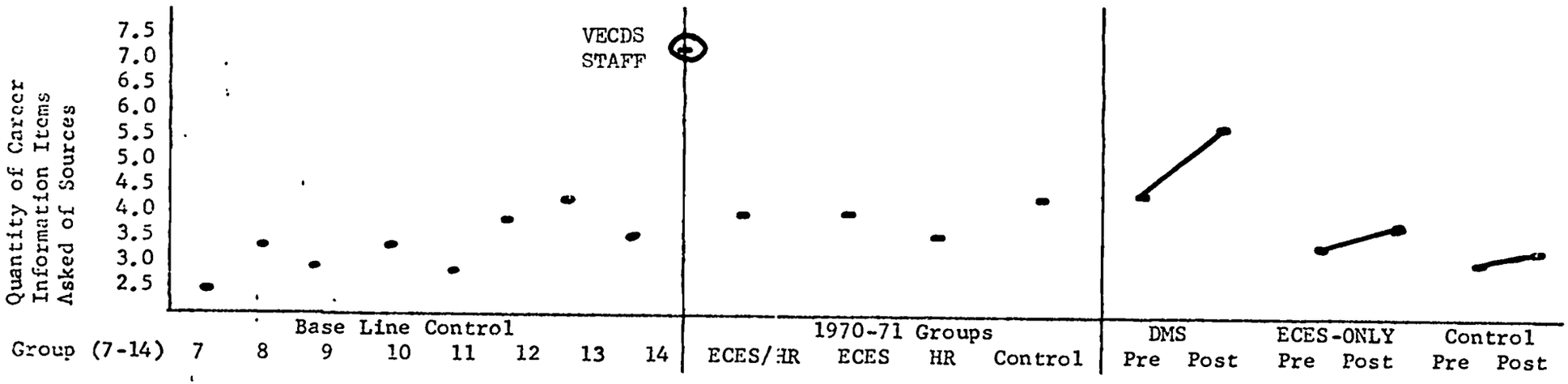
Group	(7-14)	Base Line Control 7	8	9	10	11	12	13	14	1970-71 Groups ECES/HR	ECES	HR	Control	DMS Pre	DMS Post	ECES-ONLY Pre	ECES-ONLY Post	Control Pre	Control Post
N	700	94	108	105	180	24	83	43	63	58	103	78	114	103	104	89	82	62	61
Mean	4.1	3.2	3.6	4.4	3.8	5.2	4.7	5.4	4.8	5.1	4.5	4.4	4.4	4.7	5.6	4.1	4.3	4.0	3.9
S.D.	2.0	1.5	1.9	2.1	1.8	2.9	2.0	2.2	2.3	2.2	2.0	1.8	2.0	2.3	2.2	2.1	2.1	1.9	1.4

Figure 4. Quantity of Unique Career Information Sources



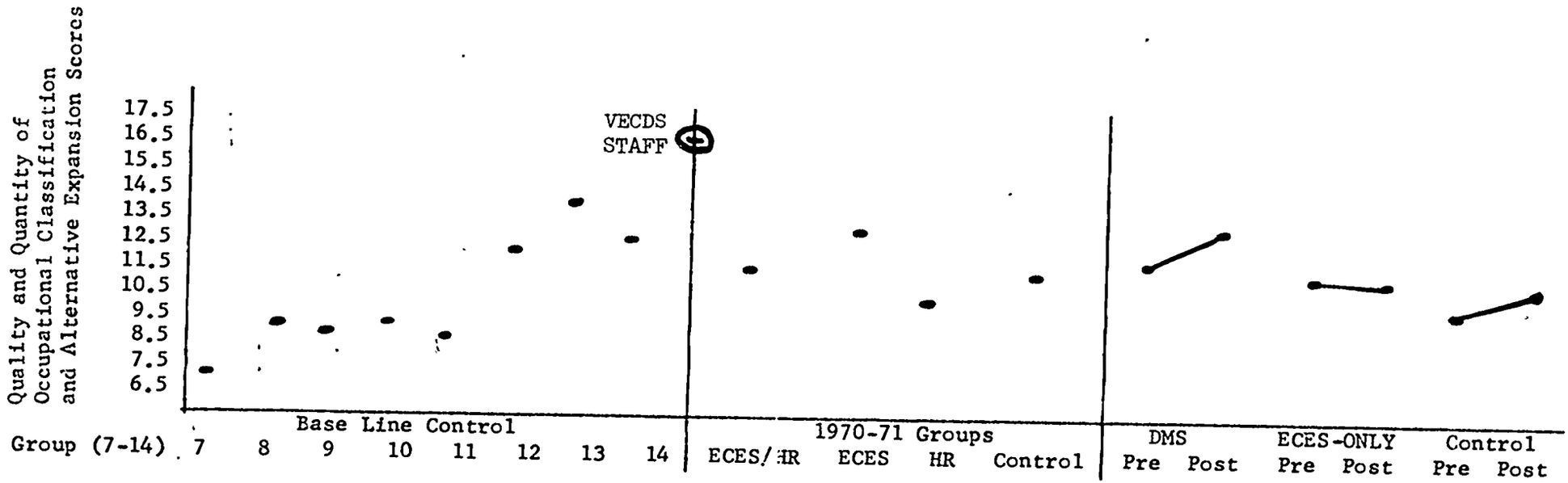
		Base Line Control								1970-71 Groups				DMS		ECES-ONLY		Control	
Group	(7-14)	7	8	9	10	11	12	13	14	ECES/HR	ECES	HR	Control	Pre	Post	Pre	Post	Pre	Post
N	522	69	73	75	132	20	68	37	48	48	85	56	88	92	95	76	69	49	48
Mean	2.0	1.8	1.6	2.0	2.1	2.0	2.4	2.4	2.2	2.4	2.5	2.4	2.4	2.6	3.4	2.2	2.5	2.0	1.9
S.D.	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.2	.9	1.1	1.2	1.1	1.2	1.1	1.3	1.1	1.1	1.0	1.0

Figure 5. Quantity of Career Information Items Asked of Sources



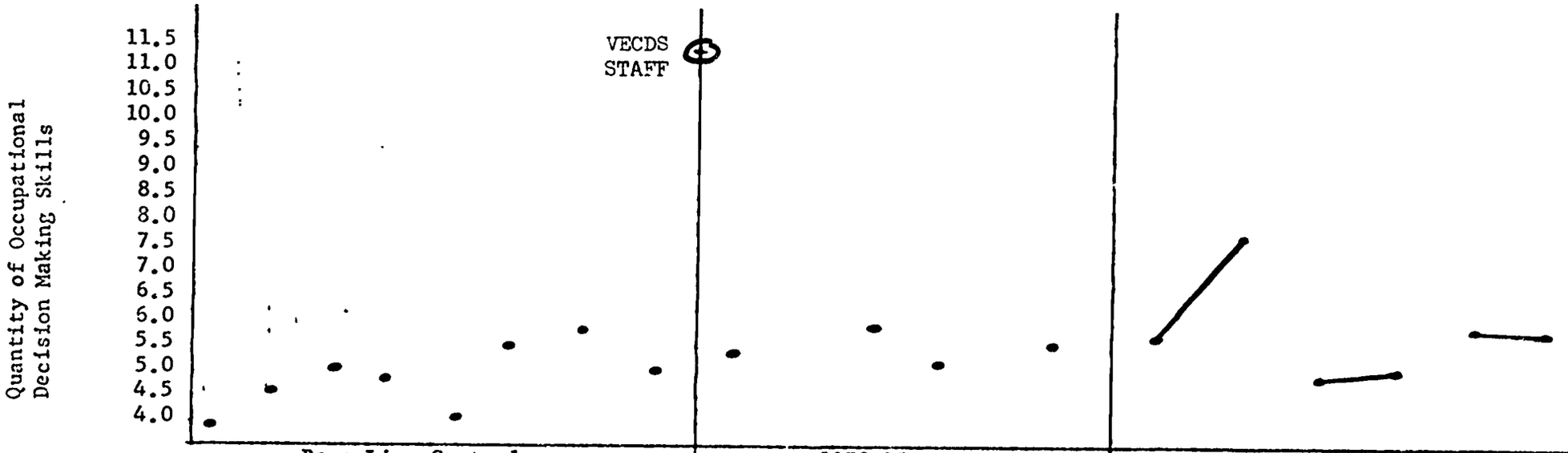
Group	(7-14)	Base Line Control 7	8	9	10	11	12	13	14	1970-71 Groups ECES/HR	ECES	HR	Control	DMS Pre	DMS Post	ECES-ONLY Pre	ECES-ONLY Post	Control Pre	Control Post
N	480	53	62	71	127	19	66	36	46	47	81	53	84	89	92	74	67	46	45
Mean	3.3	2.5	3.3	2.9	3.2	2.8	4.0	4.2	3.5	3.7	3.7	3.5	4.2	4.2	5.7	3.2	3.9	3.1	3.4
S.D.	2.3	1.4	2.7	2.1	2.1	1.6	2.7	2.8	1.7	2.1	2.5	2.0	2.6	2.4	3.6	2.6	2.3	1.7	3.2

Figure 6. Quality of Occupational Classification and Quantity of Occupational Alternatives



Group	Base Line Control (7-14)	7	8	9	10	11	12	13	14	1970-71 Groups ECES/HR	ECES	HR	Control	DMS Pre	DMS Post	ECES-ONLY Pre	ECES-ONLY Post	Control Pre	Control Post
N	710	100	114	111	179	21	83	43	59	59	103	78	108	106	102	86	84	65	61
Mean	9.8	6.8	9.1	8.7	9.3	8.9	12.3	14.2	12.8	11.9	13.3	10.1	11.1	11.9	13.3	11.3	11.2	10.1	10.9
S.D.	5.2	3.9	4.8	3.9	4.5	3.5	5.8	6.2	6.5	4.5	4.5	4.5	4.7	4.6	5.5	4.4	5.4	4.2	4.8

Figure 7. Quantity of Occupational Decision Making Skills



Group	(Total)	Base Line Control								1970-71 Groups				DMS		ECES-ONLY		Control	
		7	8	9	10	11	12	13	14	ECES/HR	ECES	HR	Control	Pre	Post	Pre	Post	Pre	Post
N	680	87	103	109	171	23	84	44	59	54	103	80	114	103	103	86	85	65	59
Mean	4.9	3.9	4.6	5.1	4.8	4.2	5.5	5.9	5.2	5.5	6.0	5.3	5.7	5.8	7.8	5.1	5.2	5.6	5.5
S.D.	2.5	2.3	2.3	2.3	2.3	2.7	2.8	3.3	2.2	2.3	2.7	3.0	2.8	2.2	8.3	2.1	2.5	2.8	2.1

APPENDIX

CAREER DECISION MAKING SKILLS TEST
GENESEE INTERMEDIATE SCHOOL DISTRICT
Office of Vocational Education
2413 West Maple Avenue
Flint, Michigan 48507

NAME_____

SCHOOL_____

Sex: M F (Circle One) Age_____ Grade_____

Your Counselor's Name_____

Have you used ECES? No Yes (Circle One)

If yes, how many hours?_____

How would you describe your plans for after high school?

Circle One Number	
1	I am undecided at this time.
2	I am going to get a job right after high school.
3	I am going to get about one year of training and then get a job.
4	I am going to a two-year vocational-technical school and then get a job.
5	I am going to a two-year junior college and then get a job.
6	I am going to a two-year junior college and then transfer to a four-year college.
7	I am going to a four-year college.

Item # 1. What occupation, or job, do you think you will take to earn your living after you finish your schooling? Pick the job that seems most likely to you at this time. Write the name of that job below.

_____

Item # 2. Write down as many of the important things as you can that you would be expected to do on that job. (Be specific.)

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Item # 3. One reason people select an occupation is because they want to share common interests with other people in these occupations. Of the interests listed below, which one do you feel is the most important interest shared by the people in the occupation you chose in Item #1.

Circle One
Number

1. Service: providing service to people.

2. Business Contact: working with people in a business situation.

3. Business Organization: planning and leading a business situation.

4. Technology: working with equipment and machines to solve problems.

5. Outdoor: working outdoors.

6. Science: working with ideas and information to explore and solve problems.

7. General Culture: working to understand and relate the knowledge about people.

8. Arts, Entertainment and Recreation: working to provide recreation for people.

Item # 4. How much education or training will you need to prepare yourself to enter the job you chose in Item #1?

Circle One Number

1 High School Diploma.

2 Apprenticeship or Technical Training up to 6 months.

3 Apprenticeship or Technical Training up to 1 year.

4 1-2 years Technical or Vocational School.

5 2 years Junior College or Vocational School.

6 4 years College.

7 More than 4 years of College.

Item # 5. Write the specific major areas of study, or major areas of training that you could take to prepare for the job you chose in Item #1.

1.

2.

3.

4.

5.

Item # 6. Write the specific high school courses that <u>you must take to prepare you to enter the level</u> of schooling or training you selected in Item #4.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Item # 7. Write down the names of any other occupations or jobs at which you are thinking about earning your living after you finish school.

Item # 8. When you ask for information about jobs, you ask for very specific kinds of information. Then you use this information to decide whether or not you like the job. One kind of information you might ask for is <u>how much money</u> the job pays. <u>Write down as many other kinds of specific information you feel are important to know before deciding about a job</u>.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

Item # 9. This item has two parts. When you have a question about your future school or occupational plans, you look for information to help you answer the question or solve any problems you might have.

<u>First</u>, list the different sources of information you would use.

<u>Second</u>, describe the <u>general</u> kinds of information you would want to know from each source.

<u>Source of Information</u>	<u>Things you would want to know from each source</u>
1.	1.

2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Item #10. This item has six steps. Look at the four occupations listed below. They can be arranged in many different ways to show you they are different from each other.

Doctor
Electrical Engineer
Beautician
Heavy Machine Operator

Step 1 Arrange these occupations into two groups:

GROUP I	GROUP II
A._____	A._____
B._____	B._____

Step 2. Tell why you grouped them as you did.

GROUP I._____

_____

GROUP II._____

_____

Step 3 In GROUP I, tell how A is different from B.

A._____

_____

B._____

_____

Step 4 In GROUP II, tell how A is different from B.

A._____

_____

B._____

_____

Step 5 Add one occupation to each group that is similar to the occupation in that group.

For GROUP IA, add_____

For GROUP IB, add_____

For GROUP IIA, add_____

For GROUP IIB, add_____

Item #11. Suppose that you were trying to decide whether you wanted to be a reporter or a salesperson.

Suppose that you could only use the following information to make your decision:

A reporter earns $8,000 per year, must have at least 2 years of college education, and must work under the close direction of his editor.

A salesman (or saleswoman) can earn up to $15,000 per year, needs only six months of special training beyond high school, and is often free to determine his own daily working patterns.

Name the occupation you would choose._____

In the space below, show the steps you took in making your choice.

Use numbers to indicate how much more favorable the occupation you chose was over the one you didn't choose.

Item #12. The purpose of this item is for you to indicate how well prepared you feel you are to make your career planning decision.

To make a good career planning decision, you should:

1. Know all the important FACTS of information about the decision.
2. Understand what your PERSONAL requirements are for all the different parts of your decision.
3. Understand how well your personal requirements RELATE to the facts about all aspects of the decision.

Use the following scale to indicate how well prepared you feel you are in each area listed below.

5 I feel very well prepared to make this decision.

4 I feel well prepared to make this decision.

3 I feel fairly well prepared to make this decision.

2 I feel poorly prepared to make this decision.

1 I feel very poorly prepared to make this decision.

AREA	YOUR RATING (Circle Your Rating For Each Area)
1. Making a decision about what high school program I should take.	5 4 3 2 1

2.	Making a decision about which high school courses will best prepare me for the occupations I am considering.	5	4	3	2	1
3.	Making a decision about what kind of post high school education or training will best prepare me for the occupations I am considering.	5	4	3	2	1
4.	Making a decision about which schools I should go to after high school to prepare me for the types of training or education I need.	5	4	3	2	1
5.	Making a decision about what occupations or jobs I am planning to earn my living at after I finish my schooling.	5	4	3	2	1
6.	Making a decision about how to fit all my career plans together into a well organized plan for my future.	5	4	3	2	1
7.	Making a decision about what different sources of information I should use to get the information I need for my career planning.	5	4	3	2	1
8.	Making a decision about what specific kinds of information these sources of information have to offer me to help me with my career planning.	5	4	3	2	1
9.	Making a decision about how well a new occupation is suited to my personal requirements.	5	4	3	2	1
10.	Making a decision about how to identify what occupational alternatives are available to me.	5	4	3	2	1
11.	Making a decision about what facts are important to me in choosing among my occupational alternatives.	5	4	3	2	1
12.	Making a decision about what facts are important to me when choosing among my educational alternatives.	5	4	3	2	1
13.	Making a decision about how to combine my reasons and my values to make a logical career decision.	5	4	3	2	1
14.	Making a decision about how to combine my reasons and my values to make a logical personal decision.	5	4	3	2	1

Item #13. During a typical week, about how much time do you spend talking with your parents about your career plans?

Circle One Number

1	No time at all.
2	Less than 1 hour.
3	About 1 or 2 hours.
4	About 3 or 4 hours.
5	More than 4 hours.

Item #14. At this point in your life, how important is it to you to be planning and preparing for your future career?

Circle One Number

5	Very Important
4	Important
3	Fairly Important
2	Not Too Important
1	Unimportant

COUNSELOR REACTION QUESTIONNAIRE

NAME:_____ GROUP: DMS_____
ECESonly_____

PLEASE RESPOND TO THE FOLLOWING STATEMENTS BY CIRCLING THE LETTERS THAT BEST DESCRIBE YOUR REACTION:

SA	A	D	SD	X
Strongly agree	agree	disagree	strongly disagree	does not apply

Note: The abbreviation ECES/DMS refers either to ECES alone or to the combination of terminal and group sessions, depending upon which experience your students had.

	Extent of agreement
1. Students know a lot more about themselves after using ECES/DMS.	SA A D SD X
2. Students have more occupational and educational information after using ECES/DMS.	SA A D SD X
3. ECES/DMS gives the students a frame of reference that helps them think about their futures	SA A D SD X
4. ECES/DMS generates interest in thinking about occupations.	SA A D SD X
5. Students' anxieties about occupational choice are greatly reduced by ECES/DMS	SA A D SD X
6. Some of the ECES charts tend to discourage students unduly	SA A D SD X
7. ECES/DMS leads students to premature closure on their vocational plans	SA A D SD X
8. ECES/DMS is appropriate for the special needs of the students at our school.	SA A D SD X
9. ECES/DMS should be available to:	
9th graders	SA A D SD X
10th graders	SA A D SD X
11th graders	SA A D SD X
12th graders	SA A D SD X
10. The following components of the system were very valuable for the students:	
1. V.P.I.(Vocational Planning Inventory)	SA A D SD X
2. O.V.I.S.(Ohio Voc. Interest Survey)	SA A D SD X
3. ECES Search Strategies	SA A D SD X
4. ECES Charts	SA A D SD X
5. Individual counseling sessions	SA A D SD X
6. DMS Group session	SA A D SD X
7. DMS student assignments	SA A D SD X
11. The extra work created by ECES/DMS is justified by the effects on students	SA A D SD X
12. The existence of ECES/DMS has led me to do some research on the users.	SA A D SD X.
13. My work with students is at a much higher level because of ECES/DMS	SA A D SD X

14. The presence of ECES/DMS has cause me to do some reading I would not have otherwise done.	SA	A	D	SD	X
15. Because of ECES/DMS I have had to neglect some students I used to serve better .	SA	A	D	SD	X
16. ECES/DMS has caused me to see types of students I did not previously see.	SA	A	D	SD	X
17. I have been well provided with information I needed to have in order to help my students with ECES.	SA	A	D	SD	X
18. I feel that I have been an important participant in the ECES/DMS field trial.	SA	A	D	SD	X