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ABSTRACT

The development of individualized educational programs (IEPs) has become a burden for many secondary school systems. The primary objective of the project described in this report was to develop a computer system that would help in the development of IEPs for all 15,000 handicapped and/or disadvantaged students enrolled in Pennsylvania's vocational programs. Collection of tests and their criteria used in IEP development was the method used to obtain data, using a 10% sampling of school districts. The Singer Vocational Evaluative System and the Vocational Interest Assessment Survey were incorporated in the program. Information was put in the proper computer syntax, and logic sequence models for data usage were constructed. The instrument was tested using data appropriate for handicapped students enrolled in the programs. The system performs the following operations: (1) locates discrepancies and results of intelligence quotient (IQ) tests; (2) classifies the IQ score; (3) compares achievement and IQ standardized results; (4) classifies isolated IQ results into educational terms; and (5) offers some guidelines related to a student's probable academic abilities. The following factors may affect the results offered by the program: physical limitations of the student; basing decision on aptitude or interest results as isolated test scores; and evaluator errors--these may be eliminated by reviewing test procedures. (Five appendices forming the bulk of the document are: (1) list of professional contacts and organizations; (2) sampling of special needs students' assessment instruments; (3) users' guide--IEP assessment aid; (4) sample computer assessment output; and (5) computer programmed information.) (NLA)

ED337709

FINAL REPORT

Development and Testing of an Expert System to Assist in Evaluating Handicapped Vocational Students for IEPs

(PDE Project Contract # 94-8006)

submitted by

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submitted to

The Bureau of Adult and Vocational Education
The Pennsylvania Department of Education
Harrisburg, Pennsylvania

October 1988

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Development and Testing of an Expert System to Assist in Evaluating Handicapped Vocational Students for IEPs

INTRODUCTION

"Mainstreaming" and "normalization" are terms frequently used throughout our educational system. They refer to program planning and implementation for the special needs student.

Frequently, special needs students are placed in a mainstream classroom in order to meet normalization criteria. Mainstream placement occurs to achieve the most appropriate and least restrictive educational environment. Unfortunately, the mainstream classroom teacher is often inadequately prepared to meet the educational requirements of the special needs student. Learning how to identify, appropriately assess and program for the student requires additional time and training, not often provided the normal classroom teacher.

In the high school setting in particular, guidance counselors are often busy attempting to assist the college bound student with placement ideas. School psychologists, who often have adequate training and background information related to the special needs student, spend hours attempting to appropriately assess students and interpret their standardized test results to determine appropriate student placement within the system. Because of these factors, both of these resources become unavailable to assist the classroom teacher with development of an appropriate educational strategy, tailored to meet the needs of the special needs student.

Breakdowns in educational background and support services for the classroom teacher often result in the development of a meaningless court mandated individualized educational program (IEP) for the student. Plans are often developed purely to meet regulations, but offer no true meaning related to the student's progress and educational needs.

RATIONAL

The development of individualized educational programs has become a real burden and task for many secondary school systems. Such special care and consideration for our special needs population was mandated by law many years ago. The impact of this federal legislation is being felt in all grade levels. Prior to the passage of legislation dealing with the education of the handicapped, school officials had little trouble working with the "regular" students. IEP teams did not exist and therefore no man-hours were required. With the passage of Public Law 94-142, The Education of All Children Act (1975), special care had to be taken in providing services to this population. Specifically, P.L. 94-142 required that an IEP be developed for each and every handicapped student and that these individuals will be educated in a *least restrictive environment.*

With the passage of The Carl D. Perkins Act of 1984, the requirements of an IEP for all handicapped students was reiterated. Additionally, this new act required that IEPs be completed for disadvantaged students as necessary. It is not uncommon to find schools where the process of writing IEPs takes the entire year. *School officials, especially those concerned with IEP development, are swamped with meetings and paperwork dealing with developing appropriate and effective IEPs for handicapped students.*

Conversations with school officials throughout the Commonwealth have revealed complaints about the time consuming task of writing IEPs. This was especially true in the Philadelphia area. There, school officials indicated that the process of writing appropriate IEPs is a year-round activity. Officials in the Harrisburg area had similar kinds of comments. In the 1985-86 academic school year, there were more than 15,840[1] handicapped students in vocational programs alone that required IEPs. Another 1,952

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1 1985-86 Vocational Education Management Information System, Pennsylvania Department of Education.

handicapped students were enrolled in specially funded programs. Governor Casey[2] stated that "we must be certain that our schools meet these students' needs or we will doom many our young people to lives of limited opportunity"(p. 27).

Using an Expert System

An Expert system is a method of using the expertise of professionals to solve problems, similar to how we use consultants. Expert systems go a step further by adding the knowledge of experts to a computer system and utilizing that knowledge in the same way as the expert does. Thus, it is possible to use this knowledge and make the same decisions as if the one were conversing with the consulting expert. J. R. Quinlan[3] (1986) stated that the technology of building knowledge-based systems by inductive inference from examples has been demonstrated successfully in several practical applications. Expert system has been very effective in climatology especially in the hurricane season to predict hurricane incidents. Quinlan advocates more extensive use of this technology in other areas as well. Expert system and artificial intelligence are sometimes used interchangeably. Machines that think or machines who think have been a topic of reflection and debate according to Kurzweil (1985). However, artificial intelligence differs in that expert system uses a knowledge based from which conclusions are made and does not generate or attempt to generate new information as does the former. ***Rulemaster***[4] provides the most appropriate shell for the development of an expert system in education. It is easily used and is available on the Cooperative Extension Computer Network.

OBJECTIVES

The primary objective of this project was to develop an computer system that would aid in the development of IEPs for handicapped and/or disadvantaged students. This

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2 You've Got a Future in Casey--The Casey-Singel Education Plan for Pennsylvania, 1986.
3 J. R. Quinlan. Centre for Advanced Computing Science, New South Wales Institute of Technology, Sydney, Australia
4 Radian Corporation, Austin Texas

computer system used the same information, clues, and patterns used by experts in the field. It is anticipated that this system would benefit all (15,000) handicapped students enrolled in vocational programs in the Commonwealth.

PROCEDURES

A. An advisory committee was be established to provide guidance for this project. The committee was composed of persons responsible for IEP development throughout the Commonwealth and special efforts was made to include at least one representative from a large urban area. This committee met approximate five times through the span of this project. The committee met every two months starting August 1987.

An advisory committee was established to help determine the most appropriate assessment tools to be incorporated into this system, and to monitor the ongoing progress of this project. The committee members, who met throughout the development of this system, include Dr. John Salvia, Professor of Special Education, Mr. William Moore, Program Coordinator, IU#8, Ms. Colleen Heally, Psychologist, Mrs. Janet Scanlon, Teacher and Parent Advocate, and Ms. Kathleen Banski, Project Assistant.

The advisory committee adopted the following objectives:

1. To identify those students whose standardized achievement and intelligence scores vary markedly from the norm.

2. To identify those students whose standardized achievement and intelligence scores vary markedly based on that particular student's results.

3. To offer general suggestions related to further assessment and programming for the student, based on standardized scores and academic programming.

4. To identify those areas of a student's vocational aptitude and interest survey results are most similar.

B. Collection of tests and their criteria used in IEP development. A 10% sampling of school districts throughout the Commonwealth will be accomplished to obtain this data. This data was summarized and then evaluated by the advisory committee. A graduate assistantship was gather this materials under the direction of the project director.

In conjunction with advisory committee members' input, a 10% sampling of school districts (See Appendix A for more details.) throughout the Commonwealth revealed that the WRAT (Wide Range Achievement Test) and the WISC or WISC-R(Wechsler Intelligence Scale for Children/Revised) are the most frequently utilized screening instruments for determining students' general achievement and intelligence abilities (See Appendix B for other assessment instruments being used). This system utilizes both of these instruments. Sampling procedures also revealed that assessment tools utilized to determine students' vocational interest and aptitude abilities vary markedly.

Vocational evaluators often employ non-formal assessment procedures. In addition, formal vocational assessment tools are infrequently normed for special populations. Program plans which couple students' vocational interest with their aptitude results are considered the most appropriate educational strategy to employ when attempting to guide students towards reaching their vocational potential. In addition, research indicates that vocational evaluative tools which utilize work sample procedures appear most effective in determining students' vocational abilities. For these reasons, this project has incorporated the use of the Singer Vocational Evaluative System and the Vocational Interest Assessment Survey into its program.

The Singer Vocational Evaluative System (VES)

The VES is composed of a series of job samples that are individually complete. There is not a prescribed sequence of administration, nor is it necessary to complete a specific number of jobs. Selection of the most appropriate set of job samples to be administered should be based on the individual needs of the participant, availability of jobs and/or training, and time available for occupational work sampling. The job samples may be administered in any order, although it is suggested that job samples related to an individual's vocational interests be employed first. Administration time varies, but generally requires 2-21/2 hours per sample. All forms, equipment and materials are

furnished within the VES. The VES includes an audiovisual format to ensure a standardized presentation of job samples. Job samples may be repeated by the subject. Repetition may be advantageous when the subject expresses a desire to attempt to improve his or her performance. Repetition may also permit an evaluator to measure learning while concomitantly demonstrating to a subject that he or she can learn new skills. The evaluator should become familiar with the contents of the VES manual and should complete the job sample, prior to administering the VES, regardless of the skills the evaluator may possess related to the job sample area.

Vocational Interest Assessment Survey (VIAS)

The VIAS is a unique interest assessment devise. The inventory utilizes an audio-visual format instead of verbal statements and emphasizes affective cognitive as opposed to verbal processes; it is designed primarily to tap affective responses.

The purpose of the VIAS is to help an individual identify areas of potential occupational exploration and training based on the participant's responses to work scenes. The VIAS attempts to breakdown career stereotyping and is particularly useful when used by individuals with academic difficulties. It eliminates the need for any special reading skills. This is beneficial for use, not only with populations such as the handicapped or academically disadvantaged, but also those whose native language is not English.

Occupations presented pictorially in the VIAS help to minimize the effect of verbal stereotyping. The VIAS is directed towards those individuals whose career decisions are likely to involve occupational training and attempts to minimize jobs which would require advanced academic skills and training. The occupational clusters presented by the survey represent careers which training is generally available in most communities. Career clusters are broad, but are composed of many related occupations.

C. Collection of clues and cues that experts in IEP development used in making decision about handicapped or disadvantaged students relative to educational planning.

This information was be put in the proper syntax for entering into the computer. The project director with the assistance of the graduate assistant accomplished this procedure.

INTERPRETATION OF RESULTS

A discrepancy of ±15 points in any tested area, indicated the need for further review of students' test scores and evaluative procedures. Discrepancies may be attributed to student performance or an error made by the evaluator at the time of testing.

A discrepancy of ±30 points in any tested area indicates the need for further review of scores and testing procedures. ±30 points indicates a significant student deviation from standardized test norms. Therefore a more thorough and specific evaluation of a student's abilities is warranted.

It is suggested that the vocational evaluator review the graph information presented by the system. It is recommended that the evaluator further pursue either assessment or programming procedures in those areas represented by the graph, which projects a students results to be most similar. For example, a student who demonstrates a score of 100% interest in the area of :

INTEREST RESULTS	APTITUDE RESULTS	ASSESSMENT AREA
100%	80%	Agriculture*
100%	60%	Metal
50%	80%	Cosmetology
80%	80%	Food Services*

A student who demonstrates a score of 100% interest result, with an 80% aptitude result in Agriculture* might benefit from programming and training related to this career area, as opposed to a Metal area where the aptitude result suggests a larger discrepancy from the interest result.

A student who demonstrates a score of 80% aptitude result, with an 80% interest result in Food Services* might benefit from programming and training related to this career area, as opposed to a Cosmetology area where the interest result suggest a larger discrepancy from the aptitude result.

D. Construction of logic sequence (deductive and inductive models) for data usage via the computer. The Rulemaster program required a special sequence of data entry in order for the expert system to arrive at appropriate outcomes. The advisory committee decided against the use of Rulemaster because of its lack of availability to schools and IEP teams. The committee suggested that a more practical method be used and recommended the electronic spreadsheet.

Initially, the project intended to use an expert system titled Rulemaster. However, per the advisory committees' recommendations, a system which would be less cumbersome to use was chosen. This program works via the Apple Macintosh's EXCEL program and can be loaded into an IBM personal computer using Lotus 1-2-3.

E. Testing the expert system utilizing real data appropriate for handicapped students enrolled in vocational programs. The output from this procedure was reviewed by the advisory committee to ascertain the appropriateness and accuracy of the output.

OUTPUT DESCRIPTIONS

Achievement Results

The system will automatically convert raw score information to a standard score equivalent. Recommendations of WRAT results are based on sub-tests standardized score comparisons. The system will locate discrepancies and results will be indicated based on the following:

±15 points between Spelling or Reading or Math sub-test scores indicates the need for further review of sub-test results and procedures. Further student assessment in the specified sub-test areas may be required. A curriculum which incorporates individualized educational programming may be beneficial.

±30 points between Spelling or Reading or Math sub-test scores indicates a marked discrepancy in student performance. A review of sub-test results and procedures is necessary. Further student assessment in the specified sub-test areas may be

required. A curriculum which incorporates individualized educational programming is indicated.

Intelligence Results

The system performs three operations related to IQ testing results. These are:

1. The system classifies the IQ score, in isolation, based on standardized interpretations:

SCORE RANGES	CLASSIFICATION
130 and up	Very Superior
120-129	Superior
110-119	High Average
90-109	Average
80-89	Low Average
70-79	Borderline
60 and below	Deficient

2. The system compares achievement and IQ standardized results. The system identifies discrepancies and results are indicated based on the following:

±15 points between any sub-test and IQ score indicates the need to review sub-test results and IQ testing procedures. Further student evaluation may be required. Individualized educational programming may be beneficial.

±30 points between any sub-test and IQ score indicates the need to review sub-test and IQ testing procedures. Further student evaluation is required. Individualized educational programming is indicated.

3. The system classifies *isolated* IQ results into educational terms and offers some guidelines related to a student's probable academic abilities. For example, a student achieving an IQ score of 75 is termed Educationally Mentally Retarded (EMR). It is suggested that this student can "learn skills to approximately the 6th grade level by late

teens. The student cannot learn general high school subjects, without special programming or intervention. The student will need special education, particularly at high school levels."

Vocational Results

This system performs two operations related to vocational interests and aptitude results. The system converts raw score information of aptitude evaluative information into a percentile equivalent. The system compares percentile information of aptitude and interest assessments, and creates an easy to interpret graph representation of the results.

F. Modifications were made as appropriate to the expert system program and retesting took place.

ASSUMPTIONS

Results suggested in this program should be interpreted in consultation with an expert in the educational programming field. This program is designed only as a guideline in evaluating student performance based on selected standardized tests. The following factors may affect the results offered by this program:

1. Physical limitations of the student should be considered (ie auditory or visual impairments). Limitations my effect the student's ability to effectively respond during testing procedures. Therefore, a careful review of testing procedures and student responses is required prior to team decisions regarding individualized educational programming strategies.

2. This program offers suggestions based on comparisons and discrepancies between test results. Therefore, caution should be taken not to base programming decisions on isolated test score results.

3. When discrepancies are noted, the program recommends a review of testing procedures. Reviewing procedures will help to insure that errors were not made on the part of the evaluator. In addition, reviews may help the evaluator to identify specific problem

areas noted through review of the test responses, and thus help to determine the appropriate follow-up evaluative tool to be used.

4. When making decisions related to vocational programming, evaluators must be cautious not to put weight on either aptitude or interest results in isolation, but attempt to offer students guidance in areas where their interest and aptitude results are most similar.

LEVELS OF ADAPTIVE BEHAVIOR FOR THE MENTALLY RETARDED

LEVEL	EDUCATIONAL LABEL	IQ SCORE	SCHOOL AGE: 6-21 YEARS
Moderate Retardation	EMR	50-75	Can learn skills to approximately 6th grade level by late teens. Cannot learn general high school subjects, without special programming and or intervention. Needs special education, particularly at high school levels.
Moderate Retardation	TMR	35-49	Can learn functional academic skills to approximately 4th grade level by late teens if given special education.
Severe Retardation	SMR	20-34	Can talk and learn to communicate; Can be trained in elemental health habits; cannot learn functional academic skills; profits from systematic habit training.
Profound Retardation	PMR	Below 20	Some motor development present; cannot profit from training in self-help skills; needs total care.

EMR - Educationally Mentally Retarded
TMR - Trainable Mentally Retarded
SMR - Severely Mentally Retarded
PMR -Profoundly Mentally Retarded

APPENDIX A
List of Contacts Professional and Organizations

Project Contacts

Information from the following professionals were instrumental in the completion of this project. Many thanks and much appreciation is extended to these individuals and organizations.

Thomas Kippeny
Appalachian Intermediate Unit

Stout Vocational Training Manual
Mid-Nebraska MR Services
Hastings, Nebraska

David Webb
West Virginia Research Training Center
One Dunbar Plaza Suite E.
Dunbar, West Virginia

Lloyd Pindell
Wisconsin Vocational Studies Center
Madison, Wisconsin

Research and Training Center
University of Wisconsin-Stout
Menomonee, Wisconsin

Joe Coleman
Asst Supervisor of Special Education
Chester County

Dr. Pasquel
Shippensburg State University

Zolten Kristof
Pittsburgh Area
(412) 665-2286

Clark Lloyd
Psychologist
The Office of Curriculum
(814) 622-3500

Mr. Bauer
Capital Area I.U.
(717) 564-4841

Special Education Division
Northeast I. U.
(717) 344-9200

Andrea Rosse
Northwest Area I. U.
(814) 734-5610

Regional Resource Center
King of Prussia
(215) 265-7321

Regional Resource Center
Harrisburg
(717) 657-5840

Regional Resource Center
Gibsonia
(412) 443-7021

Lionel Lauer
Philadelphia
(215) 299-7823

Iris LeFever
Lancaster
(717) 569-7331

School District of Pittsburgh
Division of Curriculum Development
341 South Bellefield Ave
Pittsburgh

APPENDIX B

Sampling of Assessment Instruments Used With Special Needs Students

Sampling of Assessment Instruments Used With Special Needs Students

Briggance

Kauffman Assessment Battery

Metropolitan Achievement Test Primer

Peabody Individual Achievement Test

Stanford-Binet Intelligence Scale

Vineland Social Maturity Scale

Wechsler Intelligence Scale Children-Revised

Wide Range Achievement Test

Woodcock-Johnson Mastery Test, The Reading Passage Comprehension Sub-test

Appendix C

USERS GUIDE
IEP ASSESSMENT AID FOR SPECIAL NEEDS STUDENTS

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IEP ASSESSMENT AID FOR SPECIAL NEEDS STUDENTS

OVERVIEW

"Mainstreaming" and "normalization" are terms frequently used throughout our educational system. They refer to program planning and implementation for the special needs student. Frequently the special needs students is placed in a mainstream classroom in order to meet normalization criteria. Mainstream placement occurs in order to achieve the most appropriate and least restrictive classroom environment. Unfortunately, the mainstream classroom teacher is often inadequately prepared to meet the educational requirements of the special needs student. Learning how to identify, appropriately assess and program for the student requires additional time and training, not often provided the normal classroom teacher.

RECOMMENDED USE

This program will be utilized by school psychologists as a screening devise of standardized score results. Its purpose is to compare a student's achievement and intelligence scores in an attempt to identify those students who may benefit from further assessment and possibly a more individualized education program. The program will screen achievement sub-test scores to determine if there exists a marked discrepancy between spelling, reading and mathematics areas. Discrepancies in these areas will influence program planning for the vocational-agricultural student in regards to academic as well as vocational training.

In addition, this program will screen vocational aptitude and interest survey results of the student. Its purpose is to compare the student's percentile ranking results in vocational

areas, in an attempt to identify those vocational areas a student is most likely to succeed in, given the proper instruction and guidance.

It is proposed that by reducing the time factor required by the school psychologist to compare and interpret standardized scores, the school psychologist will be more readily available to offer the classroom teacher assistance with appropriate individualized assessment and program development.

OBJECTIVES

1. To identify those students whose standardized achievement and intelligence scores vary markedly from the norm.

2. To identify those students whose standardized achievement and intelligence scores vary markedly based on that particular student's results.

3. To offer general suggestions related to further assessment and programming for the student, based on standardized scores and academic programming.

4. To identify those areas of a student's vocational aptitude and interest survey results are most similar.

5. To offer general suggestions related to further assessment and programming for the student related to vocational training.

Description of Vocational Assessment Tools

The Singer Vocational Evaluative System(VES)

The VES is composed of a series of job samples that are individually complete. There is not a prescribed sequence of administration, nor is it necessary to complete a specific number of jobs. Selection of the most appropriate set of job samples to be administered should be based on the individual needs of the participant, availability of jobs and/or training, and time available for occupational work sampling. The job samples may be administered in any order, although it is suggested that job samples related to an individual's vocational interests be employed first. Administration time varies, but generally requires 2-21/2 hours per sample. All forms, equipment and materials are furnished within the VES. The VES includes an audiovisual format to ensure a

standardized presentation of job samples. Jot samples may be repeated by the subject. Repetition may be advantageous when the subject expresses a desire to attempt to improve his or her performance. Repetition may also permit an evaluator to measure learning while concomitantly demonstrating to a subject that he or she can learn new skills. The evaluator should become familiar with the contents of the VES manual and should complete the job sample, prior to administering the VES, regardless of the skills the evaluator may possess related to the job sample area.

Vocational Interest Assessment Survey (VIAS)

The VIAS is a unique interest assessment devise. The inventory utilizes an audio-visual format instead of verbal statements and emphasizes affective cognitive as opposed to verbal processes; it is designed primarily to tap affective responses.

The purpose of the VIAS is to help an individual identify areas of potential occupational exploration and training based on the participant's responses to work scenes. The VIAS attempts to breakdown career stereotyping and is particularly useful when used by individuals with academic difficulties.

VIAS eliminates the need for any special reading skills. This is beneficial for use, not only with populations such as the handicapped or academically disadvantaged, but also those whose native language is not English.

Occupations presented pictorially in the VIAS help to minimize the effect of verbal stereotyping. The VIAS is directed towards those individuals whose career decisions are likely to involve occupational training and attempts to minimize jobs which would require advanced academic skills and training. The occupational clusters presented by the survey represent careers which training is generally available in most communities. Career clusters are broad, but are composed of many related occupations.

SYSTEM REQUIREMENTS

You will need the following:

1. An Apple Macintosh computer (Mac Plus recommended) with two disk drives. (one disk drive if Microsoft Excel is loaded on a hard disk.
2. An Imagewriter or LaserWriter printer.
3. Microsoft Excel. Program
4. The Interpretation of *PDE Project Disk* and instructions (available through the Agricultural and Extension Education Department, PSU).

SUPPPORT CONTACTS

If you have any questions or problems, please contact one of the following for help:

Technical Assistance

Dr. Connie D. Baggett Ms. Kathleen Banski
Department of Agricultural Education and Extension
The Pennsylvania State University
(814) 863-3824

MANAGEMENT PROCEDURE

1. Make a backup copy of the original *PDE Project IEP Disk* before starting. See Appendix for backup instructions. Use the backup copy for entering data. Keep the original disk in a safe location-do not put any data on it.
2. Insert the disk labeled *PDE Project IEP Disk* in the internal drive. Then insert the *Microsoft Excel Program Disk* in the external drive.
3. Double-click on the icon named *PDE Project IEP Disk* to open it.
4. Double-click on the icon named *Special Student Evaluation* to open it.
5. Enter Inputs (This program is automatically calculated).

INPUT DESCRIPTIONS

1. Go to cell AU3

2. Enter student's name, press the RETURN key and enter address.

3. Enter student's age in years and months (use whole numbers) in cell AV6 and 7.

4. Enter student's WRAT raw scores for each subtest area (use whole numbers).

5. Enter student's IQ score (use whole numbers) in the labeled cells.

6. Enter student's Vocational Interest Survey Results in the labeled cells.

7. Enter student's Vocational Aptitude scores in the labeled cells.

OUTPUT DESCRIPTIONS

Achievement Results

The system will automatically convert raw score information to a standard score equivalent. Recommendations of WRAT results are based on subtests standardized score comparisons. The system will locate discrepancies and results will be indicated based on the following:

±15 points between Spelling or Reading or Math subtest scores indicates the need for further review of subtest results and procedures. Further student assessment in the specified subtest areas may be required. A curriculum which incorporates individualized educational programming may be beneficial.

±30 points between Spelling or Reading or Math subtest scores indicates a marked discrepancy in student performance. A review of subtest results and procedures is necessary. Further student assessment in the specified subtest areas may be required. A curriculum which incorporates individualized educational programming is indicated.

Intelligence Results

The system performs three operations related to IQ testing results. These are:

1. The system classifies the IQ score, in isolation, based on standardized

interpretations:

SCORE RANGES	CLASSIFICATION
130 and up	Very Superior
120-129	Superior
110-119	High Average
90-109	Average
80-89	Low Average
70-79	Borderline
60 and below	Deficient

2. The system compares achievement and IQ standardized results. The system identifies discrepancies and results are indicated based on the following:

±15 points between any subtest and IQ score indicates the need to review subtest results and IQ testing procedures. Further student evaluation may be required. Individualized educational programming may be beneficial.

±30 points between any subtest and IQ score indicates the need to review subtest and IQ testing procedures. Further student evaluation is required. Individualized educational programming is indicated.

3. The system classifies *isolated* IQ results into educational terms and offers some guidelines related to a student's probable academic abilities. For example, a student achieving an IQ score of 75 is termed Educationally Mentally Retarded (EMR). It is suggested that this student can "learn skills to approximately the 6th grade level by late teens. The student cannot learn general high school subjects, without special programming or intervention. The student will need special education, particularly at high school levels."

Vocational Results

This system performs two operations related to vocational interests and aptitude results. The system converts raw score information of aptitude evaluative information into

a percentile equivalent. The system compares percentile information of aptitude and interest assessments, and creates an easy to interpret graph representation of the results.

INTERPRETATION OF RESULTS

A discrepancy of ±15 points in any tested area, indicated the need for further review of students' test scores and evaluative procedures. Discrepancies may be attributed to student performance or an error made by the evaluator at the time of testing.

A discrepancy of ±30 points in any tested area indicates the need for further review of scores and testing procedures. ±30 points indicates a significant student deviation from standardized test norms. Therefore a more thorough and specific evaluation of a student's abilities is warranted.

It is suggested that the vocational evaluator review the graph information presented by the system. It is recommended that the evaluator further pursue either assessment or programming procedures in those areas represented by the graph, which projects a students results to be most similar. For example, a student who demonstrates a score of 100% interest in the area of :

INTEREST RESULTS	APTITUDE RESULTS	ASSESSMENT AREA
100%	80%	Agriculture*
100%	60%	Metal
50%	80%	Cosmetology
80%	80%	Food Services*

A student who demonstrates a score of 100% interest result, with an 80% aptitude result in Agriculture* might benefit from programming and training related to this career area, as opposed to a Metal area where the aptitude result suggests a larger discrepancy from the interest result.

A student who demonstrates a score of 80% aptitude result, with an 80% interest result in Food Services* might benefit from programming and training related to this career area, as opposed to a Cosmetology area where the interest result suggest a larger discrepancy from the aptitude result.

ASSUMPTIONS

Results suggested in this program should be interpreted in consultation with an expert in the educational programming field. This program is designed only as a guideline in evaluating student performance based on selected standardized tests. The following factors may affect the results offered by this program:

1. Physical limitations of the student should be considered (ie auditory or visual impairments). Limitations my effect the student's ability to effectively respond during testing procedures. Therefore, a careful review of testing procedures and student responses is required prior to team decisions regarding individualized educational programming strategies.

2. This program offers suggestions based on comparisons and discrepancies between test results. Therefore, caution should be taken not to base programming decisions on isolated test score results.

3. When discrepancies are noted, the program recommends a review of testing procedures. Reviewing procedures will help to insure that errors were not made on the part of the evaluator. In addition, reviews may help the evaluator to identify specific problem areas noted through review of the test responses, and thus help to determine the appropriate follow-up evaluative tool to be used.

4. When making decisions related to vocational programming, evaluators must be cautious not to put weight on either aptitude or interest results in isolation, but attempt to offer students guidance in areas where their interest and aptitude results are most similar.

APPENDIX

Using Microsoft Excel Software

Backup Instructions

To make a backup copy of an Excel program, you must copy the entire contents of the original (startup) disk to another disk. To backup the original disk:

1. Insert the disk containing the Master program into the internal disk drive. The disk icon is usually labeled with an abbreviated form of the program title. Example: *SpEd Eval* for the *Special Student Evaluation* program.

2. Insert a blank or "to-be-copied-over" disk into the external drive. Initialize it if necessary.

3. Select and drag the Master disk icon over the top of the new disk icon until the new disk icon turns black.

Example: Start-up (internal drive) disk icon- "PDE IEP Project".

New Disk (external drive) disk icon-"Blank".

An alert box will ask: Completely replace contents of "Blank" (external drive) disk with contents of "PDE IEP Project" (internal drive)? Click on the OK button.

4. When done copying, eject the original disk and store it in a safe place. Type in a new name for the backup disk icon (if desired). Use the backup copy for entering data.

Saving Data

1. Decide if you will save data on disk before you start.

It is recommended that you do not save data on this disk, rather you should save a printout of the calculated program with input data. If you desire to save the data to be inputted on the disk, make a copy of the entire disk before you start to input data. It is necessary to make a copy of the entire disk because each Excel program consists of

multiple documents, all of which are necessary for the operation of the program in the manner outlined in the MANAGEMENT PROCEDURE of the user guide.

2. **Do not use "Save As"**

The Excel program has two unique characteristics: The "Save As" command under the pull down menu "FILE" will allow you to change the name of your document and/or save the document to a different location, i.e. to the external drive.

3. Use the **"Save"** or **"Quit"** commands.

If you use the "Quit" commands from the Excel File menu, the computer will ask if you wish to save changes before quitting. If answer yes, it will save changes to the file you have been working with. If you wish to save changes to another file name, you must answer no and the click on then follow procedure two above.

4. Properly identify disks with saved data.

Mark the external (paper) label of the disk to indicate the exact contents. For example: *Special Student Evaluation*

Miss Smith - 4/23/88

Excel startup Disk

You may also change the name of the disk icon. The name of the disk icon can be an abbreviation of the name of the original disk, may have client identification, date run, etc. For example, *Special Student Evaluation*..-Smith, SpEd Eval-Smith-4/88, Scores-Smith-1988.

Changing Print Quality

Excel programs print at medium speed and quality, if you are using a dot matrix printer, i.e.ImageWriter II. If you should desire to change the quality of printing, use the following procedure:

1. Go to the Excel File menu and choose Print command. Click on the print quality button that you desire. Click on the OK button.

2. The printer will begin, so as soon as you see the dialog box displaying the message "To cancel printing hold down the Command key and type a period (.)," do so.

3. When quitting do not save this print quality change since others that use the disk may not prefer the speed and/or quality that you have chosen.

Interrupting the Printing Process

If you wish to interrupt a printing process started with the use of an Option-Command-letter combination, use the following procedure:

1. As soon as you see the dialog box displaying the message "To cancel printing hold down the command key and type a period (.)", do so.

2. Click on the halt button.

APPENDIX D

Sample Computer Output in Assessing Special Needs Students

SPECIAL STUDENT EVALUATION

STUDENT INFORMATION

STUDENT NAME >>> MARY GOODSTUDENT <<
ADDRESS >>> R. D. 1, ANYTOWN, PA <<
DATE: 3-19-89 *TIME:* 10:02 PM
STUDENT AGE YEARS >>> 12 <<<
MONTHS >>> 5 <<<

ACHIEVEMENT SCORES: BASED UPON THE:	SUB-TEST	RAW SCORE	STANDARD SCORE
WIDE RANGE ACHIEVEMENT TEST (WRAT)	SPELLING >	27	106
	MATH >	32	111
	READING >	17	51

INTELLIGENCE SCORE: BASED UPON THE:	IQ SCORE:	69 <<<	
VOCATIONAL INTEREST SURVEY RESULTS	*TYPE IN TEST #*	*TYPE IN RAW SCORE*	CALCULATED PERCENTILE SCORE
ENTER 1 FOR "BUSINESS SECRETARY:"	1	26	95 <=:
ENTER 2 FOR "ELECTRICAL/ELECTRONICS:"	2	26	90 <=:
ENTER 3 FOR "TRADE & INDUSTRY; CONSTRUCTION:"	3	26	80
ENTER 4 FOR "SERVICE; BARBERING/COSMETOLOGY:"	4	26	85
ENTER 5 FOR "BUSINESS; DATA PROCESSING:"	5	26	85
ENTER 6 FOR "AGRICULTURE/ENVIRONMENT:"	6	26	75
ENTER 7 FOR "COMMUNICATIONS; ARTS/GRAPHICS:"	7	26	85
ENTER 8 FOR "FOOD SERVICES:"	8	26	90 <=:
ENTER 9 FOR "TRADE & INDUSTRY; MECHANICAL:"	9	26	85
ENTER 10 FOR "HEALTH SERVICES:"	10	26	75
ENTER 11 FOR "CRIMINAL JUSTICE:"	11	26	80
ENTER 12 FOR "BUSINESS; RETAIL SALES:"	12	26	95 <=:
ENTER 13 FOR "ENGINEERING TECHNOLOGY:"	13	26	85
ENTER 14 FOR "SCIENCE & LABORATORY:"	14	26	80
ENTER 15 FOR "SERVICE-PERSONAL:"	15	26	55
ENTER 16 FOR "TRADE & INDUSTRY; METAL TRADES:"	16	26	85
ENTER 17 FOR "SERVICE; FIRE SCIENCE:"	17	26	55

PROGRAMS WITH SCORES OF 95 **ARE RECOMMENDED**
CHECK PROGRAMS INDICATED BY AN <== AS POSSIBILITIES.

SPECIAL STUDENT EVALUATION

SINGER APTITUDE CHART-APTITUDE RESULTS *ENTER AREA BELOW, i.e. CARPENTRY*	*ENTER TIME*	*ENTER # ERRORS*	PERCENTILE
CARPENTRY	5	5	100
PLUMBING	4	5	96
ELECTRICAL	5	3	60

ACHIEVEMENT RESULTS
USE RECOMMENDATIONS BELOW FOR: MARY GOODSTUDENT

REVIEW MATH AND READING SUBTESTS
INDIVIDUALIZED PROGRAMMING IS INDICATED

REVIEW READING AND SPELLING SUBTESTS
INDIVIDUALIZED PROGRAMMING IS INDICATED

INTELLIGENCE RESULTS
CLASSIFICATION FOR: MARY GOODSTUDENT

IQ CLASSIFIES STUDENT AS:
DEFICIENT

SUGGESTIONS FOR EDUCATIONAL PROGRAMMING:

REVIEW SPELLING AND IQ TESTING PROCEDURES. INDIVIDUALIZED PROGRAMMING IS INDICATED
REVIEW MATH AND IQ TESTING PROCEDURES. INDIVIDUALIZED PROGRAMMING IS INDICATED

EDUCATIONAL CLASSIFICATIONS FOR STUDENT IS:

EDUCABLY MENTALLY RETARDED (EMR)

CAN LEARN TO APPROXIMATELY SIXTH GRADE LEVEL BY LATE TEENS.
CANNOT LEARN GENERAL HIGH SCHOOL SUBJECTS, WITHOUT SPECIAL PROGRAMMING OR INTERVENTION. REQUIRES SPECIAL EDUCATION PARTICULARILY AT HIGH SCHOOL LEVELS

APPENDIX E

Computer Programmed Information

A	B	C	D	E	F	G	H	I	J	K	L	M	N
					LOOKUP TABLE FOR STANDARD SCORE BASED UPON AGE								
Strd. Score	Raw Score Spell	Raw Score Math	Raw Score Read		Strd. Score	Raw Score Spell	Raw Score Math	Raw Score Read		Strd. Score	Raw Score Spell	Raw Score Math	Raw Score Read
46			14		46			14		46		13	
47		13			47		13			47			14
48			15		48			15		48			
49					49					49		14	15
50			16		50			16		50			16
51	1	14	17		51	1	14	17		51	1		
52					52					52		15	17
53	2		18		53	2		18		53	2		18
54		15	19		54		15	19		54			
55	3				55	3				55	3	16	19
56			20		56			20		56			20
57		16	21		57		16	21		57	4		
58	4				58	4				58		17	21
59			22		59			22		59	5		22
60	5				60	5				60			
61		17	23		61		17	23		61	6	18	23
62	6		24		62	6		24		62			24
63					63					63	7		
64	7	18	25		64	7	18	25		64			25
65			26		65			26		65	8	19	26
66	8				66	8				66			
67		19	27		67		19	27		67	9		27
68	9		28		68	9		28		68		20	28
69					69					69	10		
70	10		29		70	10		29		70			29
71		20			71		20			71	11	21	30
72	11		30		72	11		30		72			
73			31		73			31		73	12		31
74	12	21			74	12	21			74		22	32
75			32		75			32		75	13		
76	13		33		76	13		33		76			33
77					77					77	14	23	34
78		22	34		78		22	34		78			
79	14				79	14				79	15		35
80			35		80			35		80		24	36
81	15	23	36		81	15	23	36		81	16		
82					82					82			37
83	16		37		83	16		37		83	17	25	38
84		24	38		84		24	38		84			
85	17				85	17				85	18		39
86			39		86			39		86		26	40
87	18		40		87	18		40		87	19		
88		25			88		25			88			41
89	19		41		89	19		41		89	20	27	42
90					90	20	26			90			
91	20	26	42		91			42		91	21		43
92			43		92			43		92		28	44
93					93					93			
94	21	27	44		94	21	27	44		94	22		45

BEST COPY AVAILABLE

SPECIAL STUDENT EVALUATION

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
107	148			77		148			77		148	49		81
108	149		43	78		149		43	78		149			82
109	150	47				150	47				150	50	47	
110	151	48		79		151	48		79		151			83
111	152		44	80		152		44	80		152	51		84
112	153					153					153		48	
113	154	49		81		154	49		81		154			85
114	155		45			155		45			155			86
115					(12.5-12.9)					(13.0-13.4)				
116	CONVERT Mo/Yr AGE TO DECIMAL SYSTEM =							12.40						
117	RAW SCORE CONVERSION					RAW SCORE CONVERSION					RAW SCORE CONVERSI			
118	RAW	27	32	17			27	32	17			27	32	17
119	STRD	106	111	51			0	0	0			0	0	0
120	IQ													

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1		LOOKUP TABLE FOR STANDARD SCORE BASED UPON AGE: SECT #2												
2	Strd.	Raw	Raw	Raw		Strd.	Raw	Raw	Raw		Strd.	Raw	Raw	Raw
3	Score	Score	Score	Score		Score	Score	Score	Score		Score	Score	Score	Score
4		Spell	Math	Read			Spell	Math	Read			Spell	Math	Read
5	46		13			46		13	17		46			17
6	47			15		47					47	1		18
7	48	1		16		48	1		18		48		14	19
8	49		14			49		14	19		49	2		
9	50	2		17		50	2		20		50		15	20
10	51			18		51		15			51	3		21
11	52	3	15			52	3		21		52			22
12	53			19		53			22		53	4	16	
13	54	4	16	20		54	4	16			54			23
14	55			21		55			23		55	5	17	24
15	56	5				56	5		24		56			25
16	57		17	22		57		17	25		57	6		
17	58	6		23		58	6				58		18	26
18	59					59			26		59	7		27
19	60	7	18	24		60	7	18	27		60	8	19	28
20	61			25		61					61			
21	62	8				62	8		28		62	9		29
22	63		19	26		63		19	29		63		20	30
23	64	9		27		64	9		30		64	10		31
24	65					65	10				65		21	
25	66	10	20	28		66		20	31		66	11		32
26	67			29		67	11		32		67			33
27	68	11				68		21			68	12	22	
28	69		21	30		69	12		33		69			34
29	70	12		31		70			34		70	13	23	35
30	71					71	13	22	35		71			36
31	72	13	22	32		72					72	14		
32	73			33		73	14		36		73		24	37
33	74	14		34		74		23	37		74	15		38
34	75		23			75	15		38		75	16		39
35	76	15		35		76					76		25	
36	77			36		77	16	24	39		77	17		40
37	78	16	24			78			40		78		26	41
38	79			37		79	17				79	18		42
39	80	17		38		80		25	41		80			
40	81		25			81	18		42		81	19	27	43
41	82	18		39		82			43		82			44
42	83			40		83	19	26			83	20	28	45
43	84	19	26			84	20		44		84			
44	85			41		85		27	45		85	21		46
45	86	20		42		86	21				86		29	47
46	87		27			87			46		87	22		48
47	88	21		43		88	22	28	47		88		30	
48	89			44		89			48		89	23		49
49	90	22	28	45		90	23				90	24		50
50	91					91		29	49		91		31	51
51	92	23		46		92	24		50		92	25		
52	93		29	47		93					93		32	52
53	94	24				94	25	30	51		94	26		53

SPECIAL STUDENT EVALUATION

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
54	95			48		95			52		95			54
55	96	25	30	49		96	26		53		96	27	33	
56	97					97		31			97			55
57	98	26		50		98	27		54		98	28	34	56
58	99		31	51		99			55		99			57
59	100	27				100	28	32	56		100	29		
60	101			52		101					101		35	58
61	102	28	32	53		102	29	33	57		102	30		59
62	103					103	30		58		103			60
63	104	29		54		104					104	31	36	
64	105		33	55		105	31	34	59		105	32		61
65	106	30		56		106			60		106		37	62
66	107					107	32		61		107	33		63
67	108	31	34	57		108		35			108			
68	109			58		109	33		62		109	34	38	64
69	110	32				110			63		110			65
70	111		35	59		111	34	36			111	35	39	66
71	112	33		60		112			64		112			
72	113					113	35		65		113	36		67
73	114	34	36	61		114		37	66		114		40	68
74	115			62		115	36				115	37		69
75	116	35				116			67		116		41	
76	117		37	63		117	37	38	68		117	38		70
77	118	36		64		118					118			71
78	119					119	38	39	69		119	39	42	72
79	120	37	38	65		120			70		120	40		
80	121			66		121	39		71		121		43	73
81	122	38		67		122	40	40			122	41		74
82	123		39			123			72		123			75
83	124	39		68		124	41		73		124	42	44	
84	125			69		125		41	74		125			76
85	126	40	40			126	42				126	43	45	77
86	127			70		127			75		127			78
87	128	41		71		128	43	42	76		128	44		
88	129		41			129					129		46	79
89	130	42		72		130	44		77		130	45		80
90	131			73		131		43	78		131			81
91	132	43	42			132	45		79		132	46	47	
92	133			74		133					133			82
93	134	44		75		134	46	44	80		134	47	48	83
94	135		43			135			81		135	48		84
95	136	45		76		136	47	45			136			
96	137			77		137			82		137	49	49	85
97	138	46	44	78		138	48		83		138			86
98	139					139	49	46	84		139	50	50	87
99	140	47		79		140					140			
100	141		45	80		141	50		85		141	51		88
101	142	48				142		47	86		142		51	89
102	143			81		143	51				143			
103	144	49	46	82		144			87		144		52	
104	145					145		48	88		145			
105	146	50		83		146			89		146			
106	147		47	84		147					147		53	

SPECIAL STUDENT EVALUATION

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
107	148	51				148		49			148			
108	149			85		149					149		54	
109	150		48	86		150		50			150			
110	151					151					151			
111	152			87		152					152		55	
112	153		49	88		153		51			153			
113	154					154					154			
114	155		50	89		155					155		56	
115	3.5-13.9)					(14.0-14.9)					(15.0-15.9)			
116														
117	RAW SCORE CONVERSION					RAW SCORE CONVERSION					RAW SCORE CONVERSI			
118		27	32	17			27	32	17			27	32	17
119		0	0	0			0	0	0			0	0	0
120														

	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1		LOOKUP TABLE FOR STANDARD SCORE BASED UPON AGE: SECT. #3												
2	Strd.	Raw	Raw	Raw		Strd.	Raw	Raw	Raw		Strd.	Raw	Raw	Raw
3	Score	Score	Score	Score		Score	Score	Score	Score		Score	Score	Score	Score
4		Spell	Math	Read			Spell	Math	Read			Spell	Math	Read
5	46	3		19		46	3		20		46	3		21
6	47			20		47		14			47		14	22
7	48	4	14	21		48	4		21		48	4		23
8	49			22		49		15	22		49	5		24
9	50	5	15			50	5		23		50		15	
10	51			23		51		16	24		51	6		25
11	52	6	16	24		52	6		25		52		16	26
12	53			25		53					53	7		27
13	54	7				54	7	17	26		54		17	28
14	55	8	17	26		55	8		27		55	8		29
15	56			27		56		18	28		56	9	18	
16	57	9	18	28		57	9		29		57			30
17	58			29		58		19			58	10		31
18	59	10				59	10		30		59		19	32
19	60		19	30		60			31		60	11		33
20	61	11		31		61	11	20	32		61		20	34
21	62		20	32		62			33		62	12		
22	63	12				63	12	21	34		63	13	21	35
23	64	13	21	33		64	13				64			36
24	65			34		65			35		65	14		37
25	66	14		35		66	14	22	36		66			38
26	67		22	36		67			37		67	15		39
27	68	15				68	15	23	38		68		22	40
28	69		23	37		69					69	16		
29	70	16		38		70	16	24	39		70	17	23	41
30	71	17		39		71	17		40		71			42
31	72		24	40		72			41		72	18	24	43
32	73	18				73	18	25	42		73			44
33	74		25	41		74					74	19	25	45
34	75	19		42		75	19	26	43		75			
35	76			43		76			44		76	20	26	46
36	77	20	26			77	20	27	45		77	21		47
37	78			44		78			46		78			48
38	79	21	27	45		79	21		47		79	22	27	49
39	80			46		80	22	28			80			50
40	81	22	28	47		81			48		81	23	28	
41	82	23				82	23	29	49		82			51
42	83			48		83			50		83	24	29	52
43	84	24	29	49		84	24	30	51		84	25		53
44	85			50		85					85		30	54
45	86	25	30			86	25		52		86	26		55
46	87			51		87		31	53		87			
47	88	26		52		88	26		54		88	27	31	56
48	89		31	53		89	27	32	55		89			57
49	90	27		54		90					90	28	32	58
50	91		32			91	28	33	56		91	29		59
51	92	28		55		92			57		92		33	60
52	93	29		56		93	29		58		93	30		61
53	94		33	57		94		34	59		94		34	

	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
54	95	30				95	30		60		95	31		62
55	96		34	58		96	31	35			96			63
56	97	31		59		97			61		97	32	35	64
57	98		35	60		98	32	36	62		98	33		65
58	99	32		61		99			63		99		36	66
59	100					100	33		64		100	34		
60	101	33	36	62		101		37			101		37	67
61	102			63		102	34		65		102	35		68
62	103	34	37	64		103		38	66		103	36	38	69
63	104	35				104	35		67		104			70
64	105			65		105	36	39	68		105	37		71
65	106	36	38	66		106					106		39	
66	107			67		107	37		69		107	38		72
67	108	37	39	68		108		40	70		108		40	73
68	109					109	38		71		109	39		74
69	110	38	40	69		110		41	72		110	40	41	75
70	111			70		111	39		73		111			76
71	112	39		71		112		42			112	41	42	
72	113		41			113	40		74		113			77
73	114	40		72		114	41		75		114	42		78
74	115	41	42	73		115		43	76		115	43		79
75	116			74		116	42		77		116		43	80
76	117	42		75		117		44			117	44	44	81
77	118		43			118	43		78		118			82
78	119		43	76		119		45	79		119	45	45	
79	120		44	77		120	44		80		120			83
80	121	44		78		121	45		81		121	46	46	84
81	122			79		122		46			122			85
82	123	45	45			123	46		82		123	47		86
83	124			80		124		47	83		124	48	47	87
84	125	46	46	81		125	47		84		125			
85	126	47		82		126		48	85		126	49	48	88
86	127		47			127	48		86		127			89
87	128	48		83		128					128	50	49	
88	129			84		129	49	49	87		129			
89	130	49	48	85		130	50		88		130	51	50	
90	131			86		131		50	89		131			
91	132	50	49			132	51				132		51	
92	133			87		133		51			133			
93	134	51		88		134					134			
94	135		50	89		135					135		52	
95	136					136		52			136			
96	137		51			137					137		53	
97	138					138		53			138			
98	139		52			139					139		54	
99	140					140					140			
100	141					141		54			141		55	
101	142		53			142					142			
102	143					143		55			143			
103	144		54			144					144		56	
104	145					145		56			145			
105	146					146					146		57	
106	147		55			147					147			

SPECIAL STUDENT EVALUATION

	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
107	148					148		57			148		58	
108	149		56			149					149			
109	150					150		58			150		59	
110	151					151					151			
111	152		57			152		59			152			
112	153					153					153		60	
113	154		58			154					154			
114	155					155		60			155		61	
115	(6.0-17.9)					(18.0-19.9)					(20.0-24.9)			
116														
117	RAW SCORE CONVERSION					RAW SCORE CONVERSION					RAW SCORE CONVERSI			
118		27	32	17			27	32	17			27	32	17
119		0	0	0			0	0	0			0	0	0
120														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
121														
122	PICKING UP CORRECT VALUES													
123	*SPELLING*		106											
124	*MATH*		111											
125	*READING*		51											
126														
127	AGE													
128	MO.	CONVERT												
129														
130	0	0.00												
131	1	0.10												
132	2	0.10												
133	3	0.20												
134	4	0.30												
135	5	0.40												
136	6	0.50												
137	7	0.60												
138	8	0.60												
139	9	0.70												
140	10	0.80												
141	11	0.90												
142														
143														
144	IQ:ACHIEVEMENT SUGGESTIONS													
145														
146														
147														
148														
149	REVIEW SPELLING AND IQ TESTING PROCEDURES. INDIVIDUALIZED PROGRAMMING IS INDICATED													
150	REVIEW MATH AND IQ TESTING PROCEDURES. INDIVIDUALIZED PROGRAMMING IS INDICATED													
151														

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
121														
122	EDUCATIONAL LABELS INFORMATION													
123	IQ	Label				RECOMMENDATIONS								
124	50-75	EMR		CAN LEARN TO APPROXIMATELY SIXTH GRADE LEVEL BY LATE TEENS.										
125				CANNOT LEARN GENERAL HIGH SCHOOL SUBJECTS, WITHOUT SPECIAL										
126				PROGRAMMING OR INTERVENTION. REQUIRES SPECIAL EDUCATION										
127				PARTICULARILY AT HIGH SCHOOL LEVELS										
128														
129	35-49	TMR		CAN LEARN FUNCTIONAL ACADEMICS SKILLS TO APPROXIMATELY FOURTH										
130				GRADE LEVEL BY LATE TEENS IF GIVEN SPECIAL EDUCATION										
131														
132	20-34	SMR		CAN TALK AND LEARN HOW TO COMMUNICATE; CAN BE TRAINED IN										
133				ELEMENTAL HEALTH HABITS; CANNOT LEARN FUNCTIONAL ACADEMIC										
134				SKILLS; PROFITS FROM SYSTEMATIC HABIT TRAINING										
135														
136	BELOW	PMR		SOME MOTOR DEVELOPMENT PRESENT; CANNOT PROFIT FROM TRAINING										
137	20			IN SELF-HELP SKILLS; NEEDS TOTAL CARE										
138														
139				EMR- EDUCABLY MENTALLY RETARDED										
140				TMR- TRAINABLE MENTALLY RETARDED										
141				SMR- SEVERLY MENTALLY RETARDED										
142				PMR- PROFOUNDLY MENTALLY RETARDED										
143														
144														
145														
146														
147														
148														
149														
150														
151														

	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
227											
228					VOCATIONAL ASSESSMENT						
229					CALCULATION TABLE						
230											
231	RAW	%-tile	TEST								
232	Score	Score	#			PROGROMA NAME					
233	26	95	1		95	BUSINESS SECRETARY					
234	26	90	2		90	ELECTRICAL/ELECTRONICS					
235	26	80	3		80	TRADE & INDUSTRY: CONSTRUCTION					
236	26	85	4		85	SERVICE: BARBERING/COSMETOLOGY					
237	26	85	5		85	BUSINESS: DATA PROCESSING					
238	26	75	6		75	AGRICULTURE/ENVIRONMENT					
239	26	85	7		85	COMMUNICATIONS:ARTS/GRAPHICS					
240	26	90	8		90	FOOD SERVICES					
241	26	85	9		85	TRADE &INDUSTRY:MECHANICAL					
242	26	75	10		75	HEALTH SERVICES					
243	26	80	11		80	CRIMINAL JUSTICE					
244	26	95	12		95	BUSINESS: RETAILING/SALES					
245	26	85	13		85	ENGINEERING TECH					
246	26	80	14		80	SCIENCE & LABORATORY					
247	26	55	15		55	SERVICE-PERSONAL					
248	26	85	16		85	TRADE & INDUSTRY-METAL TRADES					
249	26	55	17		55	SERVICE:FIRE SCIENCE					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
227					VOCATIONAL INTEREST ASSESSMENT SYSTEM (VIAS)									
228							*PERCENTILE TABLE*							
229								Part #1						
230														
231					CAREER CLUSTER SCORES									
232	RAW SCORE >>>>			0	7	8	9	10	11	12	13	14	15	16
233	BUSINESS-SECRETAR			0	2	5	10	15	15	20	30	35	45	55
234	ELECTRICAL													
235	ELECTRONICS			0	2	10	15	20	25	30	35	35	45	45
236														
237	TRADE & INDUSTRY													
238	CONSTRUCTION			0	5	10	20	20	25	25	30	35	35	45
239														
240	SERVICE, BARBER													
241	COSMETOLOGY			0	5	15	20	20	25	30	35	45	45	55
242														
243	BUS.-DATA PROCESS			0	2	5	10	15	20	25	30	35	45	45
244	AGRICULTURE													
245	ENVIRONMENT			0	1	2	5	10	15	20	20	25	30	35
246														
247	COMMUNICATIONS:													
248	ARTS/GRAPHICS			0	1	1	2	5	5	5	10	15	15	25
249														
250	FOOD SERVICES			0	10	20	25	30	35	45	45	55	55	65
251														
252	TRADE &INDUSTRY:													
253	MECHANICAL			0	10	25	30	30	35	35	45	45	55	55
254														
255	HEALTH SERVICES			0	2	5	10	10	15	20	25	25	30	35
256														
257	CRIMINAL JUSTICE			0	10	20	25	30	35	35	45	45	55	55
258														
259	BUSINESS:													
260	RETAILING/SALES			0	1	1	1	5	5	10	15	25	30	35
261														
262	ENGINEERING TECH			0	1	5	10	10	15	15	20	30	35	35
263	SCIENCE													
264	& LABORATORY			0	5	10	10	15	20	25	30	30	35	45
265														
266	SERVICE-PERSONAL			0	2	5	10	10	15	15	20	25	30	30
267														
268	TRADE & INDUSTRY:													
269	METAL TRADES			0	10	25	30	35	45	45	55	55	65	70
270														
271	SERVICE:													
272	FIRE SCIENCE			0	5	10	15	15	20	20	20	20	25	30

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
227				VOCATIONAL INTEREST ASSESSMENT SYSTEM (VIAS)										
228							*PERCENTILE TABLE*							
229								Part #2						
230														
231														
232	17	18	19	20	21	22	23	24	25	26	27	28	29	30
233	55	65	65	70	75	80	85	85	90	95	95	95	95	95
234														
235	55	55	65	70	75	75	80	80	85	90	95	95	98	98
236														
237														
238	45	45	55	55	65	65	70	75	80	80	85	90	95	95
239														
240														
241	55	65	70	70	75	75	80	80	85	85	90	90	95	98
242														
243	55	65	70	70	75	75	80	85	85	85	90	95	90	95
244														
245	35	45	45	55	55	55	65	65	70	75	80	85	98	98
246														
247														
248	30	35	45	55	55	65	70	75	80	85	90	95	95	95
249														
250	70	70	75	80	80	80	85	85	85	90	90	90	95	95
251														
252														
253	65	65	65	70	70	75	75	80	80	85	85	90	95	95
254														
255	45	45	55	55	55	65	65	70	70	75	80	85	90	90
256														
257	65	65	65	65	70	70	75	75	75	80	85	90	95	95
258														
259														
260	45	55	55	65	70	80	85	90	95	95	95	98	99	99
261														
262	45	45	55	55	65	65	70	75	80	85	90	90	95	85
263														
264	45	55	55	65	65	70	75	75	80	80	85	90	90	75
265														
266	35	35	35	45	45	55	55	55	55	55	55	65	75	95
267														
268														
269	70	70	75	75	80	80	80	80	85	85	90	95	95	95
270														
271														
272	35	35	35	40	40	40	45	55	55	55	65	70	80	95

	AC	AD	AE	AF	AG
227	VOCATIONAL INTEREST				
228	ASSESSMENT SYSTEM (VIAS)				
229		*PERCENTILE TABLE*			
230			Part #3		
231					
232	31	32	33	34	35
233	98	99	99	99	99
234					
235	99	99	99	99	99
236					
237					
238	95	95	98	99	99
239					
240					
241	98	98	98	99	99
242					
243	95	95	98	98	99
244					
245	99	99	99	99	99
246					
247					
248	95	98	99	99	99
249					
250	95	95	98	98	99
251					
252					
253	95	95	98	98	99
254					
255	95	95	98	99	99
256					
257	95	95	95	95	99
258					
259					
260	99	99	99	99	99
261					
262	98	98	99	99	99
263					
264	95	98	98	99	99
265					
266	80	80	85	85	95
267					
268					
269	95	98	98	99	99
270					
271					
272	95	90	90	95	98