DOCUMENT RESUME

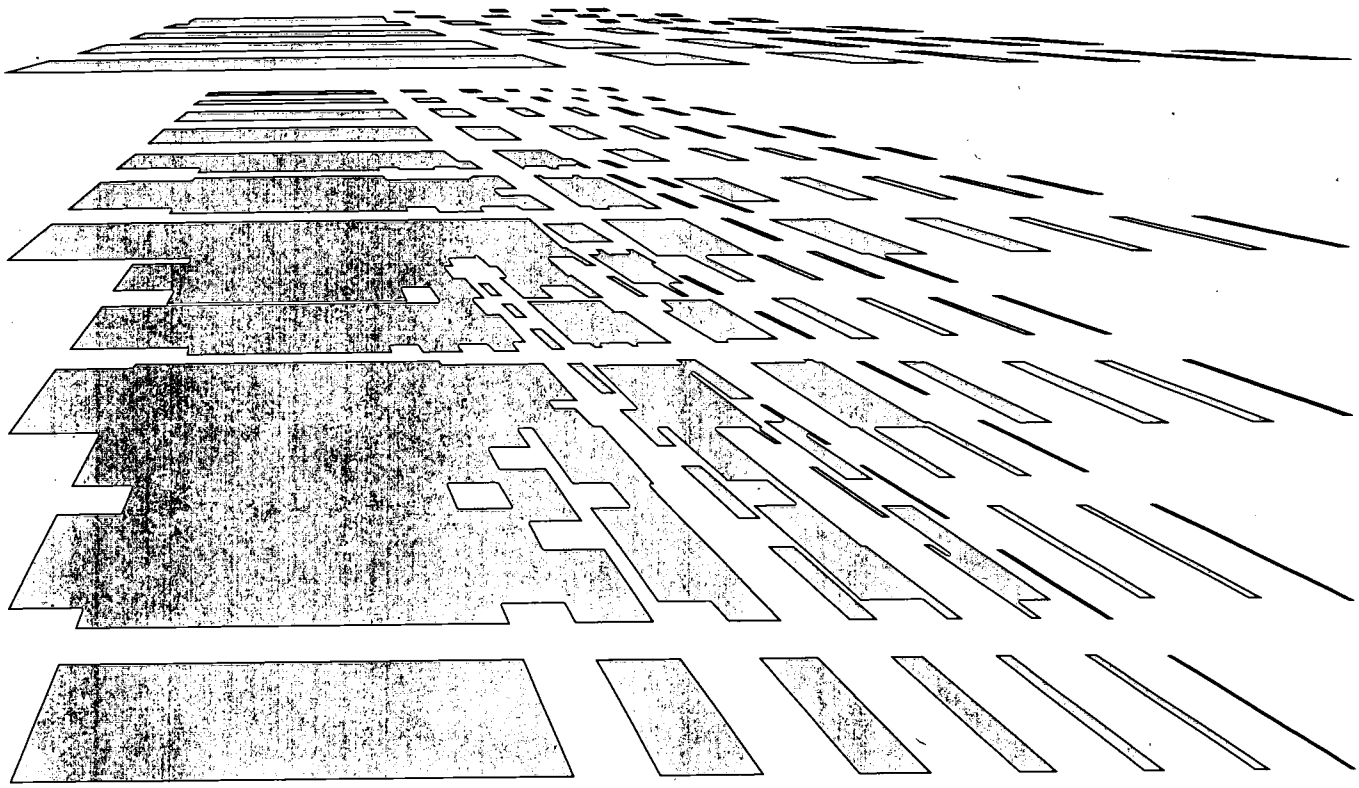
ED 400 437 CE 072 800

TITLE	A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations. Final Report.
INSTITUTION	Comprehensive Adult Student Assessment System, San Diego, CA.
SPONS AGENCY	Iowa State Dept. of Education, Des Moines. Div. of Community Colleges.
PUB DATE	Oct 96
NOTE	90p.
AVAILABLE FROM	CASAS, 8910 Clairemont Mesa Blvd., San Diego, CA 92123-1104.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Academic Achievement; Adult Basic Education; *Basic Skills; *Education Work Relationship; Employment Potential; Employment Programs; Job Skills; Job Training; *Mathematics Skills; *Reading Skills; State Programs; Statewide Planning
IDENTIFIERS	Iowa; *Job Opportunities and Basic Skills Program; *Job Training Partnership Act 1982

ABSTRACT

A study provided accurate and reliable norms that reflected the reading and math performance levels of Iowa's youth and adults engaged in work force preparation and employment training for basic skills. The study population included 819 participants from the Job Training Partnership Act (JTPA) and Iowa's Job Opportunities and Basic Skills programs (PROMISE JOBS) from 11 community colleges. Participants completed a background information sheet and were assessed with CASAS (Comprehensive Adult Student Assessment System) Employability Competency System Appraisal Form 130 or Form 400. Results were reported on a common, five-level scale, ranging from A (Pre-Literacy) to E (Advanced Adult Secondary). The largest percentage of participants scored in Level D or E in reading. The highest percentage scored Level C in math. JTPA participants scored higher in math and lower in reading. The mean reading score for females was nearly four points higher. The mean reading score of those 18 and younger was lower than that of all other age groups except those aged 50 or older. The mean math scores of those 19-25 were higher than those 18 and younger and those 40-49. In general, a greater percentage of the participants who had completed more years of school scored higher in reading and math. Study results could be used in educational achievement reporting, measurement of progress toward benchmarks, and program planning, counseling, and referral. (Appendixes contain 20 references, CASAS information, and standard deviations and tables of significance.) (YLB)

A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations



Final Report

Prepared for
Iowa's Community College
Adult Basic Education Program

by CASAS Comprehensive Adult Student Assessment System

October 1996

Ordering Information

For information on ordering additional copies of *A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations*, contact:

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Acknowledgments

A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Population was completed through the cooperation, guidance, interest, and assistance of many individuals and groups who devoted their time, energy and expertise to all areas of the project. The principle investigators express appreciation to the individuals and groups who participated and assisted in making this study a successful reality.

Special recognition is given to those in Iowa's community colleges who administered and collected the CASAS Employability Competency System appraisals, as well as to the individuals who took the appraisals and provided information about their backgrounds.

This report was co-authored by **Jane Egüez, Linda Taylor,** and **Terri Bergman,** with **Patricia Rickard** from the Comprehensive Adult Student Assessment System (CASAS) in San Diego. Patricia Rickard also participated in the design, analysis, and interpretation of the survey. **Randall Ilas, Carol Bakken,** and **John Martois** were responsible for data analysis. The report was edited by **Nancy Taylor. Diane Bailey** and **Cristiane Henke** handled the report's graphic design and production. Finally, thanks to the other **members of the CASAS staff** who assisted in a variety of ways. Without their support, this project could not have been completed.

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A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations

Executive Summary

OVERVIEW

A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations provides critical information about the basic skills levels required for Iowa's target populations to successfully pursue employment and further education (i.e., taking and passing the GED) and enter vocational/technical training programs. Basic skills norming information from this study can also be used by instructors, counselors, and employers to determine whether, and to what extent, individuals need basic skills instruction.

This study is the third in a series of three reports prepared by the Comprehensive Adult Student Assessment System (CASAS) for Iowa's community college adult basic education program.[1] Reflecting the increased importance being placed on the role of workforce preparation as an integral component of Iowa's economic development emphasis, the three reports provide the foundation for a statewide adult basic education accountability system with a strong business and industry focus.

The CASAS studies were commissioned as part of Iowa's effort to address the literacy needs of its citizens. While Iowa's adults have higher levels of literacy, on average, than adults nationwide, their basic skills levels are similar to those of adults in other midwestern states. The *Iowa State Adult Literacy Survey (IASALS)* found that 22 to 26 percent of Iowa's adult population lack basic workforce skills (Jenkins and Kirsch, 1994).

GOALS AND OBJECTIVES

The overall purpose of the norming study, in conjunction with the first two studies in this series, is to provide the state of Iowa with the information it needs to establish a statewide adult basic education accountability system with a strong business and industry focus.

[1]The first two studies, available from CASAS, are *The Iowa Adult Basic Skills Survey (IABSS)* (April 1995), and *Assessment of Basic Skills Competencies in Iowa's Employment and Workforce Programs* (November 1995).

The first study, *The Iowa Adult Basic Skills Survey (IABSS)*, determined the basic skills needed in the workforce. The second study, *Assessment of Basic Skills Competencies in Iowa's Employment and Workforce Programs*, provided the tools for measuring individuals' abilities *vis-a-vis* these skills. This third and final study, *A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations*, provides instructors, counselors, and employers with information to determine whether individuals are job ready (i.e., possess the basic skills needed in the Iowa workforce) or need additional basic skills instruction.

The objectives of the norming study were to:

- Provide accurate and reliable norms that reflect the reading and math performance levels of Iowa's youth and adults engaged in workforce preparation and employment training for basic skills.
- Provide reference tables to show the relationship between:
  - CASAS scaled scores and educational levels; and
  - CASAS scaled scores and probable GED passing levels.
- Provide accurate and reliable information on score cut-off points to enable:
  - Learners to make important and realistic education and career decisions based on their own basic skills levels;
  - Instructors to plan training with learners, including determining the possible length of study time needed; and
  - Employers to make employment decisions and determine if their workforce needs additional basic skills training.
- Enable programs to report levels of educational functioning based on CASAS scaled scores for Iowa's Annual Performance Report for the Adult Education State-Administered Program.
- Collect the necessary data about reading and math skills levels for future development of a customized Iowa appraisal instrument to assess competency areas identified by the *Iowa Adult Basic Skills Survey (IABSS)*.
- Develop a preliminary database for all agencies involved in employability basic skills assessment and/or instruction.

METHODOLOGY

Sampling

The study population for *A Workforce Basic Skills Norming Study* included participants from the JTPA (Job Training Partnership Act) and PROMISE JOBS (Iowa's Job Opportunities and Basic Skills) programs from 11 of Iowa's 15 community colleges. The objective of both JTPA and PROMISE JOBS is to bring participants into unsubsidized and self-sustaining employment. JTPA and PROMISE JOBS participants are eligible for basic skills training programs at Iowa community colleges as part of preparation to help them acquire the necessary workforce skills to obtain and maintain employment.

Data Collection

Participants were asked to complete a background information sheet and take an assessment of their basic reading and math skills. Participants provided background information on such items as: 1) program type (JTPA and/or PROMISE JOBS), 2) gender, 3) age, 4) ethnicity, 5) native language, and 6) level of education.

The assessment measured their basic reading and math skills within the context of employment and adult life skills, and covered a high percentage of the employability competencies identified as "top" or "high" priorities by key stakeholders in Iowa.

Study Response

In sum, 819 individuals participated in the study, ranging from 15 at Northwest Iowa Technical College to 147 at Indian Hills Community College.

CASAS Employability Competency System (ECS) Appraisals

Seven hundred five (86%) of the respondents were assessed with CASAS ECS Appraisal Form 130, while 114 (14%) were assessed with ECS Appraisal Form 400. Both instruments are part of the CASAS Employability Competency system and were developed, scaled, and normed according to CASAS' rigorous standards. The two instruments utilize a common scoring scale, enabling a combined analysis of the results.

Results from the ECS Appraisals (as well as other CASAS assessment instruments) are reported on a common, five-level scale, ranging from A (Pre-Literacy) to E (Advanced Adult Secondary), that reports learners' literacy levels within the context of employment and adult life skills. (See Table I.)

Table I - CASAS Basic Skills Levels

CASAS Level	Scaled Scores	Description
A	≤ 200	**Pre-Literacy:** Very limited ability to read or write. People at the upper end of this score range can read and write numbers and letters and simple words and phrases related to immediate needs. Can provide very basic personal identification in written form such as on job applications. Can handle routine entry-level jobs that require only basic written communication.
B	201 to 210	**Beginning Basic Skills:** Can fill out simple forms requiring basic personal information; write a simple list or telephone message; calculate a single simple operation when numbers are given; make simple change. Can read and interpret simple sentences on familiar topics. Can read and interpret simple directions, signs, maps, and simple menus. Can handle entry-level jobs that involve some simple written communication.
	211 to 220	**Intermediate Basic Skills:** Can handle basic reading, writing, and computational tasks related to their life roles. Can read and interpret simplified and some authentic materials on familiar topics. Can interpret simple charts, graphs, and labels; interpret a basic payroll stub; follow basic written instructions and diagrams. Can complete a simple order form and do calculations; fill out basic medical information forms and basic job applications; follow basic oral and written instructions and diagrams. Can handle jobs and/or job training that involve following basic oral or written instructions and diagrams if they can be clarified orally.
C	221 to 235	**Advanced Basic Skills:** Can handle most routine reading, writing, and computational tasks related to their life roles. Can interpret routine charts, graphs, and labels; read and interpret a simple handbook for employees; interpret a payroll stub; complete an order form and do calculations; compute tips; reconcile a bank statement; fill out medical information forms and job applications. Can follow multi-step diagrams and written instructions; maintain a family budget; write a simple accident or incident report. Can handle jobs and job training situations that involve following oral and simple written instructions and diagrams. Persons at the upper end of this score range are able to begin GED preparation.
D	236 to 245	**Adult Secondary:** Can read and follow multi-step directions; read and interpret common legal forms and manuals; use math in business, such as calculating discounts; create and use tables and graphs; communicate personal opinions in written form; write an accident or incident report. Can integrate information from multiple texts, charts, and graphs as well as evaluate and organize information. Can perform tasks that involve oral and written instructions in both familiar and unfamiliar situations.
E	246 +	**Advanced Adult Secondary:** With some assistance, people at this level are able to interpret technical information, more complex manuals, and materials safety data sheets (MSDS). Can comprehend some college textbooks and apprenticeship manuals.

CASAS, 1996

CASAS has a 15-year history of successfully assessing the basic skills of adults within a functional context and is used extensively throughout the United States in adult basic education, employment training, welfare reform, and workplace literacy programs. The CASAS system has been nationally validated and approved for national dissemination by the U.S. Department of Education's National Diffusion Network in the area of adult literacy. CASAS has also contributed its expertise to major state and national research projects as both a validated assessment system and an educational data collection and research organization.

The CASAS system's national validation is based on 15 years of assessment data from more than two million adult and youth learners. The numerical scale, with its corresponding competency descriptors, has become a standard means of reporting learning outcomes at local, state, and national levels.

In addition to reporting results on the CASAS scale, this study crosswalks the CASAS scale with one created for the 1993 *National Adult Literacy Survey (NALS)*. The NALS scale, based on a survey of more than 26,000 adults, classifies basic skills at five levels (1 to 5) along three scales: prose, document, and quantitative.

FINDINGS

The following are the key findings from the norming study:

Population Results

- The mean reading scaled score for the entire 819 subjects was 238, which is in the Level D score range. The mean math scaled score for the total population was 224, which is in the Level C score range. This pattern of higher reading than math skills is repeated when the percentage of individuals in each level is studied.
- The largest percentage (62%) of participants scored in Level D or E in reading, including 25 percent of all participants who scored in Level E. Very few (8%) scored in Level B or A in reading. In contrast, only 19 percent scored in Level D or E in math, while 38 percent scored in Level B or below. The highest percentage (43%) scored in Level C in math.

Program Results

- Of the 819 subjects, 291 were enrolled only in JTPA, 314 only in PROMISE JOBS, and 214 in both programs. JTPA participants scored higher in math and lower in reading than either the participants from the PROMISE JOBS program or participants involved in both programs.

Gender Results

- The study sample included 637 females and 173 males (nine individuals did not report gender). The mean reading score for females (238.6) was nearly four points higher than that for males (234.8).

Age Results

- Respondents' ages ranged from 14 to 75. The mean reading score of the 18 and younger age group was lower (at a statistically significant level) than that of all

other age groups except those who were 50 or older. There were no statistically significant differences among the reading scores for the 19 to 25, 26 to 29, and 30 to 39 year-old age groups. Participants who were 60 or older had lower reading scores (at a statistically significant level) than all except the 18 and younger age group. The mean math scores of those 19 to 25 years old were higher than those 18 and younger, and those 40 to 49.

Ethnicity Results

- The preponderance (84%) of the Iowa study population was White (non-Hispanic). Blacks (non-Hispanic) accounted for nine percent and Hispanics four percent of the population. In both reading and math, White (non-Hispanic) participants scored higher than both Black (non-Hispanic) and Hispanic participants; White (non-Hispanic) participants scored an average of nearly seven points higher than other ethnic groups in reading, and almost eight points higher in math.

Native Language Results

- The predominant native language of the participants was English, with more than 96 percent reporting this as their first language. The mean reading score for the native English speakers (238.0 - Level D) was nearly nine points higher than that of the non-native speakers (229.2 - Level C).
- There was no statistically significant difference between the mean math scores for native English speakers and non-native speakers (224.0 and 220.2 respectively).

Educational Level Results

- The highest educational grade completed by the participants ranged from one through 21. The most frequently reported highest grade completed was twelfth, which more than one-third of the participants selected. Eleven percent of participants completed 13 or more years of schooling, and 12 percent completed eight or fewer years.
- In general, a greater percentage of the participants who had completed more years of school scored higher in reading and math than those who had completed fewer years of school. Mean scaled scores in reading increased progressively as the highest grade completed increased, although there was no statistically significant difference between the mean reading scores of those who had completed nine and ten or ten and 11 years of schooling.
- The mean math score of those with ten years of education (224.1 - Level C) was higher than that of those with less previous education, but was not different (at a statistically significant level of .05) from the score of those who had completed 12 years of education (226.3 - Level C). Participants with 13 or more years of education had an average mean math score (233.6 - Level D) that was higher than that of any other group.
- Of the 819 participants in the Iowa study, almost half (46 percent) had not completed any degree. Approximately 45 percent had earned a high school diploma or its equivalency, and eight percent had earned another type of degree. Both reading and math mean scaled scores were consistently higher for those who had completed any degree than for those who had not.

APPLICATIONS

The results of this norming study can be used in a variety of ways, including:

- Reporting, when required, program results in terms of educational achievement;
- Predicting performance on the GED (General Educational Development);
- Establishing study programs for the GED;
- Measuring progress toward Iowa's Benchmarks for Adult Basic Education; and
- Conducting program planning, counseling, and referral.

Educational Achievement Reporting

Many agencies are required to report program results in terms of grade level equivalents (GLEs). The scaled scores developed and used by CASAS are more accurate for adults in life skills and employability programs, and more valuable for employers reviewing participants' skills than are grade level equivalents. To help these agencies meet their reporting requirements, this report compares the number of years of schooling Iowa's JTPA and PROMISE JOBS participants had completed with their scores on the CASAS ECS Appraisals. This comparison generates the information needed to report the grade level corresponding to particular CASAS test results. (See Table II.)

Table II - Relationship of CASAS Scores to Educational Achievement

Educational Achievement	CASAS Reading Score	CASAS Math Score
≤ 8 years of schooling	≤ 230	≤ 218
9 - 11 years of schooling	231 - 240	219 - 225
12 years of schooling, a high school diploma, or a GED	241 - 245	226 - 232
Vocational/technical training or some college	246 +	233 +

CASAS, 1996

GED Prediction

Two studies have been completed to determine the relationship between CASAS scaled scores and passing the GED. In 1986 and 1987, Rickard and Stiles (1987) collected data from instructors of GED preparation programs to determine the relationship between CASAS scaled scores and GED Practice Test scores. In 1995, Bakken conducted a study of incarcerated male youth to determine the level of prediction of performance on the GED by the ECS Appraisal Form 130. Both studies showed that CASAS assessment results were significant predictors of results on GED Practice Tests.

This norming study builds on the Bakken research to develop expectancy tables relating math and reading scores on the ECS Appraisal Form 130 to: 1) predicted average GED scores, 2) GED writing skills scores, 3) GED social studies scores, 4) GED science scores, 5) GED literature and the arts scores, and 6) GED math scores.

To pass the GED, Iowa currently requires that individuals obtain a minimum standard score of 35 on each of the five subject tests, and have an overall average standard score of 45. Effective January 1, 1997, individuals will have to score a minimum of 40 on each of the five subject tests to comply with the new minimal score requirements established by the Commission on Educational Credit and Credentials.

To have a better than 50/50 chance of meeting the average standard score requirement, individuals would have to have a reading score of *245 (Level D) or above* on the ECS Appraisal Form 130 assessment. Far lower reading scores on the ECS Appraisal, however, would suggest that individuals could meet the minimum scores for the five subject tests. A reading score of only *231 or above* would indicate that an individual would have a better than 50/50 chance of scoring a 40 or above on the writing, social studies, science, literature and the arts, or mathematics tests. (See Table III.)

Table III - Probability of Meeting GED Requirements by Performance on the ECS Form 130 Reading Appraisal

CASAS Level	ECS Form 130 Reading Appraisal Score	Probability of Meeting the Following GED Requirements:					
		Average Score (45)	Writing Score (40)	Social Studies Score (40)	Science Score (40)	Literature and the Arts Score (40)	Math Score (40)
A/B/C	≤ 230	6%	40%	34%	42%	32%	20%
	231 - 235	16%	71%	70%	78%	65%	55%
	236 - 240	22%	87%	72%	88%	85%	50%
D/E	241 - 244	46%	73%	80%	73%	73%	60%
	245 +	61%	76%	81%	87%	76%	71%

CASAS, 1996

A *math score* of 231 or above on the ECS Appraisal Form 130 assessment would also indicate that an individual would have a better than 50/50 chance at scoring a 40 or above on the GED math test. (See Table IV.)

Table IV - Probability of Meeting GED Requirements by Performance on the ECS Form 130 Math Appraisal

CASAS Level	ECS Form 130 Math Appraisal Score	Probability of Meeting Math Score Requirement (40)	Probability of Attaining Average Score Required over All GED Tests (45) on the Math GED Test
A/B/C	≤ 230	31%	12%
C/D/E	231 +	73%	43%

CASAS, 1996

While scores of 40 on each subject test would not result in a high enough overall average to pass the GED, individuals with lower than average scores on some subject tests could balance these with higher than average scores on other tests, and still pass the GED.

A 1995 American Council on Education (ACE) and Educational Testing Service (ETS) study compared *National Adult Literacy Survey (NALS)* scores to GED Test performance. This study found that higher scores on the NALS literacy assessments corresponded to higher scores on the GED Tests. Those who score above Level 1 on any of the NALS literacy scales have a better than 50/50 chance of passing the GED, while those who score above Level 2 have a better than 80/20 chance.

GED Study Guidelines

Individuals who score below 246 on the CASAS reading assessment or below 230 on the CASAS math assessment, or in Levels 1 or 2 on any of the NALS scales generally require some basic skills instruction in order to pass the GED. Experience over time, using CASAS assessments with similar populations, has shown that participants gain an average of five points after completing 100 hours of instruction. The following guidelines are provided based on this experience:

- Those who score 230 or below in reading are likely to require more than 300 hours of basic skills instruction, including GED preparation, in order to pass the GED.
- Those who score between 231 and 240 in reading are likely to require 100 to 300 hours of basic skills instruction, including GED preparation, in order to pass the GED.
- Those who score between 241 and 245 in reading are likely to need fewer than 100 hours of basic skills and GED preparation instruction in order to pass the GED.
- Those who score 230 or below in math are likely to require either short or long term basic skills instruction in math in order to pass the GED math section.
- Those who score 231 or higher in math may be ready to take the math subtest of the GED with limited or no preparation.

Measuring Progress toward Benchmarks

The published report entitled *Benchmarks for Adult Basic Education Programs in Iowa's Community Colleges* (1996) presents detailed benchmarks for measuring progress toward adult basic education program goals through the year 2005. The findings from this norming study can be used to help adult basic education programs in Iowa meet a number of their core benchmarks, specifically those related to educational gains, target populations, and basic skills instruction.

Educational Gains

- **Benchmark 2** - Percentage of adults 18 years and over who have attained a high school or equivalent diploma.
- **Benchmark 3** - Percentage of Iowa's GED candidates who pass the General Educational Development (GED) Examinations by Iowa state standards.

- **Benchmarks 6, 7, and 8** - Percentage of adults 16 years and over functioning at the five levels of Prose/Document/Quantitative Literacy.

A CASAS reading score of 241 or above, and a CASAS math score of 226 or above would indicate that an individual probably had the skills to attain a high school diploma. A CASAS reading score of 244 or above and a CASAS math score of 228 or above would indicate that an individual probably had the skills to attain a GED diploma and to function at NALS Level 3 or higher.

Target Populations

- **Benchmark 28** - The percentage of priority target population(s) served statewide
- **Benchmark 29** - The percentage of target population(s) completing or continuing in the program.

Iowa has identified six priority target populations for adult basic education and vocational training services. (Beder, 1995). These six groups are as follows:

- Persons for whom English is their second language **(ESL)** (1.4% of the Iowa adult population).
- Least educated school dropouts **(LoDRP)** who dropped out at grade ten or before (1.7% of the Iowa adult population).
- At-risk youth **(ARY)**, ages 16 to 21, who have not completed high school and are not currently enrolled in school (.6% of the Iowa population age 16 and over).
- Dropouts with relatively high educational **(HiDRP)** attainment who dropped out during eleventh grade (3.1% of the Iowa adult population).
- Able-bodied welfare recipients **(AWR)** (7.4% of the Iowa adult population and 75% of those receiving welfare in Iowa).
- Low-wage earners **(LWW)** who have not received public assistance (8.4% of the Iowa adult population).

Collectively, these priority target populations comprise 22.6 percent of Iowa's adult population.

Individuals for whom English is their second language are likely to score in Levels A, B, or C on the CASAS reading assessment and in Levels A or B on the CASAS math assessment. Dropouts with only ten or fewer years of schooling are likely to score in Levels A, B, or C on the CASAS reading assessment and the CASAS math assessment.

Welfare recipients, at-risk youth, and dropouts with more than ten years of schooling are likely to score in Level D on the CASAS reading assessment and Level C on the CASAS math assessment. There are no data on CASAS scores for low wage earners, but their likely NALS level suggests that they might score in Level E on the CASAS reading assessment and Levels C, D, or E on the CASAS math assessment.

These data suggest that most of Iowa's target populations would benefit from basic skills instruction, and confirm the need to include adult basic education instruction in any comprehensive delivery plan designed to assist them.

Basic Skills Instruction

- **Benchmark 1** - Percentage of adult basic education students whose educational progress will be measured in terms of competency based outcomes.
- **Benchmark 17** - Percentage of Iowa's ABE programs that have a method in place which correlates curriculum/instructional materials with assessed skills levels.
- **Benchmark 18** - Percentage of Iowa's ABE programs that, as evidenced by course outlines, target priority Iowa Adult Basic Skills Survey (IABSS) competencies in concert with basic skills.

The CASAS system helps programs to respond to Benchmark #1 by allowing students' progress to be measured in terms of competencies. Many of the competencies assessed using CASAS are the priority competencies identified in the IABSS study. These same competencies should be emphasized in instruction in order to meet the goal of Benchmark #18.

The *CASAS Curriculum Material Guide* helps instructors identify instructional resources that are linked to competencies and coded to skills levels. It provides a means to respond to Benchmark #17.

Program Planning, Counseling, and Referral

Agencies and policy makers can use the norms from this study to help shape programs and policies. Specifically, the norms can be used for:

- planning for block grants at the state and local level;
- developing descriptors that articulate basic skills functioning of adults in work, family, and community contexts;
- coordinating one stop planning teams to communicate basic skills outcomes across agency lines;
- defining student gains for policy, program, and legislative initiative planners;
- building individual student basic skills certification systems;
- implementing student portfolios;
- facilitating student movement across and through levels; and
- informing adult learners of educational progress.

Information from this study can also be used effectively by career counselors and other staff at one stop career centers and in other career counseling settings, including rehabilitation. The information provides clear outcome levels for:

- youth and adult basic education and job training programs;
- entry-level guidance for specific vocational training programs;
- guidelines for referrals to jobs and training;
- benchmarks for learners to help clarify their short-term and long-term career goals; and
- realistic information for employers to guide hiring decisions.

Tables V and VI combine CASAS levels and scores with information on NALS levels, education and degree attainment, and instructional requirements to help program

counselors and other staff make placements and referrals into basic skills and GED instruction based on a learner's assessed CASAS scaled scores.

Table V - Summary Reading Referral Guidelines

CASAS Level	CASAS Reading Score	Approximate NALS Level	Highest Education Level or Degree Completed	Estimated Basic Skills Instruction to Complete Level D*	GED Study Requirements
A/B/C	≤ 230	1	≤ 8	More than 300 hours	Not ready for GED preparation
C/D	231 - 240	2	9 - 11	100 - 300 hours	Ready to begin GED preparation
D	241 - 245	2	12th grade; high school; GED	Fewer than 100 hours	Ready to test in some areas based on GED Practice Test results; need limited GED preparation
E	246 +	3	Vocational/ technical training; some college	Additional specific basic skills instruction needed depends on educational goal	

* Estimate based on 5 points gain for 100 hours of instruction

CASAS, 1996

Table VI - Summary Math Referral Guidelines

CASAS Level	CASAS Math Score	Approximate NALS Level	Highest Education Level or Degree Completed	Estimated Basic Skills Instruction to Complete Level D	GED Study Requirements
A/B/C	≤ 230	1/2	12th grade; high school; GED	Short or long term	May be ready to begin GED preparation
C/D/E	231 +	3	Vocational/ technical training; some college	Limited or none	Ready to test; need limited GED preparation in math

CASAS, 1996

RECOMMENDATIONS

The results of this norming study provide policy makers and practitioners with a basis for advancing adult basic education practices in Iowa.

Recommendation One

The CASAS ECS appraisal instrument should be used in Iowa's Workforce Development Centers as the common appraisal instrument for gaining an initial indication of the functional literacy of the six priority populations targeted for adult basic education and vocational training services. The ECS Appraisal was the instrument

used with the norming study, and measures most of the priority basic skills competencies identified by the business and industry sector in the IABSS study.

Iowa adult education practitioners can use the CASAS appraisal to determine whether individuals need basic skills instruction, should be assessed in more detail, or are ready to move directly into vocational education or employment.

- A score of under 241 (Levels A, B, C, and part of D) in reading and under 231 (Levels A, B, and part of C) in math would identify those who should be referred to the community college adult education program for further evaluation and instruction.
- Reading scores between 241 and 245 (Level D), and math scores between 231 and 235 (Level C) would identify those individuals who should be assessed further and counseled about the best program of education and training for meeting their career goals.
- A score of 246 or above (CASAS Level E) on the reading and 236 or above (CASAS Levels D and E) on the mathematics section of the appraisal would identify those individuals whose literacy proficiency would enable them to function effectively in the workforce.

Recommendation Two

Iowa policy makers and adult education practitioners should use the information in this report to begin a dialogue on setting levels for granting certifications based on competency attainment of basic skills. The CASAS Levels A through E, presented in this report, provide a reasonable model for certification levels. Iowa's adult basic education program may want to adopt these levels as presented here, or modify them based on particular conditions and objectives in Iowa.

Recommendation Three

Further study should be done with individuals in the workplace, in order to determine the level of reading and math skills that is required for success. Such studies would serve to validate the cut-off scores established in the norming study.

Recommendation Four

Iowa policy makers and adult education practitioners should conduct research that would enable them to set certification levels in areas other than reading and mathematics, including communication, writing, and pre-employment skills.

SUMMARY

The three studies in the IABSS series provide a key to developing a high performance education and training system that can provide effective, targeted instruction, raise overall achievement, and provide new opportunities for all Iowans. (See page x for descriptions of these three studies.) These studies provide a clear direction for: 1) targeting resources, 2) focusing new curriculum development, 3) developing assessments

that directly measure high priority skills, and 4) ensuring clear accountability for programs and learners.

This third study provides a snapshot of JTPA and PROMISE JOBS participants and enhances understanding of the employment and basic skills needs of these members of Iowa's future workforce. It also contains critical information about the basic skills levels required for students to successfully pursue employment and further education and enter vocational/technical training programs. Counselors, instructors, and employers can use information from this study to make key training and employment decisions, including determining learners' and employees' needs for additional basic skills training.

The long range goal for Iowa's adult basic education program is to provide professional services, accountable to all stakeholders, that meet the changing needs of the state's adult learners within the existing community college adult basic education delivery system. The comprehensive research studies and data for moving toward this goal are now available. It's time to move from this strong research base to an action plan.

Chapter One: Overview of Iowa's JTPA and PROMISE JOBS Norming Study

INTRODUCTION

The long range goal for Iowa's adult basic education program is to provide professional services, accountable to all stakeholders, that meet the changing basic skills needs of the state's adult learners within the existing community college adult basic education delivery system. To this end, the Iowa Department of Education *completed* three major research initiatives in 1994. The first phase of adult basic skills research included the following studies:

- a study measuring the literacy levels of a representative sample of all adults in Iowa, the *Iowa State Adult Literacy Survey (IASALS);*
- a secondary analysis of the IASALS data; and
- the development of performance standards and indicators of program quality for Iowa's adult basic education program.

The second phase of studies *began* in 1994. Reflecting the increased importance being placed on the role of workforce preparation as an integral component of Iowa's economic development emphasis, these studies provide the foundation for a statewide adult basic education accountability system with a strong business and industry focus. This second phase consists of the following three research reports:

- *The Iowa Adult Basic Skills Survey (IABSS)* (April 1995) determined what basic skills were needed in the emerging workforce from the perspective of business and industry, job preparation providers, and adult learners.
- *Assessment of Basic Skills Competencies in Iowa's Employment and Workforce Programs* (November 1995) provided direction for assessment policy and practice in employability and workforce education and training programs serving youth and adults in Iowa.
- *A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations* is the current study (October 1996).

Information from the norming study provides critical information about the basic skills levels required for identified target populations to successfully pursue employment and further education (i.e., taking and passing the GED) and entering vocational/technical training programs. Basic skills norming information from this study can also be used by instructors, counselors, and employers to determine whether, and to what extent, individuals need basic skills instruction.

Participants in two federally funded programs, JTPA (Job Training Partnership Act) and JOBS (Job Opportunities and Basic Skills), were chosen as the study population. The objective of both JTPA and JOBS is to bring participants into unsubsidized and self-sustaining employment. In Iowa, the JOBS program is called PROMISE JOBS. JTPA and

PROMISE JOBS participants are eligible for basic skills training programs at Iowa community colleges as part of workforce training preparation to help them acquire the skills to obtain and maintain employment.

JTPA participants receive job related classroom and workplace experience provided through the Job Training Partnership Act.

PROMISE JOBS, first implemented in 1989, provides Family Investment Program (FIP) participants with the opportunity to become economically self-sufficient through expanded employment and training activities. Participants can make use of any or all of the following service components: 1) assessment, 2) job club, 3) work experience, 4) high school completion, 5) classroom training, and 6) mentor program pilot.

This snapshot of JTPA and PROMISE JOBS participants' basic skills levels further enhances understanding of the employment-related basic skills needs of these members of Iowa's current and future workforce.

IMPORTANCE OF THE STUDY

Adult Literacy Initiatives at the National Level

In recent years, the issue of adult literacy has become a growing national concern. Multiple studies have found an increasing gap between the level of literacy of adult Americans and the level of literacy required in both the workplace and in everyday life. Emerging technologies, work methods, and markets have greatly altered the types of skills required by adult workers, which then has an impact on job preparation programs.

The U.S. Departments of Education and Labor have both identified adult literacy related to employment as an area of major concern. Numerous studies have underscored the importance of this issue. In 1992, the Department of Labor (DOL) hired the Educational Testing Service to assess the literacy skills of Job Training Partnership Act and Employment Service/Unemployment Insurance program participants. The resulting study, *Beyond School Doors: The Literacy Needs of Job Seekers Served by the U.S. Department of Labor*, found that individuals in the DOL programs who demonstrate higher levels of literacy skills tend to avoid long periods of unemployment, earn higher wages, and work in higher level occupations than those participants who demonstrate lower literacy skills.

In 1993, the *National Adult Literacy Survey (NALS)*, funded by the U.S. Department of Education, measured the levels of literacy of a representative sample of adults. Although the majority of adults nationwide who performed at the lowest levels of literacy felt that they were able to meet most of the literacy demands they encountered, it is generally believed that these adults are condemned to low earning jobs with few choices (Carnevale, et al, 1990).

The Adult Basic Education Challenge in Iowa

The results of the NALS study further raised the level of concern for Iowa's own population. This resulted in special funding for the *Iowa State Adult Literacy Survey (IASALS)*, which surveyed approximately 1,250 adults representative of the state's population (Jenkins and Kirsch, 1994). The *NALS* and the *IASALS* were individually administered assessments that used performance on tasks encountered in everyday life to determine literacy levels. Although the levels of literacy in Iowa overall exceeded the national levels, the Iowa levels of literacy were similar to those in the other Midwestern states.

The IASALS findings indicated that 22 to 26 percent of Iowa's adult population lack basic workforce skills. Median incomes for the less literate were less than half of those at the highest literacy level. Also, literacy levels were markedly lower in populations that were poor or near poor.

These findings were consistent with an earlier study entitled *Iowa's Adult Education Programs: A Survey of Learner Demographics and Preliminary Skill Levels* (CASAS, 1993), in which more than half (58%) of the adult basic education participants' math scores indicated they would have difficulty with basic math in everyday situations (scored < 215 on the CASAS scale). Approximately one-fifth (21%) of the adult basic education participants' reading scores indicated they would have difficulty with basic reading in everyday situations (scored < 215 on the CASAS scale).

Using these and other studies as a conceptual framework, the Iowa Association of Adult and Continuing Education Deans and Directors prepared a policy position paper entitled *The Role of Community College Adult and Continuing Education in Iowa's Workforce Development Centers* (1996). This paper addresses the key role of Iowa's community college adult and continuing education divisions within the infrastructure of Iowa's Workforce Development Centers. One of the recommendations set forth called for a comprehensive assessment system that encompasses the entire range of assessment activities, from basic employability skills through job profiling. This recommendation is being implemented through a national study to determine the relationship between two nationally recognized and validated assessment systems: CASAS and Work Keys.

The norming study completes the sequence of second phase studies (discussed on page 1), building on the results of the prior two studies, and tying them together with a status report on the entry-level basic skills levels of participants in Iowa's JTPA and PROMISE JOBS programs.

GOALS AND OBJECTIVES OF THE STUDY

The overall purpose of the norming study, in conjunction with the first two studies in the series, is to provide the state of Iowa with the information it needs to establish a statewide adult basic education accountability system with a strong business and industry focus.

The first study, *The Iowa Adult Basic Skills Survey*, determined the basic skills needed in the workforce. The second study, *Assessment of Basic Skills Competencies in Iowa's Employment and Workforce Programs*, provided the tools for measuring individuals' abilities *vis-a-vis* these skills. This third and final study, *A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations*, provides instructors, counselors, and employers with information to determine whether individuals are job ready (i.e., possess the skills needed in the Iowa workforce) or need additional basic skills instruction.

The objectives of the norming study were to:

- Provide accurate and reliable norms that reflect the reading and math performance levels of Iowa's youth and adults engaged in workforce preparation and employment training for basic skills.
- Provide reference tables to show the relationship between:
  - CASAS scaled scores and educational levels; and
  - CASAS scaled scores and probable GED passing levels.
- Provide accurate and reliable information on score cut-off points to enable:
  - Learners to make important and realistic education and career decisions based on their own basic skills levels;
  - Instructors to plan training with learners, including determining the possible length of study time needed; and
  - Employers to make employment decisions and determine if their workforce needs additional basic skills training.
- Enable programs to report levels of educational functioning based on CASAS scaled scores for Iowa's Annual Performance Report for the Adult Education State-Administered Program.[1]
- Collect the necessary data about reading and math skills levels for future development of a customized Iowa appraisal instrument to assess competency areas identified by the *Iowa Adult Basic Skills Survey (IABSS)*.
- Develop a preliminary database for all agencies involved in employability basic skills assessment and/or instruction.

[1]CASAS' new electronic TOPS (Tracking of Programs and Students) system can be used to monitor learner progress, track learner results, guide instruction, document competency attainment, and ensure program accountability.

Chapter Two: Methodology and Instrumentation

METHODOLOGY

Sampling

A Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations included participants from JTPA and PROMISE JOBS programs from 11 of the 15 Iowa community college districts. Letters were sent to the adult basic education coordinators at all 15 of Iowa's community colleges inviting participation in the study. Eleven positive responses were received. Information about participants in this study was collected as a self report from the subjects' answer forms.

Data Collection Procedures

Materials distributed to participating sites included test booklets, answer forms, and guidelines for completing background information, following testing procedures, and returning answer sheets. All personnel involved in the administration of the Employability Competency System (ECS) Appraisals were trained in proper test procedures. Testing was completed between November of 1994 and June of 1995 and the answer sheets were returned to CASAS for electronic scoring.

Study Response

All participants were from 11 of the 15 community colleges throughout the state and were participants in various job preparation programs. The numbers of participants per site ranged from 15 at Northwest Iowa Technical College to 147 at Indian Hills Community College. (See Table 1.)

Table 1 - Iowa's JTPA and PROMISE JOBS Participants by Site

Community College District Number	Community College Site	Number	Percentage
I.	Northeast Iowa Community College	95	12%
II.	North Iowa Area Community College	128	16%
IV.	Northwest Iowa Community College	15	2%
VI	Iowa Valley Community College District	78	10%
IX.	Eastern Iowa Community College District	96	12%
X.	Kirkwood Community College	24	3%
XI.	Des Moines Area Community College	40	5%
XII.	Western Iowa Tech Community College	49	6%
XIII.	Iowa Western Community College	114	14%
XV.	Indian Hills Community College	147	18%
XVI.	Southeastern Community College	33	4%
	Total	**819**	**100%**

CASAS, 1996

INSTRUMENTATION

CASAS Employability Competency System (ECS) Appraisals

In 1992, there was a national shift in emphasis in JTPA programs to basic skills acquisition coupled with instruction in employment competencies. The ECS Appraisal Series supported this new approach (CASAS, 1994). CASAS Employability Competency System (ECS) Appraisal Form 130 and Form 400 are assessment instruments developed by the Comprehensive Adult Student Assessment System (CASAS). These appraisals are part of an integrated system that provides learner-centered curriculum management, assessment, and evaluation for:

- education systems;
- vocational preparation programs; and
- business and industry basic skills training programs in both the public and private sectors.

The CASAS Employability Competency System (ECS) Appraisal Form 130 was developed and released in October 1995 to expand the Employability Competency Series. The form and format parallels prior CASAS instruments such as the ECS Form 400. (See Appendices A, B, and C for more information on CASAS assessments and ECS Appraisal Form 130.)

Participants in the *Workforce Basic Skills Norming Study of Iowa's JTPA and PROMISE JOBS Target Populations* were administered the CASAS *Employability Competency System*

(ECS) Appraisals. Ten of the community college sites used the Employability Competency System (ECS) Appraisal Form 130, while one site used the Employability Competency System Appraisal Form 400, which was already in use at that site. Both of these instruments are part of the CASAS Employability Competency System and were developed, scaled, and normed according to CASAS' rigorous standards. The instruments use a common scoring scale, enabling a combined analysis of the results.

Of the 819 subjects involved in this study, 705 completed the CASAS Extended ECS Appraisal Form 130 (86%) while the remaining 114 completed CASAS ECS Appraisal Form 400 (14%). (See Table 2.) Those completing Form 400 were exclusively from the Iowa Western Community College district. The Form 130 subjects were enrolled in the other ten community college districts that participated in this study.

Table 2 - Iowa Population by Instrument

Instrument	Number	Percentage
Form 130	705	86%
Form 400	114	14%
Total	**819**	**100%**

CASAS, 1996

Employability Competency System (ECS) Competencies

The competencies, assessed with the CASAS Employability Competency System (ECS) Appraisal Series, are illustrated in Table 3. The two digit numbers refer to the CASAS Competency Areas. The diamonds (◇) indicate that items assess a skill identified in *The Iowa Adult Basic Skills Survey (IABSS)* as either a "top priority" or a "high priority" by the aggregate populations of IABSS respondents (CASAS, 1995).[2] These assessment instruments were selected because of the high correlation between their content and Iowa's priority competencies.

[2]The IABSS study collected information from 3,483 individuals representing ABE/ESL/GED instructional staff, community agency contact persons, private industry councils, participatory planning committees, business and industry, other literacy partners, and other interested parties. These individuals rated the importance of 55 competencies on a scale of 1 (not important) to 4 (very important).

Table 3 - CASAS ECS Appraisal Competencies and Iowa's Top Priority Competencies

ECS Appraisal Competencies	Iowa Top 30
1.1 Use weights, measures, measurement scales, and money.	◇
1.3 Understand methods and procedures used to purchase goods and services.	◇
1.5 Apply principles of budgeting in the management of money.	◇
2.1 Use the telephone and telephone book.	◇
2.3 Understand concepts of time and weather.	◇
3.2 Understand medical and dental forms and related information.	◇
3.4 Understand basic health and safety procedures.	◇
3.5 Understand basic principles of health maintenance.	◇
4.1 Understand basic principles of getting a job.	◇
4.2 Understand wages, benefits, and concepts of employee organizations.	◇
4.4 Understand concepts and materials related to job performance and training.	◇
6.1 Compute using whole numbers.	◇
6.2 Compute using decimal fractions.	◇
6.3 Compute using fractions.	
6.8 Use statistics and probability.	
7.2 Demonstrate ability to use thinking skills.	◇
7.3 Use problem solving skills.	◇

◇ These competencies are included in Iowa's Top 30 Priority Areas

CASAS, 1996

CASAS Scaled Score Ranges and Level Descriptions

CASAS has a 15-year history of successfully assessing the basic skills of adults within a functional context and is used extensively throughout the United States in adult basic education, employment training, welfare reform, and workplace literacy programs. The CASAS system has been nationally validated and approved for national dissemination by the U.S. Department of Education's National Diffusion Network in the area of adult literacy. CASAS has also contributed its expertise to major state and national research projects as both a validated assessment system and an educational data collection and research organization.

The CASAS system's national validation is based on 15 years of assessment data from more than two million adult and youth learners. Results from many CASAS assessment instruments, including the ECS Appraisal, are reported on a common scale. This

numerical scale, with its corresponding competency descriptors, has become a standard means of reporting learning outcomes at local, state, and national levels. Instructors and program planners can use the scale with confidence to compare their learners' literacy skills with learners from throughout the country.

The CASAS scale has been divided into five levels, A (Pre-Literacy) to E (Advanced Adult Secondary), each encompassing a range of scores. CASAS scaled scores report learners' literacy levels within employment and adult life skills contexts. Table 4 describes performance at each of the five basic skills levels.

The score descriptions and ranges have been developed collaboratively from data drawn from a consortium of:

- state and local governments;
- education systems;
- workforce development systems;
- welfare organizations;
- public interest groups;
- community colleges and universities;
- vocational education systems;
- employers;
- correctional systems; and
- other organizations invested in education and employability.

Table 4 - CASAS Basic Skills Levels

CASAS Level	Scaled Scores	Description
A	≤ 200	**Pre-Literacy:** Very limited ability to read or write. People at the upper end of this score range can read and write numbers and letters and simple words and phrases related to immediate needs. Can provide very basic personal identification in written form such as on job applications. Can handle routine entry-level jobs that require only basic written communication.
B	201 to 210	**Beginning Basic Skills:** Can fill out simple forms requiring basic personal information; write a simple list or telephone message; calculate a single simple operation when numbers are given; make simple change. Can read and interpret simple sentences on familiar topics. Can read and interpret simple directions, signs, maps, and simple menus. Can handle entry-level jobs that involve some simple written communication.
	211 to 220	**Intermediate Basic Skills:** Can handle basic reading, writing, and computational tasks related to their life roles. Can read and interpret simplified and some authentic materials on familiar topics. Can interpret simple charts, graphs, and labels; interpret a basic payroll stub; follow basic written instructions and diagrams. Can complete a simple order form and do calculations; fill out basic medical information forms and basic job applications; follow basic oral and written instructions and diagrams. Can handle jobs and/or job training that involve following basic oral or written instructions and diagrams if they can be clarified orally.
C	221 to 235	**Advanced Basic Skills:** Can handle most routine reading, writing, and computational tasks related to their life roles. Can interpret routine charts, graphs, and labels; read and interpret a simple handbook for employees; interpret a payroll stub; complete an order form and do calculations; compute tips; reconcile a bank statement; fill out medical information forms and job applications. Can follow multi-step diagrams and written instructions; maintain a family budget; write a simple accident or incident report. Can handle jobs and job training situations that involve following oral and simple written instructions and diagrams. Persons at the upper end of this score range are able to begin GED preparation.
D	236 to 245	**Adult Secondary:** Can read and follow multi-step directions; read and interpret common legal forms and manuals; use math in business, such as calculating discounts; create and use tables and graphs; communicate personal opinions in written form; write an accident or incident report. Can integrate information from multiple texts, charts, and graphs as well as evaluate and organize information. Can perform tasks that involve oral and written instructions in both familiar and unfamiliar situations.
E	246 +	**Advanced Adult Secondary:** With some assistance, people at this level are able to interpret technical information, more complex manuals, and materials safety data sheets (MSDS). Can comprehend some college textbooks and apprenticeship manuals.

CASAS, 1996

Level A will not be shown throughout the rest of this report, because only a very small percentage of those tested in the Iowa JTPA and PROMISE JOBS programs scored in that range.

Indicators of Workforce Basic Skills

Tables 5 and 6 contain concrete *examples* of workforce basic skills that learners can demonstrate at each level for reading and math. The examples, or skills indicators, are based on ECS appraisal test data from JTPA and PROMISE JOBS participants in this study.

These skills indicators illustrate the basic skills of learners in each score range. They expand the descriptions found in Table 4, providing more concrete examples of a person's reading and math skills, based on test data. For purposes of this study, a skills indicator has been assigned to a score range when 75 percent of those in the score range are able to respond correctly to items assessing that basic skill. Therefore, a person whose reading test score falls within the 236 to 245 range would probably be able to "Identify specific information about previous employment on the work history section of a job application form." In math, a person whose score falls within the 221 to 235 range would probably be able to "Determine the number of hours and minutes from one clock time to another." A person could score in one range for reading and a different range for math.

Table 5 - Reading Indicators of Workforce Basic Skills

Learners at this level...	who scored in this range...	demonstrated these basic reading skills:
B	≤ 220	Read the monthly service charge and the total amount due on a telephone bill. Interpret from a job ad whether to apply in person, by phone, or in writing.
C	221 - 235	Interpret nutritional information on a food label (e.g., the percentage of necessary vitamins per serving). Respond to basic questions on a medical history form.
D	236 - 245	Identify specific information about previous employment on the work history section of a job application form. Interpret job descriptions to infer the type of work schedule involved.
E	246 +	Interpret a sales staff work schedule to determine where, when, and how to reach someone. Interpret a technical term in an employment-related government report.

CASAS, 1996

Table 6 - Math Indicators of Workforce Basic Skills

Learners at this level...	who scored in this range...	demonstrated these basic math skills:
𝔹	≤ 220	Measure the length of an object in millimeters. Calculate the length of a work break from a time card showing starting and ending work times.
ℂ	221 - 235	Calculate the average daily number of customers for a week. Determine the number of hours and minutes from one clock time to another.
𝔻	236 - 245	Compare dollar amounts on a pay stub to determine what percent net pay is of gross pay. Interpret a bar graph to determine percent differences between categories.
𝔼	246 +	On a scale drawing, use proportions to determine the actual height of a house. Compute the sales tax on the purchase of a specified number of items.

CASAS, 1996

NATIONAL ADULT LITERACY SURVEY (NALS) LITERACY LEVELS

Another scale of literacy skills in common use today is one created for the 1993 *National Adult Literacy Survey (NALS)*.[3] The NALS surveyed over 26,000 adults, and classified their basic skills at five levels (1 to 5) along the following three scales:

- **Prose** - The knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and fiction.
- **Document** - The knowledge and skills required to locate and use information contained in materials that include job applications, payroll forms, transportation schedules, maps, tables, and graphs.
- **Quantitative** - The knowledge and skills required to apply arithmetic operations, either alone or sequentially, using numbers embedded in printed materials (Jenkins, et al, 1995).

Because the norming study compares scores on the CASAS assessments to the NALS levels, these scales are presented in Table 7.

[3]For further information on the National Adult Literacy Survey, consult Irwin S. Kirsch, et. al. *Adult Literacy in America: A First Look at the Results of the National Adult Literacy Survey*. Washington, DC: National Center for Education Statistics, 1993.

Table 7 - Descriptions of the NALS Literacy Levels*

NALS Literacy Level Score Range	Prose Literacy Scale	Document Literacy Scale	Quantitative Literacy Scale
Level 1 (0 to 225)	Read short text to locate a single piece of easily identifiable information.	Locate a piece of information based on a literal match; enter personal information into a document.	Perform single, simple arithmetic operations, such as addition, using provided numbers and specified operations.
Level 2 (226 to 275)	Locate a single piece of information with distractors present; make low-level inferences; compare and contrast easily identifiable information.	Match a single piece of information, with distractors present; make low-level inferences; cycle through information or integrate data from parts of a document.	Perform a single operation using numbers provided or easily located; determine the operation to be performed from the format of the material.
Level 3 (276 to 325)	Match literal information in the text; make low-level inferences; integrate information from lengthy text; generate a response based on easily identifiable information.	Integrate multiple pieces of information from one or more documents; cycle through complex data or graphs which contain irrelevant information.	Locate two or more numbers in material; determine arithmetic operation from terms used in the task.
Level 4 (326 to 375)	Perform multiple feature matches of information; integrate or synthesize information from complex or lengthy passages; make complex inferences.	Perform multiple feature matches; cycle through documents; integrate information; make higher levels of inference.	Perform two or more sequential operations; use quantities found in different displays; infer operations from information provided or prior knowledge.
Level 5 (376 to 500)	Search for information in dense text; make high-level inferences; use background knowledge; contrast complex information.	Search through complex displays that contain multiple distractors; make high level, text-based inferences; use specialized knowledge.	Perform multiple operations sequentially; disembed features of problem from text; use background knowledge to determine quantities or operations needed.

*J. Baldwin, et al. *The Literacy Proficiencies of GED Examiness: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Refer to Figure 1.1, p. 14.

Chapter Three: Reading and Math Performance Level Norming Study Findings

IOWA STUDY POPULATION RESULTS

The reading and math performance level findings of this norming study are presented in the following sections. Analyses of program type, gender, age, ethnicity, and native language are also presented in this chapter.

There were 819 subjects in the Iowa study, 705 who completed CASAS ECS Form 130 and 114 who completed ECS Form 400. The mean reading scaled score for the total population was 238, which is in the Level D score range (Adult Secondary Level). (See Tables 4 and 5.) The mean math scaled score for the total population was 224, which is in the Level C score range (Advanced Basic Skills). (See Tables 4 and 6.) The difference between the mean reading and math scores was statistically significant at the .05 level. Table 8 presents mean scaled scores for reading and math for the total population.

Table 8 - Iowa Population Mean CASAS Scaled Scores

Reading	Math	Number of Individuals
238	224	819

CASAS, 1996

The number and percentage of Iowa participants scoring within each CASAS reading level are shown in Table 9. The number and percentage of Iowa participants scoring within each CASAS math level are shown in Table 10.

The largest percentage of participants (62%) scored in Level D or E in reading, including 25 percent of all participants who scored in Level E. Very few (8%) scored in Level B or Level A (below 220) in reading.

In contrast, only 19 percent scored in Level D or E in math, while 38 percent scored in Level B or below. The highest percentage (43%) scored in Level C in math.

Table 9 - Iowa Population by Grouped ECS Reading Scores

CASAS Level	Reading Score	Number	Percent
B	≤ 220	66	8%
C	221 - 235	244	30%
D	236 - 245	302	37%
E	246 +	207	25%
	Total	**819**	**100%**

CASAS, 1996

Table 10 - Iowa Population by Grouped ECS Math Scores

CASAS Level	Math Score	Number	Percent
B	≤ 220	312	38%
C	221 - 235	349	43%
D	236 - 245	119	14%
E	246 +	39	5%
	Total	**819**	**100%**

CASAS, 1996

Program Type Results

Three program categories were identified based on participant enrollment: 1) JTPA, 2) PROMISE JOBS, and 3) both JTPA and PROMISE JOBS. There were 291 participants enrolled only in JTPA, 314 enrolled only in PROMISE JOBS, and 214 enrolled in both programs. Using combined totals, 505 of the participants were enrolled in JTPA programs while 528 were enrolled in PROMISE JOBS. Table 11 reflects the numbers and percentages of participants in these three program groupings, along with their mean scaled scores.

There was variation among the scaled scores for different program types. JTPA participants scored higher in math and lower in reading than either the participants from the PROMISE JOBS program or participants involved in both programs. These results were statistically significant at the .05 level. (See Appendix D for standard deviations and tables of significance.) It is likely that PROMISE JOBS participants outscored JTPA participants in reading because there is a higher percentage of females in PROMISE JOBS than in JTPA, and, as reported in the next section, females outscore males in reading.

Table 11 - Iowa Population Mean Scaled Scores by Program Type

Program Type	Number	Percentage	Reading	Math
JTPA	291	36%	235.8	225.8
PROMISE JOBS	314	38%	238.5	222.3
Both	214	26%	238.9	223.5
Total	**819**	**100%**	**237.6**	**223.9**

CASAS, 1996

Gender Results

The subjects in the study included 173 males, 637 females, and nine subjects who failed to complete the gender portion of the answer form. (See Table 12.) This resulted in approximately 21 percent male subjects and 78 percent female, with one percent missing.

There was a statistically significant difference (at the .05 level) of approximately four points between the mean scaled score in reading for females and males, with females scoring higher than males. The difference in the math results for males and females was not statistically significant at the .05 level. (See Appendix D for standard deviations and tables of significance.)

Table 12 - Iowa Population Mean Scaled Scores by Gender

Gender	Number	Percentage	Reading	Math
Male	173	21%	234.8	224.9
Female	637	78%	238.6	223.6
Missing	9	1%		
Total	**819**	**100%**	**237.7**	**223.9**

CASAS, 1996

Age Results

Age varied widely across the Iowa participants, ranging from 14 to 75 with 13 individuals not completing the age block on the answer form. Table 13 shows the number and percentages of the grouped ages of the Iowa population, along with their mean scaled scores.

The mean reading score of the 18 and below age group was lower (at a statistically significant level of .05) than that of all other age groups except those who were 50 or older. There was no statistically significant difference among the reading scores for the 19 to 25, 26 to 29, and 30 to 39 year-old age groups. Participants who were 60 or older scored lower in reading (at a statistically significant level of .05) than all except the youngest age group.

There were only two statistically significant differences (to the .05 level) in mean math scores. Those in the 19 to 25 age range scored higher (225.6) than those who were 18 or younger (221.9). The 19 to 25 year olds also scored higher than the 40 to 49 age group (221.8). For all other age groups, the differences in the mean math scores were not statistically significant. (See Appendix D for standard deviations and tables of significance.)

Table 13 - Iowa Population Mean Scaled Scores by Age

Age	Number	Percentage	Reading	Math
≤ 18	145	18%	231.3	221.9
19 - 25	232	28%	240.8	225.6
26 - 29	121	15%	240.1	224.3
30 - 39	203	25%	239.3	224.3
40 - 49	61	7%	236.0	221.8
50 - 59	20	2%	234.8	223.8
60 +	24	3%	226.5	222.1
Missing	13	2%		
Total	**819**	**100%**	**237.7**	**224.0**

CASAS, 1996

Ethnicity Results

The preponderance of this Iowa study population was White (non-Hispanic). (See Tables 14 and 15.) Almost 700 of the 819 subjects, or 84 percent, marked this category on the answer form. Black (non-Hispanic) was the next highest group with 70 participants, which accounted for about nine percent of the population. Approximately four percent of the participants were Hispanic, with two percent reporting other ethnic backgrounds. In addition, there were eight participants who failed to complete this item.

Reading and math mean scaled scores by ethnicity for the total population are presented in Table 14, while Table 15 displays the mean scaled scores of groupings by ethnicity that have been further aggregated in order to highlight the difference between the White and non-White populations. In both reading and math, White (non-Hispanic) participants scored higher than both Black (non-Hispanic) and Hispanic participants, and these differences were statistically significant to the .05 level. White (non-Hispanic) participants scored an average of nearly seven points higher than other ethnic groups in reading, and almost eight points higher in math. There were no statistically significant differences between the scores of the Black and the Hispanic groups. (See Appendix D for standard deviations and tables of significance.)

Table 14 - Iowa Population Mean Scaled Scores by Ethnicity

Ethnicity	Number	Percentage	Reading	Math
White (Non-Hispanic)	688	84%	238.7	225.1
Black (Non-Hispanic)	70	9%	231.0	215.4
Hispanic	34	4%	230.6	217.6
Other	19	2%	237.4	223.2
Missing	8	1%		
Total	**819**	**100%**	**237.7**	**223.9**

CASAS, 1996

Table 15 - Iowa Population Mean Scaled Scores by Aggregated Ethnic Groups

Ethnicity	Number	Percentage	Reading	Math
White (Non-Hispanic)	688	84%	238.7	225.1
All Other Groups	123	15%	231.9	217.2
Missing	8	1%		
Total	**819**	**100%**	**237.7**	**223.9**

CASAS, 1996

Native Language Results

The predominant native language of the participants was English, with more than 96 percent reporting this as their first language. This resulted in approximately three percent indicating a language other than English as their native language. Eleven participants did not complete this item on the answer form. (See Table 16.)

Table 16 also shows the reading and math mean scaled scores of native English speakers as compared to an aggregation of the non-native English speaker subgroups. The mean reading score for the native English speakers (238) was nearly nine points higher than that of the non-native speakers (229.2). This difference was statistically significant (at the .05 level) even though only 21 participants in the sample were non-native speakers of English. There was no statistically significant difference between the mean math scores for these two groups. (See Appendix D for standard deviations and tables of significance.)

Table 16 - Iowa Population Mean Scaled Scores by Aggregated Native Language

Native Language	Number	Percentage	Reading	Math
English	787	96%	238.0	224.0
Other	21	3%	229.2	220.2
Missing	11	1%		
Total	819	100%	237.8	223.9

CASAS, 1996

SUMMARY OF READING AND MATH FINDINGS

The following points summarize the reading, math, and demographic findings presented in this chapter of the report.

Reading and Math Results

- Overall, the math skills of Iowa's JTPA and PROMISE JOBS populations were lower than their reading skills.
- The mean reading scaled score for the total population was 238, which is in the Level D score range (Adult Secondary Level).
- The largest percentage of participants scored in Level D or E (62%) in reading, including 25 percent of all participants who scored in Level E. Very few (8%) scored in Level B or Level A (below 220) in reading.
- The mean math scaled score for the total population was 224, which is in the Level C score range (Advanced Basic Skills).
- In contrast, only 19 percent scored in Level D or E in math, while 38 percent scored in Level B or below. The highest percentage (43%) scored in Level C in math.

Demographic Profile and Results

- Five hundred five of the participants were enrolled in JTPA programs while 528 were enrolled in PROMISE JOBS. (This includes a double count of 214 participants enrolled in both JTPA and PROMISE JOBS.)
- JTPA participants scored higher in math and lower in reading than either the participants from the PROMISE JOBS program or participants involved in both programs.
- There were approximately 21 percent male subjects and 78 percent female subjects in the study population.
- There was approximately a four point difference between the mean scaled score in reading for females (238.6) and males (234.8), with females scoring higher than males.
- Age varied widely across the Iowa participants, ranging from 14 to 75.
- The mean reading score of the 18 and below age group was lower (at a statistically significant level) than that of all other age groups except those who were 50 or older. There was no statistically significant difference among the reading scores for the 19 to 25, 26 to 29, and 30 to 39 year-old age groups.

Participants who were 60 or older scored lower in reading (at a statistically significant level) than all except the youngest age group.

- Those in the 19 to 25 age range scored higher in math (225.6) than those who were 18 or younger (221.9). The 19 to 25 year olds also scored higher in math than the 40 to 49 age group (221.8). All other age groups had similar mean math scores.
- The preponderance (84%) of this Iowa study population was White (non-Hispanic). Black (non-Hispanic) accounted for about nine percent, and approximately four percent were Hispanic.
- In both reading and math, White (non-Hispanic) participants scored higher than both Black (non-Hispanic) and Hispanic participants.
- Approximately three percent of the study sample indicated a language other than English as their native language.
- The mean reading score for the native English speakers (238.0) was nearly nine points higher than that of the non-native speakers (229.2).

Chapter Four: Educational Level Data Norming Study Findings

INTRODUCTION

CASAS uses scaled score ranges to describe levels of functional literacy within an employment context that range from "Pre-Literacy" through "Advanced Adult Secondary." (See Table 4.) The CASAS descriptors for these levels help programs interpret CASAS scaled scores and determine whether their learners have the skills they need for the particular goals they are trying to achieve.

Scaled scores and functional descriptors are more valuable than grade level equivalents (GLEs) for a number of reasons.

- Tests used for the purpose of reporting out GLEs are not precise measures of what a person can do. They only show how examinees compare to a norm group that, in most cases, is not a valid comparison group for the purposes of workforce basic skills. In addition, such tests often measure only academic skills. Basic skills for the workplace are better measured in the context of functional employment.
- There is no set of basic skills universally used in norm referenced tests reporting out grade level equivalents (GLEs); therefore, scores from different reading tests are difficult to compare.
- Grade levels are not precise equivalents either within or across educational systems.
- Readability formulas that are used to determine the difficulty level of grade-level tests employ mechanical measures, including word or sentence length, grammatical relationships, and commonness of sentence patterns. Such measures do not take into account an adult learner's work and other experiences, nor do they consider the diverse cultural backgrounds of learners. Consequently, different readability formulas applied to the same reading passage result in different grade level equivalents.
- Grade-level tests are designed to place learners in typical textbook courses of study used in grades 1 through 12, which makes the content of these tests much less valid for adults and special populations in employability programs.
- Grade-level tests do not relate to appropriate curricula nor to typical vocabulary, reading materials, language skills, and mathematical problems encountered in an employment setting or in everyday life.
- Finally, adult learners' scores on grade-level tests are compared to the scores of student "norm groups" in elementary grades, which render them less valid for adults of all ages.

While scaled scores are both more valuable and more accurate than grade level equivalents, many agencies are required to report program results in terms of educational grade levels. To help these agencies meet their reporting requirements, CASAS compared the number of years of schooling Iowa's JTPA and PROMISE JOBS participants had

completed with their scores on the CASAS ECS Appraisals. The resulting reference tables (Tables 17 through 19) can be used to report the grade level corresponding to particular CASAS test results.

HIGHEST EDUCATIONAL GRADE COMPLETED

The highest educational grade completed by the participants ranged from grades one through 21. (See Table 17.) The most frequently reported category was grade 12, which included more than one-third of the participants. There were 86 participants who completed 13 or more years of schooling, accounting for 11 percent of the population. Twelve percent completed eight or fewer years of schooling. Approximately one percent of the population failed to complete this item on the answer form.

The reading and math mean scaled scores for the Iowa population are also shown in Table 17. Mean scaled scores increased progressively in reading as the highest grade completed increased, although there was no statistically significant difference between the mean reading scores of those who had completed nine and ten or ten and 11 years of schooling. (See Appendix D for standard deviations and tables of significance.)

The math mean scaled scores presented a different pattern. There was no statistically significant difference between the scores of those who had completed eight or fewer years and those who had completed nine years of education. The mean math score of those with ten years of education (224.1) was higher than that of individuals with less previous education, with the difference being statistically significant to the .05 level. There was no statistically significant difference in the mean math scores of those with ten years of education and those who had completed 12 years of education (226.3). Participants with 13 or more years of education had an average mean math score that was higher (233.6) than any other group, and this difference was statistically significant to the .05 level.

An unusual finding in this study was that the mean math scaled score of participants who had completed 11 years of schooling (220.7) was lower than that of those who had completed ten years of school, and this difference was statistically significant to the .05 level. Further analysis of the 118 participants who had completed 11 years of previous education indicated that there were: 1) more who were in PROMISE JOBS, 2) more who were non-White, and 3) twice as many who had not completed any degree. With respect to their age, there were fewer who were 18 or younger and more in the 19 to 29 age range than in the rest of the study sample.

Tables 18 and 19 further split the reading and math scores by highest grade completed for the Iowa population. In general, a greater percentage of participants who had completed more years of school scored higher in reading and math than those who had completed fewer years of school.

Table 17 - Iowa Population Mean Scaled Scores by Highest Grade Completed

Highest Grade Completed	Number	Percentage	Reading	Math
≤ 8	97	12%	229.1	217.4
9	107	13%	233.2	219.1
10	114	14%	235.8	224.1
11	118	14%	237.0	220.7
12	288	35%	241.2	226.3
13 +	86	11%	245.7	233.6
Missing	9	1%		
Total	**819**	**100%**	**237.8**	**223.9**

CASAS, 1996

Table 18 - Percentage of Iowa Learners Scoring in ECS Reading Levels by Highest Grade Completed

Highest Grade Completed	Reading Scores			
	B	C	D	E
	≤ 220	221 - 235	236 - 245	246 +
≤ 8	25%	39%	28%	8%
9	11%	45%	32%	12%
10	6%	39%	39%	16%
11	4%	31%	48%	16%
12	4%	22%	38%	35%
13 +	2%	10%	32%	55%

CASAS, 1996

Table 19 - Percentage of Iowa Learners Scoring in ECS Math Levels by Highest Grade Completed

Highest Grade Completed	Math Scores			
	B	C	D	E
	≤ 220	221 - 235	236 - 245	246 +
≤ 8	62%	34%	4%	0%
9	56%	31%	12%	1%
10	38%	42%	16%	4%
11	44%	47%	8%	1%
12	28%	51%	15%	6%
13 +	13%	35%	36%	16%

CASAS, 1996

HIGHEST DEGREE COMPLETED

Of the 819 participants in the Iowa study, almost half (46 percent) had not completed any degree. (See Tables 20 and 21.) Approximately 45 percent had earned a high school diploma or its equivalency, and eight percent had earned another type of degree. Three percent of the participants left this item incomplete on the answer form.

Mean scaled scores for both reading and math were consistently higher, at a statistically significant level of .05, for those who completed any degree than for those who had not. High school graduates and GED (General Educational Development) recipients scored lower than advanced degree holders in both reading and math. (See Table 20.) (See Appendix D for standard deviations and tables of significance.)

Table 20 - Iowa Population Mean Scaled Scores by Type of Degree Completed

Type of Degree Completed	Number	Percentage	Reading	Math
None	380	46%	232.9	219.5
High School	239	30%	240.6	226.4
GED	121	15%	243.9	228.7
Vocational/Technical	21	3%	246.0	233.2
AA	13	2%	248.9	234.3
Other	22	3%	241.1	231.9
Missing	23	3%		
Total	796	100%		

CASAS, 1996

Table 21 - Iowa Population Mean Scaled Scores by Degree Completion

Degree Completion	Number	Percentage	Reading	Math
None	380	46%	232.9	219.5
Completed	416	54%	242.1	228.0
Missing	23	3%		
Total	**796**	**100%**	**237.7**	**223.9**

CASAS, 1996

SUMMARY OF EDUCATIONAL LEVEL AND HIGHEST DEGREE FINDINGS

The following points summarize the educational level and highest degree findings presented in this chapter of the report.

Highest Grade Completed

- In general, participants who had completed more years of school scored higher in reading and math.
- The most frequently reported category of grade completion was grade 12, which included more than one-third (35%) of the participants. There were 86 participants (11%) who completed 13 or more years of schooling. Twelve percent completed eight or fewer years of schooling.
- Mean scaled scores increased progressively in reading as the highest grade completed increased, although there were no statistically significant differences between the mean reading scores of those who had completed nine and ten or ten and 11 years of schooling.
- The mean math score of those with ten years of education (224.1) was higher than that of individuals with less previous education. Participants with 13 or more years of education had an average mean math score (233.6) that was higher than the score for any other group.

Highest Degree Completed

- Of the 819 participants in the Iowa study, almost half (46 percent) had not completed any degree. Approximately 45 percent had earned a high school diploma or its equivalent, and eight percent had earned another type of degree.
- Mean scaled scores for both reading and math were consistently higher for those who had completed any degree than for those who had not.

Chapter Five: Predicting Performance on the GED

INTRODUCTION

One of the objectives of this study is to provide accurate and reliable information on score cut-off points to help adult students and instructors make decisions based on basic skills data. One important decision point for adult students who do not have a high school diploma is to know when they are ready to take and pass the Tests of General Educational Development (GED Tests). Passing the GED Tests provides a second chance opportunity for adults to earn a high school equivalency credential, which is needed to achieve other goals, such as qualifying for job training, applying for jobs, and enrolling in further education.

The content of the English-language edition (1988) of the GED Tests corresponds to what graduating high school seniors in the United States are expected to know. The GED Tests are organized into the following five subject areas: 1) writing skills, 2) social studies, 3) science, 4) interpreting literature and the arts, and 5) mathematics. To pass the GED, Iowa currently requires that individuals obtain a minimum standard score of 35 on each of the five subject tests, and have an overall average standard score of 45. Effective January 1, 1997, individuals will have to score a minimum of 40 on each of the five subject tests to comply with the new minimal score requirements established by the Commission on Educational Credit and Credentials.

THE RELATIONSHIP OF CASAS TO THE GED

Two studies have been completed to determine the relationship between CASAS scaled scores and passing the GED. In 1986 and 1987, Rickard and Stiles (1987) collected data from instructors of GED preparation programs to determine the relationship between CASAS scaled scores and GED Practice Test scores. A stepwise regression analysis found that CASAS reading scores were significant predictors of performance on all subtests of the GED Practice Tests, and both CASAS reading and math scores were significant predictors on the GED Practice Math Test.

In 1995, Bakken conducted a study to determine the level of prediction of performance on the GED by the ECS Appraisal Form 130. The subjects of this study were incarcerated male youth. This study concluded that both ECS Appraisal Form 130 reading and math scores were significant predictors of performance on all GED Practice Test subtests. ECS Appraisal Form 130 reading and math scores were also significant predictors of subjects' GED Practice Test average standard score on all subtests. CASAS reading scores were a more significant predictor of scores on all GED subtests than were CASAS math scores, with the exception of GED mathematics on which both CASAS reading and math scores were nearly equal predictors.

CASAS SCALED SCORES AS PREDICTORS OF GED PERFORMANCE FINDINGS

Tables 22 to 27 below contain expectancy data showing CASAS reading scaled scores based on the Bakken study. Table 22, for example, can be interpreted as follows: If a person's reading scaled score is greater than or equal to 245 (245 +), that person has a 61 percent chance of obtaining an average GED score of 45 or more. This table shows that the higher the reading score, the greater the probability of obtaining a higher average score on all GED subtests. This also holds true for all of the subtests, considered individually in Tables 23 through 27. (The Row N, Total %, and Column % Total figures on the chart refer to the Bakken, and not the norming study.)

The expectancy tables for each of the subtests can be useful in determining whether someone is likely to pass the GED. For example, if someone obtains a high score on one or more of the subtests, the high scores will raise the average score on all subtests. As a result, a score in the 35 to 39 point range could lead to an average passing score of 45 or more if it were balanced by higher scores on other subtests. Specifically, someone scoring 231 in reading has a 70 percent likelihood of scoring 40 or more in Social Studies. This score, together with higher scores on other subtests, would produce an average passing score of 45 or more.

Table 22 - ECS Appraisal Form 130 Reading as a Predictor of GED Average Expectancy Table

CASAS Level	ECS Appraisal Form 130 Reading Score	Predicted GED Average Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	76%	18%	6%	72	34%
	231 - 235	35%	49%	16%	37	18%
D/E	236 - 240	28%	50%	22%	32	15%
	241 - 244	27%	27%	46%	15	7%
	245 +	23%	16%	61%	56	26%
	Column % Total	44%	28%	27%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

Table 23 - ECS Appraisal Form 130 Reading as a Predictor of GED Writing Expectancy Table

CASAS Level	ECS Appraisal Form 130 Reading Score	Predicted GED Writing Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	60%	32%	8%	72	34%
	231 - 235	30%	49%	22%	37	18%
D/E	236 - 240	12%	59%	28%	32	15%
	241 - 244	27%	33%	40%	15	7%
	245 +	23%	14%	62%	56	26%
	Column % Total	35%	34%	30%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

Table 24 - ECS Appraisal Form 130 Reading as a Predictor of GED Social Studies Expectancy Table

CASAS Level	ECS Appraisal Form 130 Reading Score	Predicted GED Social Studies Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	65%	22%	12%	72	34%
	231 - 235	30%	35%	35%	37	18%
D/E	236 - 240	28%	38%	34%	32	15%
	241 - 244	20%	40%	40%	15	7%
	245 +	20%	20%	61%	56	26%
	Column % Total	38%	37%	34%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

Table 25 - ECS Appraisal Form 130 Reading as a Predictor of GED Science Expectancy Table

CASAS Level	ECS Appraisal Form 130 Reading Score	Predicted GED Science Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	58%	31%	11%	72	34%
	231 - 235	22%	35%	43%	37	18%
D/E	236 - 240	12%	44%	44%	32	15%
	241 - 244	27%	20%	53%	15	7%
	245 +	12%	25%	62%	56	26%
Column % Total		31%	31%	38%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

Table 26 - ECS Appraisal Form 130 Reading as a Predictor of GED Literature and the Arts Expectancy Table

CASAS Level	ECS Appraisal Form 130 Reading Score	Predicted GED Literature and Arts Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	68%	22%	10%	72	34%
	231 - 235	35%	30%	35%	37	18%
D/E	236 - 240	16%	44%	41%	32	15%
	241 - 244	27%	33%	40%	15	7%
	245 +	23%	12%	64%	56	26%
Column % Total		40%	25%	35%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

Table 27 - ECS Appraisal Form 130 Reading as a Predictor of GED Mathematics Expectancy Table

CASAS Level	ECS Appraisal Form 130 Reading Score	Predicted GED Mathematics Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	79%	12%	8%	72	34%
	231 - 235	65%	27%	28%	37	18%
D/E	236 - 240	50%	34%	16%	32	15%
	241 - 244	40%	27%	33%	15	7%
	245 +	29%	23%	48%	56	26%
	Column % Total	56%	22%	22%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

Table 28 below contains expectancy data showing CASAS math scaled scores based on the Bakken study.

Table 28 - ECS Appraisal Form 130 Math as a Predictor of GED Mathematics Expectancy Table

CASAS Level	ECS Appraisal Form 130 Math Score	Predicted GED Mathematics Score			Row N	Total %
		< 40	40 - 44	45 +		
A/B/C	≤ 230	70%	19%	12%	145	68%
C/D/E	231 +	27%	30%	43%	67	32%
	Column % Total	56%	22%	22%	212	100%

Percentages may not sum to 100 due to rounding error.

CASAS, 1996

THE RELATIONSHIP OF NALS TO THE GED

In 1995, the American Council on Education (ACE) and the Educational Testing Service (ETS) released a report comparing performance on the GED Tests to scores on the NALS. This study of 1,570 individuals was designed to describe the literacy skills of GED examinees, passers and nonpassers, and to determine the relationship among the five GED Tests and the three NALS literacy scales. (See Table 7 and Appendix E.)

The study found that higher scores on the GED Tests corresponded to higher scores on the NALS literacy assessments. The results indicated that GED passers had higher

NALS scores than GED nonpassers.[4] The average NALS score of GED passers was in the Level 3 range, while that of nonpassers was in the Level 2 range. The survey showed that the probability of passing the GED Tests rose for each increase in demonstrated level of literacy on each of the NALS literacy scales. Table 29 can be interpreted as follows: A person scoring in NALS Level 1 for prose literacy has a 17 percent chance of passing the GED; a person scoring in NALS Level 2 for document literacy has a 58 percent chance of passing the GED; and a person scoring in NALS Level 3 for quantitative literacy has a 94 percent chance of passing the GED.

Table 29 - NALS Scales as a Predictor of GED Passage**

NALS Level	Probability of Passing the GED for Each NALS Level on a Given Literacy Scale		
	Prose Literacy	Document Literacy	Quantitative Literacy
1	17%	27%	18%
2	56%	58%	68%
3	91%	88%	94%
4	100%	98%	98%
5	*	*	*

* Sample size is too small to provide a reliable proficiency estimate.
**This chart was extrapolated from J. Baldwin, et al. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Refer to Figure 1.6, p.26.

SUMMARY OF GED FINDINGS AND RECOMMENDATIONS

The following findings and recommendations are based on analysis of CASAS and NALS scores in relation to performance on GED Practice Tests.

- Those who score 241 or more in reading on the CASAS assessment may be ready to take all subtests of the GED. This finding is supported by data collected regarding reading scores for highest degree earned. The mean reading score for participants who reported having completed a GED was 244 on the CASAS scale. (See Table 20.)
- Those who score more than 45 on some GED subtests may be ready to take other subtests, even if their CASAS reading scores are lower than 245. Consult the GED expectancy tables to help inform counseling suggestions for adult learners' further education.

[4]For the purposes of [The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study] , GED passers were defined as test takers who met or surpassed their state's minimum GED score requirements for a GED diploma. Although each state that contracts to use the GED Tests establishes its own minimum requirements, the Commission on Educational Credit and Credentials of the American Council on Education requires that such score requirements be set at a standard no lower than that which would be met by an estimated 75 percent of the 1987 norm group of graduating high school seniors. (This means that at least 25 percent of this norm group does not meet the GED score standard.) In most states, the minimum GED score standard is met by only 70 percent of the norm group. From Janet Baldwin, Irwin S. Kirsch, Donald Rock, and Kentaro Yamamoto. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*, p. 27. Washington DC: American Council on Education and Educational Testing Service, 1995.

- Those who score above Level 1 on any of the NALS literacy scales have a better than 50/50 chance of passing the GED. Those who score above Level 2 have a better than 80/20 chance of passing the GED.

Participants who score below 246 on the CASAS assessment, or in Level 1 or possibly Level 2 on any of the NALS scales generally require some basic skills instruction in order to pass the GED.

Experience using CASAS assessment over time with similar populations has shown that participants gain an average of five points after completing 100 hours of instruction. Table 30 contains referral guidelines relating CASAS reading scores to basic skills instructional needs and GED study requirements.

Table 30 - CASAS/GED Reading Referral Guidelines

CASAS Level	CASAS Reading Score	Estimated Basic Skills Instruction Needed to Prepare for the GED*	GED Study Requirements
A/B/C	≤ 230	More than 300 hours	Not ready for GED preparation
C/D	231 - 240	100 to 300 hours	Ready to begin GED preparation
D	241 - 245	Fewer than 100 hours	Ready to test in some areas based on GED Practice Test results; need limited GED preparation
E	246 +	Additional specific basic skills instruction may be needed, depending on educational goal	

* Estimate based on 5 points gain for 100 hours of instruction.

CASAS, 1996

The following guidelines are provided based on Table 30:

- Those who score 230 or below in reading are likely to require more than 300 hours of basic skills instruction, including GED preparation, in order to pass the GED.
- Those who score between 231 and 240 in reading are likely to require 100 to 300 hours of basic skills instruction, including GED preparation, in order to pass the GED.
- Those who score between 241 and 245 in reading are likely to need fewer than 100 hours of basic skills and GED preparation instruction in order to pass the GED.
- Those who score 246 or above may need some additional specific basic skills instruction, depending on their educational goals.

Referral guidelines relating CASAS math scores to math instructional needs and GED study requirements are shown in Table 31.

Table 31 - CASAS/GED Math Referral Guidelines

CASAS Level	CASAS Math Score	Basic Skills Instructional Needs	GED Study Requirements
A/B/C	≤ 230	Short or long term	May be ready to begin GED preparation
C/D/E	231 +	Limited or none	Ready to test; need limited GED preparation in math

CASAS, 1996

Table 31 suggests the following guidelines for referral and instruction for the math section of the GED:

- Those who score 230 or below in math are likely to require either short or long term basic skills instruction in math in order to pass the GED math section.
- Those who score 231 or higher in math may be ready to take the math subtest of the GED with limited or no preparation.

Chapter Six: Using the Study Results

INTRODUCTION

This chapter offers practical guidance to Iowa's adult basic education providers to help them meet essential program goals and objectives. The first section shows how the CASAS levels fit within and support Iowa's efforts to meet its benchmarks for adult basic education programs. The second section shows how the norming data can be used for program planning, counseling, and referral. Programs that want to set their own local norms can use the information presented in the third section.

MEASURING PROGRESS TOWARD IOWA'S BENCHMARKS FOR ADULT BASIC EDUCATION

The published report entitled *Benchmarks for Adult Basic Education Programs in Iowa's Community Colleges* (1996) presents detailed benchmarks that provide adult basic education program outcome measures through the year 2005. These benchmarks were based on established state performance standards, and provide quantifiable indicators to measure progress toward specific program goals. The benchmarks were also designed to strengthen Iowa's adult basic education program accountability.

Iowa developed its benchmarks for the state-administered adult basic education program in six focus areas:

- Educational gains;
- Program planning;
- Curriculum/instruction;
- Staff development;
- Support services; and
- Recruitment/retention.

Addressing Benchmarks for Educational Gains

Findings in this study are directly related to helping Iowa's adult basic education program meet its *core benchmarks* for the focus area of educational gains.[5] These include the specific benchmarks presented in Table 32.

[5] *Core* benchmarks are defined as benchmarks which describe the crucial program values designed to benefit the individual and society. Source: *Benchmarks for Adult Basic Education Programs in Iowa's Community Colleges* (Iowa's Community College Adult Basic Education Coordinators, 1996), p. 2.

Table 32 - Iowa's Core Benchmarks for Educational Gains in Adult Basic Education

Benchmark No.	Focus Area	Benchmarks for Educational Gains*
#2	Educational Gains	Percentage of adults 18 years and over who have attained a high school or equivalent diploma.
#3	Educational Gains	Percentage of Iowa's GED candidates who pass the General Educational Development (GED) Examinations by Iowa state standards.
#6, 7, 8	Educational Gains	Percentage of adults 16 years and over functioning at the five levels of Prose/Document/Quantitative Literacy.

*Iowa Community College Adult Basic Education Coordinators. *Benchmarks for Adult Basic Education Programs in Iowa's Community Colleges.* Iowa: Author, March 1996. See tables on pages 10, 16, 17, and 18.

Tables 33 and 34 are reference charts that provide the means of addressing these benchmarks. They show the relationship among educational level, CASAS reading and math scores and levels, and NALS levels. These reference charts enable adult basic education students, instructors, administrators, and policy makers to link Iowa's priority competencies and skills levels used in basic skills instruction directly to the Iowa program benchmarks.

The CASAS levels and score ranges from this study of Iowa's JTPA and PROMISE JOBS participants provide norming data for program planning. These data can also be used to chart progress toward Iowa's benchmarks for adult basic education programs, and to provide statewide accountability. The data show that Iowa's adults need to demonstrate minimally that they are functioning at CASAS Level D in reading, CASAS Level C in math, and NALS Level 2 in order to obtain an adult high school diploma or a GED. To successfully pursue college level vocational/technical training, they need to be functioning at CASAS Level E in reading, CASAS Level D in math, and NALS Level 3. (For further information on the relationship between NALS literacy proficiency and educational attainment, see Appendix E.)

Table 33 - Reference Table Showing Relationship between Education Level and CASAS Reading and NALS Prose and Document Levels and Scores

Highest Education Level or Degree Completed	CASAS Reading Scores	CASAS Levels	Approximate NALS Levels*	Approximate NALS Scores from Prose and Document Scales*
≤ 8	≤ 230	A/B/C	1	170 - 177
9 - 11	231 - 240	C/D	2	227 - 231
12	241 - 245	D	2	**
High School	241	D	2	264 - 270
GED	244	D	2/3	GED Credential: 264 - 268 GED Passers: 289 - 290
Vocational/ technical training; some college; AA	246 - 250	E	3	290 - 308

*J. Baldwin, et al. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Refer to Figures 1.5a and 1.5b, pp. 22 and 23.
**Data not available as part of the Baldwin study.

CASAS, 1996

Table 34 - Reference Table Showing Relationship between Education Level and CASAS Math and NALS Quantitative Levels and Scores

Highest Education Level or Degree Completed	CASAS Math Scores	CASAS Levels	Approximate NALS Levels*	Approximate NALS Scores from the Quantitative Scale*
≤ 8	≤ 218	A/B	1	169
9 - 11	219 - 225	B/C	2	227
12	226	C	2	**
High School	226 - 227	C	2	270
GED	228 - 229	C	2/3	GED Credential: 268 GED Passers: 284
Vocational/ technical training; some college; AA	230 - 250	C/D/E	3	295 - 307

*J. Baldwin, et al. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Refer to Figure 1.5c, p. 24.
**Data not available as part of the Baldwin study.

CASAS, 1996

Addressing Benchmarks for Target Populations

Two of Iowa's core benchmarks for adult basic education, in the area of recruitment and retention, address the need to increase the percentage of the priority target population(s) served and the percentage of these groups completing or continuing in the program. (See Table 35.)

Table 35 - Iowa's Core Benchmarks for Target Populations

Benchmark No.	Focus Area	Benchmarks for Target Populations*
#28	Recruitment/Retention	The percentage of priority target population(s) served statewide.
#29	Recruitment/Retention	The percentage of target population(s) competing or continuing in the program.

*Iowa Community College Adult Basic Education Coordinators. *Benchmarks for Adult Basic Education Programs in Iowa's Community Colleges.* Iowa: Author, March 1996. See tables on pages 15 and 26.

Iowa has identified six priority target populations for adult basic education and vocational training services.[6] (Beder, 1995). These six groups are as follows:

- Persons for whom English is their second language **(ESL)** (1.4% of the Iowa adult population).
- Least educated school dropouts **(LoDRP)** who dropped out at grade ten or before (1.7% of the Iowa adult population).
- At-risk youth **(ARY)**, ages 16 to 21, who have not completed high school and are not currently enrolled in school (.6% of the Iowa population age 16 and over).
- Dropouts with relatively high educational **(HiDRP)** attainment who dropped out during eleventh grade (3.1% of the Iowa adult population).
- Able-bodied welfare recipients **(AWR)** (7.4% of the Iowa adult population and 75% of those receiving welfare in Iowa).
- Low-wage earners **(LWW)** who have not received public assistance (8.4% of the Iowa adult population).

Collectively, these priority target populations comprise 22.6 percent of Iowa's adult population. People in these groups generally have low skills levels and have the greatest need to access Iowa's Workforce Development Centers. Therefore, it is imperative that a strong basic skills assessment system be in place. For adults who fall within these six priority target groups, further assessment could be recommended in order to help them choose appropriate education and training options. (See also *Assessment of Basic Skills Competencies in Iowa's Employment and Workforce Programs*, 1995.)

Tables 36 and 37 relate findings from the norming study to the *Iowa Adult Literacy Profiles* report (Beder, 1995). The tables show that all but one group fall within CASAS Levels A through D in reading, and all but two fall within CASAS Levels A through C in math. The scale indicates that those who fall in the D Level in reading are at the very beginning of that level. The tables also show that all but one of the target groups falls into NALS Levels 1 and 2.

[6]For further information about Iowa's six priority targeted populations, consult H. Beder. *Iowa Adult Literacy Profiles: A Secondary Analysis of the Iowa State Adult Literacy Survey*, Volume 1, No. 3. New Brunswick, NJ: Rutgers University, 1995.

Table 36 - Reference Table Showing Relationship between Target Populations and CASAS Reading and NALS Levels and Scores

Priority Target Populations	Mean CASAS Reading Scores	CASAS Levels	Approximate NALS Levels*	Average NALS Scores from Prose, Document, and Quantitative Scales*
ESL	229	A/B/C	1	189
LoDRP/ 10th & below	236 & below	A/B/C	2	228
ARY	236	D	2	271
HiDRP/ 11th +	237 +	D	2	246
AWR	239	D	2	267
LWW	**	**	3	278

*H. Beder. *Iowa Adult Literacy Profiles;* A Secondary Analysis of the Iowa State Adult Literacy Survey, Volume 1, No. 3. New Brunswick, NJ: Rutgers University, 1995. Refer to Table 1, p.2.
**Data not available as part of this study.

CASAS, 1996

Table 37 - Reference Table Showing Relationship between Target Populations and CASAS Math and NALS Levels and Scores

Priority Target Populations	Mean CASAS Math Scores	CASAS Levels	Approximate NALS Levels*	Average NALS Scores from Prose, Document, and Quantitative Scales*
ESL	220	A/B	1	189
LoDRP/ 10th & below	222 & below	A/B/C	2	228
AWR	222	C	2	267
HiDRP/ 11th +	223 +	C	2	246
ARY	226	C	2	271
LWW	**	**	3	278

*H. Beder. *Iowa Adult Literacy Profiles;* A Secondary Analysis of the Iowa State Adult Literacy Survey, Volume 1, No. 3. New Brunswick, NJ: Rutgers University, 1995. Refer to Table 1, p. 2.
**Data not available as part of this study.

CASAS, 1996

These data suggest that all of Iowa's target populations would benefit from basic skills instruction and confirm the need to include adult basic education instruction in any comprehensive delivery plan designed to assist these populations.

Addressing Benchmarks for Basic Skills Instruction

Programs using CASAS will easily be able to meet the benchmarks that relate to basic skills instruction in the focus areas of educational gains, and curriculum and instruction. Table 38 contains these benchmarks.

Table 38 - Benchmarks for Basic Skills Instruction

Benchmark No.	Focus Area	Benchmarks for Basic Skills Instruction*
#1	Educational Gains	Percentage of adult basic education students whose educational progress will be measured in terms of competency based outcomes.
#17	Curriculum/Instruction	Percentage of Iowa's ABE programs that have a method in place which correlates curriculum/instructional materials with assessed skills levels.
#18	Curriculum/Instruction	Percentage of Iowa's ABE programs that, as evidenced by course outlines, target priority Iowa Adult Basic Skills Survey (IABSS) competencies in concert with basic skills.

*Iowa Community College Adult Basic Education Coordinators. *Benchmarks for Adult Basic Education Programs in Iowa's Community Colleges*. Iowa: Author, March 1996. See tables on pages 10, 12, 16, and 21.

The CASAS system helps programs respond to Benchmark #1 by allowing students' progress to be measured in terms of completed basic skills competencies. Many of the competencies assessed using CASAS are the priority competencies identified in the IABSS study. These same competencies should be emphasized in instruction in order to meet the goal of Benchmark #18.

The *CASAS Curriculum Material Guide* helps instructors identify instructional resources that are linked to competencies and coded to skills levels. It provides a means to respond to Benchmark #17.

USING NORMING DATA FOR PROGRAM PLANNING, COUNSELING, AND REFERRAL

Use of Norming Study Data

In addition to individual decision making, the results of the norming study can help shape program and policy in the larger economic and workforce development arena. Agencies and policy makers can use these norms to facilitate communication for a variety of educational purposes:

- planning for block grants at the state and local level;
- developing descriptors that articulate basic skills functioning of adults in work, family, and community contexts;
- coordinating one stop planning teams to communicate basic skills outcomes across agency lines;
- defining student gains for policy, program, and legislative initiative planners;

- building individual student basic skills certification systems;
- implementing student portfolios;
- facilitating student movement across and through levels; and
- informing adult learners of educational progress.

Using Norming Study Data for Counseling and Referral

Information from this study can also be used effectively by career counselors and other staff at one stop career centers and in other career counseling settings including rehabilitation. These services are offered to people who are in the following situations:

- entering the workforce for the first time;
- re-entering the workforce;
- in the workforce but need additional training and retraining; or
- in the workforce but need assistance finding a different job.

This information is invaluable and serves a variety of essential functions. It provides:

- clear outcome levels for youth and adult basic education and job training programs;
- specific entry levels for specific vocational training programs;
- guidelines for counselors and job developers for referrals for jobs and training;
- benchmarks for learners to help clarify their short term and long term career goals; and
- realistic information for employers to guide hiring decisions.

Reading and math scaled scores can be used to counsel individual clients regarding job or training possibilities given the client's current basic skills levels. These scores can also be used to advise clients regarding basic skills training needed to reach their career goals. (Refer to Tables 4, 5, and 6 for CASAS score ranges and descriptions of skills levels.)

When the basic skills levels of a job or training program are known, learners and counselors can use the reading and math test scores, along with other information, to guide clients in their career planning. As discussed in the second report in this series, *Assessment of Basic Skills Competencies in Iowa's Employment and Workforce Programs* (November 1995), there are three other assessment instruments in the ECS system:

- the ECS Critical Thinking Measure;
- Oral Communication Applied Performance Appraisal (OCAPA); and
- the ECS Pre-Employment/Work Maturity Checklists.

All four ECS instruments, including the ECS Appraisals, are needed to provide comprehensive assessments of business and industry's priority competencies, as documented by the *Iowa Adult Basic Skills Survey (IABSS)*. Competencies that require reading and math skills can be measured through a multiple choice format using the ECS 130 Appraisal. However, because so many of the priority competencies require listening and speaking skills, it is important to assess these skills in a standardized reliable manner. The OCAPA and ECS Checklists were designed to measure these skills utilizing interview and observation techniques. Critical thinking and writing skills,

which are given high priority by business and industry respondents on the IABSS study, need to be assessed using generated writing samples and standard tasks that require multiple step responses.

Counselors can help learners develop an individual profile that incorporates the results from the entire ECS battery. This information will complement other career planning assessment results, such as career exploration inventories, and aptitude and interest surveys.

Summary of Norming Study Findings

Table 39 combines the CASAS level, CASAS *reading* score range, NALS level, and educational level findings from this norming study with recommendations for basic skills instruction and GED study requirements. Table 40 combines the CASAS level, CASAS *math* score range, NALS level, and educational level findings from this norming study with recommendations for basic skills instruction and GED study requirements.

Table 39 - Summary Reading Referral Guidelines

CASAS Level	CASAS Reading Score	Approximate NALS Level	Highest Education Level or Degree Completed	Estimated Basic Skills Instruction to Complete Level D*	GED Study Requirements
A/B/C	≤ 230	1	≤ 8	More than 300 hours	Not ready for GED preparation
C/D	231 - 240	2	9 - 11	100 - 300 hours	Ready to begin GED preparation
D	241 - 245	2	12th grade; high school; GED	Fewer than 100 hours	Ready to test in some areas based on GED Practice Test results; need limited GED preparation
E	246 +	3	Vocational/ technical training; some college	Additional specific basic skills instruction needed depends on educational goal	

* Estimate based on 5 points gain for 100 hours of instruction.

CASAS, 1996

Table 40 - Summary Math Referral Guidelines

CASAS Level	CASAS Math Score	Approximate NALS Level	Highest Education Level or Degree Completed	Estimated Basic Skills Instruction to Complete Level D	GED Study Requirements
A/B/C	≤ 230	1/2	12th grade; high school; GED	Short or long term	May be ready to begin GED preparation
C/D/E	231 +	3	Vocational/ technical training; some college	Limited or none	Ready to test; need limited GED preparation in math

CASAS, 1996

The information in these tables should help program counselors and other staff make placements and referrals into basic skills and GED instruction, based on a learner's assessed CASAS scaled scores:

Reading

Individuals who have a CASAS reading score of *240 or lower* would need basic skills training to prepare for vocational/technical training or jobs beyond entry level. Those whose reading score is *between 241 and 245* should be assessed further to determine what education and training is needed for their own goals. Those whose reading score is *246 or higher* could probably pursue vocational/technical training or enter the workforce without further basic education.

Results from the norming study, summarized in Table 41, strongly support these cut-off points:

- Individuals scoring 245 or above on the ECS reading assessment have a 61 percent chance -- better than 50/50 -- of meeting the required average standard test score of 45 for passing the GED. (See Table 22 and Table 41, column 3.) They also have a 71 to 87 percent chance of meeting the required minimum standard test score of 40 for any of the individual GED subject tests. (See Tables 23 through 27 and Table 41, column 4.)
- Individuals scoring between 241 and 245 on the ECS reading assessment have only a 46 percent chance -- slightly less than 50/50 -- of meeting the required average standard test score for passing the GED. (See Table 22 and Table 41, column 3.) However, they have a 60 to 80 percent chance -- better than 50/50 -- of meeting the required minimum standard test score of 40 for any of the individual GED subject tests. (See Tables 23 through 27 and Table 41, column 4.)
- Individuals scoring 240 or below on the ECS reading assessment have at best a 22 percent chance of meeting the required average standard test score of 45 for passing the GED. (See Table 22 and Table 41, column 3.)
- The average reading score of those who have already attained a GED is 244, so most individuals who score at this level should be able to pass the GED test. (See Table 20 and Table 41, column 5.)
- The average reading score of those with some vocational/technical education is 246, so most individuals who score at this level should be prepared to pursue vocational/technical studies. (See Table 20 and Table 41, column 5.)

Table 41 - Select Characteristics for Reading Cut-Off Points

ECS Appraisal Form 130 Reading Score	Reading Cut-Off Points	Probability of Meeting the GED Average Score Requirement (45)	Probability of Meeting Individual Subject Score Requirements (40)	Average Reading Score for Select Educational Attainment
≤ 240	Need basic skills training	≤ 22%	*	
241 - 245	Need further assessment	46%	60% - 80%	244 - GED attainment
246 +	Can go on to vocational/ technical training or a job	61%	71% - 87%	246 - Some vocational/ technical training

*Available data cannot be aggregated for this category.
CASAS, 1996

Math

Individuals who have a CASAS math score of *230 or lower* would probably need basic skills training to prepare for vocational/technical training or jobs beyond entry level. Those scoring *between 231 and 235* should be assessed further to determine what education and training is needed for their own goals. Those whose math score is *236 or higher* could probably pursue vocational/technical training or enter the workforce without further basic education.

Results from the norming study, summarized in Table 42, support these breaks as well:

- Individuals scoring 231 or above on the ECS math assessment have a 73 percent chance -- better than 50/50 -- of meeting the required minimum standard test score of 40 for the individual GED math subject test. (See Table 28 and Table 42, column 3.)
- Individuals scoring 230 or below on the ECS math assessment have only a 31 percent chance -- far less than 50/50 -- of meeting the required minimum standard test score of 40 for the individual GED math subject test. (See Table 28 and Table 42, column 3.)
- The average math score of those who have already attained a GED is 229, so one might expect that most individuals who score at this level would be able to pass the GED test. (See Table 20 and Table 42, column 4.) However, the individuals in this study with GED certificates attained these degrees when Iowa only required a minimum standard test score of 35 on each individual GED subject test. Iowa will soon be raising this minimum standard test score to 40. Therefore, the data indicate setting the cut-off point at the level suggested by the GED prediction study, and requiring additional basic skills training for individuals scoring 230 or below on the ECS math assessment.
- The average math score of those who have had some vocational/technical education is 233, so one might expect that most individuals who score at this level would be prepared to pursue vocational/technical studies. (See Table 20 and Table 42, column 4.) However, both vocational/technical training and many good-paying entry level jobs are becoming increasingly quantitative in nature. Therefore, the data indicate assessing the skills and goals of individuals scoring in the 231 to

235 range more closely, rather than assuming that they do not need further basic skills training.

Table 42 - Select Characteristics for Math Cut-Off Points

ECS Appraisal Form 130 Math Score	Math Cut-Off Points	Probability of Meeting the GED Math Score Requirement (40)	Average Math Score for Select Educational Attainment
≤ 230	Need basic skills training	32%	229 - GED attainment*
231 - 235	Need further assessment	73%	233 - Some vocational/ technical training**
236 +	Can go on to vocational/ technical training or a job		

*The CASAS math score needed for GED attainment is expected to rise with Iowa's shift from a required minimum standard test score of 35 on the individual GED math test, to a required minimum standard test score of 40.
**The CASAS math score needed to succeed in vocational/technical training is expected to rise because of the increasingly quantitative nature of such training programs.

CASAS, 1996

These cut-off points are also supported by the levels of performance of GED certificate holders in other states. Table 43 shows that the average CASAS reading scores of GED certificate holders in a number of other states range from 241 to 245, while the average CASAS math scores range from 226 to 236. In general, these data show that individuals who have passed the GED in other states have CASAS reading and math scores above the lowest cut-off points promoted above. In the one case (Oregon average math score) the data show individuals have successfully attained GED certificates with lower CASAS scores, the average CASAS score is only slightly lower than the proposed cut-off point. Iowa's proposed cut-off points are clearly in line with the experience of other states.

Table 43 - CASAS Scores of GED Certificate Holders in other States

Mean Scaled Scores	Midwest Aggregate*	Oregon Aggregate**	Washington Aggregate**
Reading	241	244	245
Math	236	226	232

*Data was collected from Iowa, Indiana, Michigan, and Nebraska for the Midwest Aggregate.
**All ECS Appraisal data collected from 1992 to 1995 using the Oregon BASIS and ECS Appraisal Form 400, and the Washington ECS Appraisal.

CASAS, 1996

Because so few individuals scored at the higher math levels, the recommended cut-off points are just preliminary. Further study should be done with individuals who are succeeding in the workplace, in order to establish these cut-off points more firmly.

Setting Iowa State Basic Skills Certification Levels

Measuring *and certifying*, the progress of those undertaking basic skills instruction would be valuable for learners, program operators, and employers.

- Learners would have concrete evidence of their accomplishments, and would not become discouraged too quickly.
- Program operators -- instructors, counselors, program directors -- would be able to take credit for advancing learners' skills, even if learners were not yet able to complete a traditional educational milestone (e.g. passing the GED Tests).
- Employers would have a tool to gauge the abilities of employees and job candidates.

The five CASAS levels, presented in Table 4, could serve as a base of discussion for setting certification levels for Iowa's adult basic education program. The levels in the CASAS scale were developed based on the experience of a number of states using CASAS, and indicate natural breaks in basic skills development. Iowa might modify this scale to meet state conditions and objectives.

Iowa could issue certifications of reading and math skills based on individuals' performance on CASAS assessments. These certifications could incorporate the actual language in Table 4 delineating reading and math abilities, so that learners could use the certificates to inform employers (or others) of their capabilities.[7]

SETTING LOCAL NORMS FOR VOCATIONAL TRAINING AND WORKPLACE INSTRUCTION

Local programs can conduct their own research to develop local norms for learners who need guidance to know when they have sufficient basic skills to enter vocational training or specific jobs. One approach to conducting a study of this type is to administer the ECS Appraisal to current employees and job trainees who are functioning successfully. Additional information about job and vocational training requirements can be gathered using the Workforce Learning System's Basic Skills Analysis process. This type of local research study serves to provide local norms in terms of CASAS scaled scores.

[7]CASAS' new electronic TOPS (Tracking of Programs and Students) system could be upgraded to generate competency-based learner transcripts or certifications specifying the level and types of skills learners attain.

Chapter Seven: Conclusions, Recommendations, and Summary

CONCLUSIONS

The information contained in this report provides a basis for predicting the skill levels and characteristics of Iowa's JTPA and PROMISE JOBS participants, and for using CASAS scores for program reporting and decision making.

JTPA and PROMISE JOBS Population

- The reading skills of the JTPA and PROMISE JOBS population are fairly high. The mean reading score for this group was 238, which is in the Level D score range. The largest percentage (62%) of this population scored in Level D or E in reading. Despite this high overall performance, a significant percentage of JTPA and PROMISE JOBS participants need additional reading instruction.
- JTPA and PROMISE JOBS participants' math skills are not as high as their reading skills. The mean math score for this group was 224, which is in the C score range. Only 19 percent of the population scored in Level D or E in math, while 38 percent scored in Level B or below. Most JTPA and PROMISE JOBS participants will need additional math instruction.
- In general, the oldest and youngest JTPA and PROMISE JOBS participants have the lowest reading and math skills.
- Black (non-Hispanic) and Hispanic participants have lower skills than White (non-Hispanic) participants.
- While non-native English speakers are likely to need more reading instruction than native English speakers, their math skills are comparable to those of native English speakers.
- Participants with less formal education will probably need more reading and math instruction than those with greater amounts of formal education.

Program Reporting and Decision Making

- When programs are required to report participants' reading and math skills by grade level, they can use the norming results of this study to determine the grade level corresponding to particular CASAS scores.
  - A CASAS reading score of 230 or less (Levels A, B, and part of C) corresponds to eight or fewer years of schooling; a score of 231 to 240 (the upper end of Level C and the lower end of Level D) corresponds to nine to 11 years; a score of 241 to 245 (the upper end of Level D) corresponds to 12 years; and a score of 246 or more (Level E) corresponds to vocational/technical training or some college.
  - A CASAS math score of 218 or less (Level A and most of Level B) corresponds to eight or fewer years of schooling; a score of 219 to 225 (the upper end of Level B and the lower end of Level C) corresponds to nine to 11 years; a score of 226 to 232 (the middle part of Level C) corresponds to 12 years; and a score

of 233 or more (the upper end of Level C and Levels D and E) corresponds to vocational/technical training or some college.

- CASAS reading and math scores can also be used to predict whether an individual is likely to pass the GED Tests. A reading score of 245 or above (Level E) would suggest that an individual had a better than 50/50 chance of meeting the average standard score requirement for passing. Reading and math scores of 231 or better (the upper end of Level C and Levels D and E) would indicate that an individual had a better than 50/50 chance of meeting the individual subject test standard score requirements for passing.
- CASAS scores can also be used to predict the amount of additional basic and GED preparatory instruction individuals will need to pass the GED.
  - Those with reading scores of 230 or below are likely to require more than 300 hours of instruction, those with reading scores between 231 and 240 are likely to need 100 to 300 hours, and those with reading scores between 241 and 245 are likely to need fewer than 100 hours.
  - Those with math scores of 230 or below could require either short or long term instruction, while those with math scores of 231 or higher may be ready to take the math subtest of the GED with little or no preparation.
- CASAS scores can also be used to meet a number of Iowa's core benchmarks, specifically those related to educational gains, target populations, and basic skills instruction.
  - **Educational Gains.** A CASAS reading score of 241 or above, and a CASAS math score of 226 or above would indicate that individuals probably had the skills to attain a high school diploma. A CASAS reading score of 244 or above and a CASAS math score of 228 or above would indicate that they probably had the skills to attain a GED diploma and to function at NALS Level 3 or higher.
  - **Target Populations.** Individuals for whom English is their second language are likely to score in Levels A, B, or C on the CASAS reading assessment, and in Levels A or B on the CASAS math assessment. Dropouts with only ten or fewer years of schooling are likely to score in Levels A, B, or C on the CASAS reading and the CASAS math assessments.

    Welfare recipients, at-risk youth, and dropouts with more than ten years of schooling are likely to score in Level D on the CASAS reading assessment and Level C on the CASAS math assessment. There are no data on CASAS scores for low wage earners, but their likely NALS level suggests that they might score in Level E on the CASAS reading and Levels C, D, or E on the CASAS math assessments.
  - **Basic Skills Instruction.** The CASAS system allows learners' progress to be measured in terms of competencies. The *CASAS Curriculum Material Guide* helps instructors identify instructional resources that are linked to competencies and coded to skills levels.
- Agencies and policy makers can use the norms from this study to help shape programs and policies. Information from this study can also be used effectively to help: 1) learners make decisions on further education and training, 2) instructors plan learners' training programs, and 3) employers make employment and training decisions.

RECOMMENDATIONS

The results of this norming study provide policy makers and practitioners with a basis for advancing adult basic education practices in Iowa.

Recommendation One

The CASAS ECS appraisal instrument should be used in Iowa's Workforce Development Centers as the common appraisal instrument for gaining an initial indication of the functional literacy of the six priority populations targeted for adult basic education and vocational training services. The ECS Appraisal was the instrument used with the norming study, and measures most of the priority basic skills competencies identified by the business and industry sector in the IABSS study.

Iowa adult education practitioners can use the CASAS appraisal to determine whether individuals need basic skills instruction, should be assessed in more detail, or are ready to move directly into vocational education or employment.

- A score of under 241 (Levels A, B, C, and part of D) in reading and under 231 (Levels A, B, and part of C) in math would identify those who should be referred to the community college adult education program for further evaluation and instruction.
- Reading scores between 241 and 245 (Level D), and math scores between 231 and 235 (Level C) would identify those individuals who should be assessed further and counseled about the best program of education and training for meeting their career goals.
- A score of 246 or above (CASAS Level E) on the reading and 236 or above (CASAS Levels D and E) on the mathematics section of the appraisal would identify those individuals whose literacy proficiency would enable them to function effectively in the workforce.

Recommendation Two

Iowa policy makers and adult education practitioners should use the information in this report to begin a dialogue on setting levels for granting certifications based on competency attainment of basic skills. The CASAS Levels A through E, presented in this report, provide a reasonable model for certification levels. Iowa's adult basic education program may want to adopt these levels as presented here, or modify them based on particular conditions and objectives in Iowa.

Recommendation Three

Further study should be done with individuals in the workplace, in order to determine the level of reading and math skills that is required for success. Such studies would serve to validate the cut-off scores established in the norming study.

Recommendation Four

Iowa policy makers and adult education practitioners should conduct research that would enable them to set certification levels in areas other than reading and mathematics, including communication, writing, and pre-employment skills.

SUMMARY

The three studies in the IABSS series provide a key to developing a high performance education and training system that can provide effective, targeted instruction, raise overall achievement, and provide new opportunities for all Iowans. (See page 1 for descriptions of these three studies.) These studies provide a clear direction for: 1) targeting resources, 2) focusing new curriculum development, 3) developing assessments that directly measure high priority skills, and 4) ensuring clear accountability for programs and learners.

This third study provides a snapshot of JTPA and PROMISE JOBS participants and enhances understanding of the employment and basic skills needs of these members of Iowa's future workforce. It also contains critical information about the basic skills levels required for learners to successfully pursue employment and further education and enter vocational/technical training programs. Counselors, instructors, and employers can use information from this study to make key training and employment decisions, including determining learners' and employees' needs for additional basic skills training.

The long range goal for Iowa's adult basic education program is to provide professional services, accountable to all stakeholders, that meet the changing needs of the state's adult learners within the existing community college adult basic education delivery system. The comprehensive research studies and data for moving toward this goal are now available. It's time to move from this strong research base to an action plan.

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Appendix A: About the CASAS Assessment System

The Comprehensive Adult Student Assessment System (CASAS) provides learner-centered curriculum management, assessment and evaluation systems in education and training programs throughout the public and private sector. CASAS is used nationwide in adult basic education (ABE), English as a second language (ESL), workplace literacy, family literacy, JTPA, welfare reform/JOBS, amnesty, and correctional programs.

CASAS is more than just a test. The system includes:

- curriculum resources;
- standardized competency-based assessment, including both multiple-choice and performance-based instruments;
- guidelines for ongoing classroom assessment;
- program and classroom evaluation instruments; and
- training resources.

ASSESSMENT

The CASAS assessment system addresses:

- life skills in the topic areas of consumer economics, community resources, health, employment, government and law, mathematical computation, learning to learn, and domestic skills;
- employability through the Employability Competency System and Workforce Learning Systems series of standardized tests and alternative assessment instruments;
- academic subjects for secondary diploma programs, including English/language arts, mathematics, American government, U. S. history, world history, economics, biological science, and physical science;
- special education needs through tests designed for special needs students, including the developmentally disabled;
- citizenship through a federally-approved examination of knowledge of history and government of the United States; and
- Spanish literacy.

CASAS tests measure:

- reading comprehension;
- mathematics skills;
- listening comprehension;
- writing;
- speaking; and
- critical thinking and problem solving.

CASAS tests are used to:

- place learners in the appropriate program, level, or test;
- diagnose learners' knowledge and skills needs;
- monitor learner progress; and
- certify learner proficiency levels.

CASAS assessment modes include:

- paper-and-pencil tests:
  - multiple-choice tests – the survey achievement series in life skills, employability, academic subjects and special education, and the citizenship test; and
  - written response tests – critical thinking tests, a generated-response test in which students must produce their own answers, and writing dictation items; and
- performance-based assessment:
  - demonstration of ability through performance of competency-related tasks, including oral interview situations, simulations and functional writing tests; and
  - checklists for recording observed student performance.

OVERVIEW OF THE EMPLOYABILITY COMPETENCY SYSTEM (ECS)

The Employability Competency System (ECS) was developed to provide a structure in which learners' strengths and weaknesses are assessed in relation to the skills necessary to get and to keep a job. This assessment is supported by a curriculum management system that links the skills needed in the workplace to instruction.

The Employability Competency System also helps agencies identify youth and adults in need of skills for success in the workforce and places them into appropriate education and employment training programs. The system monitors learners' progress and certifies their attainment of employment-related competencies. Agencies across the country have been successfully using ECS to help meet participant needs as well as meet JTPA requirements.

The ECS Appraisal provides an initial assessment of a learner's proficiency level in English in a functional employability context. Test results may be used to place students in the appropriate level of instruction and, for students who will be entering CASAS progress testing, to identify the appropriate level CASAS pretest. Progress test series are used in a pretest/post-test design to provide standardized information about learning gains.

There are two main series of survey achievement pretests and post-tests, the Life Skills series and the Employability series, which differ largely in content focus. They each include reading and math tests and, for ESL learners, listening comprehension tests.

Each series has a corresponding appraisal; certification tests are available for life skills in reading and for employability in reading and math. CASAS also has test series for special education and secondary diploma programs.

DESCRIPTION OF APPRAISAL TESTS

The ECS Appraisal Tests contain a reading test and a math test; programs may administer one or both depending on their needs. Reading and math tests on Form 130 have 25 items; there is also an optional test item dealing with critical thinking. Items address a range of employment-related competencies:

- Reading test items call on learners to answer a question by locating and/or interpreting information in a functional context, as presented in the form of a display. Displays may consist of a sign, a chart, a form, a set of procedures, a reading passage, etc., depending on the competency tested. Students are to select one of four answers presented.
- Most math test items require students to locate information on a display, such as a chart, a sign, or a pay stub, and perform a calculation. Tests also include a number of computation items and word problems. Four answer choices are presented.

Test administration times are shown below. Most students should be able to finish the test within the stated time period or at least do as much as they are capable of doing. Those who need extra time may be given a few extra minutes.

	Reading	Math	Critical Thinking (optional)
Form 130	25 minutes	25 minutes	10 minutes

The Extended ECS Appraisal Form 130 contains an optional third part consisting of an item that focuses on critical thinking.

Appendix B: ECS Appraisal Answer Sheet for Form 130

READING
PRACTICE
Ⓐ Ⓑ Ⓒ Ⓓ
Ⓐ Ⓑ Ⓒ Ⓓ

READING
1 Ⓐ Ⓑ Ⓒ Ⓓ
2 Ⓐ Ⓑ Ⓒ Ⓓ
3 Ⓐ Ⓑ Ⓒ Ⓓ
4 Ⓐ Ⓑ Ⓒ Ⓓ
5 Ⓐ Ⓑ Ⓒ Ⓓ
6 Ⓐ Ⓑ Ⓒ Ⓓ
7 Ⓐ Ⓑ Ⓒ Ⓓ
8 Ⓐ Ⓑ Ⓒ Ⓓ
9 Ⓐ Ⓑ Ⓒ Ⓓ
10 Ⓐ Ⓑ Ⓒ Ⓓ
11 Ⓐ Ⓑ Ⓒ Ⓓ
12 Ⓐ Ⓑ Ⓒ Ⓓ
13 Ⓐ Ⓑ Ⓒ Ⓓ
14 Ⓐ Ⓑ Ⓒ Ⓓ
15 Ⓐ Ⓑ Ⓒ Ⓓ
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22 Ⓐ Ⓑ Ⓒ Ⓓ
23 Ⓐ Ⓑ Ⓒ Ⓓ
24 Ⓐ Ⓑ Ⓒ Ⓓ
25 Ⓐ Ⓑ Ⓒ Ⓓ

MATH
PRACTICE
Ⓐ Ⓑ Ⓒ Ⓓ
Ⓐ Ⓑ Ⓒ Ⓓ

MATH
26 Ⓐ Ⓑ Ⓒ Ⓓ
27 Ⓐ Ⓑ Ⓒ Ⓓ
28 Ⓐ Ⓑ Ⓒ Ⓓ
29 Ⓐ Ⓑ Ⓒ Ⓓ
30 Ⓐ Ⓑ Ⓒ Ⓓ
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45 Ⓐ Ⓑ Ⓒ Ⓓ
46 Ⓐ Ⓑ Ⓒ Ⓓ
47 Ⓐ Ⓑ Ⓒ Ⓓ
48 Ⓐ Ⓑ Ⓒ Ⓓ
49 Ⓐ Ⓑ Ⓒ Ⓓ
50 Ⓐ Ⓑ Ⓒ Ⓓ

EMPLOYABILITY COMPETENCY SYSTEM

E.C.S. APPRAISAL PROGRAM

4

① Name _____ ② Today's Date / /

③ Male ○ Female ○ ④ Social Security Number – –

5 State	6 County	7 Census Delivery Area	8 Age	9 Highest Grade Level Completed	10 Highest Diploma/Degree Earned	11 Native Language	12 Racial/Ethnic Background	13 Form
					○ None ○ GED Certificate ○ High School Diploma ○ Technical ○ A.A. Degree ○ Other	○ English ○ Arabic ○ Cambodian ○ Chinese ○ Farsi ○ Japanese ○ Korean ○ Polish ○ Portuguese ○ Russian ○ Spanish ○ Tagalog ○ Vietnamese ○ Other Name other	○ White (non-Hispanic) ○ Black (non-Hispanic) ○ Hispanic ○ American Indian ○ Asian/Pacific Islander ○ Other Name other	1 3 0

CRITICAL THINKING

Item	Score
Ⓐ	0
Ⓑ	1
Ⓒ	2
Ⓓ	3
Ⓔ	4
Ⓕ	

MARKING ANSWERS

1	○ Ⓑ Ⓒ Ⓓ	RIGHT
2	⊗ Ⓑ Ⓒ Ⓓ	WRONG
3	Ⓐ Ⓑ Ⓒ Ⓓ	WRONG
4	Ⓐ Ⓑ ○ Ⓓ	WRONG

CASAS ECS PRE-EMPLOYMENT/ WORK MATURITY SKILLS CHECKLISTS A-F

Mark if passed

- ○ A Making Career Decisions
- ○ A Using Labor Market Information
- ○ B Preparing a Resume
- ○ C Writing a Cover Letter
- ○ D Filling Out Applications
- ○ E Interviewing
- ○ F Being Punctual
- ○ F Regular Attendance
- ○ F Good Interpersonal Relations
- ○ F Positive Attitude/Behaviors
- ○ F Appropriate Appearance
- ○ F Completing Tasks Effectively

STUDENT IDENTIFICATION

PROGRAM USE

A	B	C	D	E
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

EXAMINERS: Return this page, and answer strips from second page, to:

ECS/CASAS
P.O. Box 80488
San Diego, CA 92138

PART ONE OF TWO PARTS

Appendix C: ECS Appraisal Form 130 Technical Information

Tests in the Employability series are made up of items drawn from the CASAS item bank. The application of Item Response Theory (IRT) to test items assigns a reliable index of standardized difficulty to each item. Test forms developed from these items accurately measure basic skills in a functional context. The use of CASAS assessment instruments enables instructors to compare the achievement scores of learners along a continuum of difficulty rather than using traditional norm-referenced grade level scores.

The psychometric properties of the ECS Appraisal Test Form 130, given in the table below, show the instrumentation used in the test to be internally consistent and accurate with the psychometric model used.

	Reliability Kuder-Richardson KR-20 Index		Item-Total Correlations Point Bi-Serial Correlation Coefficients	
	Reading	**Math**	**Reading**	**Math**
Form 130	.84	.84	mean = .46	mean = .44

Consult the *CASAS Technical Manual* for further information.

Appendix D: Standard Deviations and Tables of Significance

Standard Deviations and Tables of Significance for
Table 11 - Iowa Population Mean Scaled Scores by Program Type

Program Type	Reading	Math	N
JTPA	235.8 (13.33)	225.8 (12.65)	291
PROMISE JOBS	238.5 (11.54)	222.3 (12.30)	314
Both	238.9 (11.34)	223.5 (11.86)	214
Total	**237.6 (12.22)**	**223.9 (12.39)**	**819**

*Standard deviation is shown in parentheses.

Reading	JTPA	PROMISE JOBS	Both
JTPA			
PROMISE JOBS	*		
Both	*		

Math	PROMISE JOBS	Both	JTPA
JTPA	*	*	
PROMISE JOBS			
Both			

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for Table 12 - Iowa Population Mean Scaled Scores by Gender

Gender	Reading	Math	N
Male	234.8 (12.75)	224.9 (11.75)	173
Female	238.6 (11.92)	223.6 (12.56)	637
Total	**237.7 (12.22)**	**223.9 (12.39)**	**810**

*Standard deviation is shown in parentheses.

Reading	Male	Female
Male		
Female	*	

Math	Male	Female
Male		
Female		

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for Table 13 - Iowa Population Mean Scaled Scores by Age

Age	Reading	Math	N
≤ 18	231.3 (13.26)	221.9 (12.12)	145
19 - 25	240.8 (10.01)	225.6 (11.91)	232
26 - 29	240.1 (10.86)	224.3 (12.14)	121
30 - 39	239.3 (11.88)	224.3 (12.80)	203
40 - 49	236.0 (12.78)	221.8 (14.31)	61
50 - 59	234.8 (11.38)	223.8 (11.95)	20
60 +	226.5 (12.79)	222.1 (7.59)	24
Total	**237.7 (12.22)**	**224.0 (12.39)**	**806**

*Standard deviation is shown in parentheses.

Reading	≤ 18	19 - 25	26 - 29	30 - 39	40 -4 9	50 - 59	60 +
≤ 18		*	*	*	*		
19 - 25					*	*	*
26 - 29					*		*
30 - 39					*		*
40 - 4 9							*
50 - 59							*
60 +							

Math	≤ 18	19 - 25	26 - 29	30 - 39	40 - 49	50 - 59	60 +
≥ 18		*					
19 - 25					*		
26 - 29							
30 - 39							
40 -4 9							
50 - 59							
60 +							

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for Table 14 - Iowa Population Mean Scaled Scores by Ethnicity

Ethnicity	Reading	Math	N
White (Non-Hispanic)	238.7 (12.22)	225.1 (12.08)	688
Black (Non-Hispanic)	231.0 (8.79)	215.4 (10.56)	70
Hispanic	230.6 (10.74)	217.6 (13.63)	34
Other	237.4 (14.04)	223.2 (12.13)	19
Total	**237.7 (12.22)**	**223.9 (12.39)**	**811**

*Standard deviation is shown in parentheses.

Reading	White	Black	Hispanic	Other
White		*	*	
Black				*
Hispanic				*
Other				

Math	White	Black	Hispanic	Other
White		*	*	
Black				*
Hispanic				
Other				

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for Table 15 - Iowa Population Mean Scaled Scores by Aggregated Ethnic Groups

Ethnicity	Reading	Math	N
White (Non-Hispanic)	238.7 (12.22)	225.1 (12.08)	688
Non-White	231.9 (10.47)	217.2 (11.90)	123
Total	**237.7 (12.22)**	**223.9 (12.39)**	**811**

*Standard deviation is shown in parentheses.

Reading	White	Non-White
White		*
Non-White		

Math	White	Non-White
White		*
Non-White		

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for Table 16 - Iowa Population Mean Scaled Scores by Aggregated Native Language

Native Language	Reading	Math	N
English	238.0 (12.12)	224.0 (12.32)	787
Other	229.2 (11.09)	220.2 (12.58)	21
Total	**237.8 (12.22)**	**223.9 (12.39)**	**808**

*Standard deviation is shown in parentheses.

Reading	English	Other
English		*
Other		

Math	English	Other
English		
Other		

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for
Table 17 - Iowa Population Mean Scaled Scores by Highest Grade Completed

Highest Grade Completed	Reading	Math	N
≤ 8	229.1 (12.79)	217.4 (10.20)	97
9	233.2 (11.54)	219.1 (12.56)	107
10	235.8 (10.26)	224.1 (12.26)	114
11	237.0 (10.17)	220.7 (10.86)	118
12	241.2 (11.37)	226.3 (11.31)	288
13 +	245.7 (10.71)	233.6 (11.81)	86
Total	**237.8 (12.22)**	**224.0 (12.39)**	**810**

*Standard deviation is shown in parentheses.

Reading	≤ 8	9	10	11	12	13 +
≤ 8		*	*	*	*	*
9				*	*	*
10					*	*
11					*	*
12						*
13 +						

Math	≤ 8	9	10	11	12	13 +
≤ 8			*	*	*	*
9			*		*	*
10				*		*
11					*	*
12						*
13 +						

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for Table 20 - Iowa Population Mean Scaled Scores by Type of Degree Completed

Type of Degree Completed	Reading	Math	N
None	232.9 (11.60)	219.5 (11.32)	380
High School	240.6 (11.95)	226.4 (12.51)	239
GED	243.9 (9.12)	228.7 (9.98)	121
Vocational/Technical	246.0 (11.07)	233.2 (13.04)	21
AA	248.9 (9.08)	234.3 (13.33)	13
Other	241.1 (11.31)	231.9 (9.09)	22
Total	**237.7 (12.27)**	**223.9 (12.36)**	**796**

*Standard deviation is in parentheses.

Reading	None	High School	GED	Voc/Tech	AA	Other
None		*	*	*	*	*
High School			*	*	*	
GED						
Voc/Tech						
AA						*
Other						

Math	None	High School	GED	Voc/Tech	AA	Other
None		*	*	*	*	*
High School				*	*	*
GED						
Voc/Tech						
AA						
Other						

(*) Denotes pairs of groups significantly different at the 0.050 level.

Standard Deviations and Tables of Significance for
Table 21 - Iowa Population Mean Scaled Scores by Degree Completion

Degree Completion	Reading	Math	N
None	232.9 (11.60)	219.5 (11.32)	380
Completed	242.1 (11.19)	228.0 (11.88)	416
Total	**237.7 (12.27)**	**223.9 (12.36)**	**796**

*Standard deviation is in parentheses.

Reading	None	Completed
None		*
Completed		

Math	None	Completed
None		*
Completed		

(*) Denotes pairs of groups significantly different at the 0.050 level.

Appendix E: NALS Proficiency by Educational Attainment

Average NALS Prose Literacy for Varying Educational Attainment*

NALS Level	NALS Score	Sample Task	NALS Score	Educational Attainment
1	149	Identify country in short article	177	0 - 8 years of schooling
	210	Locate one piece of information in sports article		
	224	Underline sentence explaining action stated in short article		
2	226	Underline meaning of a term in government brochure	231	9 - 12 years of schooling
	250	Locate two features of information in sports article	**268**	**GED credential**
	275	Interpret instructions from appliance warranty	270	High school diploma
3	280	Write brief letter explaining error on credit card bill	**290**	**GED passers**
			294	Some college
	304	Read news article; identify sentence that provides interpretation of situation	308	Two-year degree
	316	Read lengthy article to identify two behaviors that meet stated condition	322	Four-year degree
4	328	State in writing argument made in lengthy newspaper article	336	Graduate studies/degree
	347	Explain difference between two types of employee benefits		
	359	Contrast views expressed in two editorials on automotive technologies		
	374	Compare two metaphors used in poem		
5	382	Compare approaches stated in narrative on growing up		
	410	Summarize two ways lawyers may challenge prospective jurors		
	423	Interpret brief phrase from lengthy news article		

*This chart was extrapolated from J. Baldwin, et al. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Figure 1.5a, p. 22.

Average NALS Document Literacy for Varying Educational Attainment*

NALS Level	NALS Score	Sample Task	NALS Score	Educational Attainment
1	69	Sign your name		
	151	Locate expiration date on driver's license	170	0 - 8 years of schooling
	214	Using pie graph, locate type of vehicle having specific sales		
2	232	Locate intersection on street map	227	9 - 12 years of schooling
	245	Locate eligibility from table of employee benefits		
	259	Identify and enter information on application for social security card	**264**	High school diploma, **GED credential**
3	277	Identify information from bar graph depicting source of energy and year	**289**	**GED passers**
	296	Use sign out sheet to respond to call about resident	290	Some college
	314	Use bus schedule to determine appropriate bus for given set of conditions	299	Two-year degree
	323	Enter information given into an auto maintenance record form	314	Four-year degree
4	342	Identify correct percentage meeting specified conditions from a table of such information	326	Graduate studies/degree
	348	Use bus schedule to determine appropriate bus for given conditions		
5	379	Use table of information to determine pattern in oil exports across years		
	396	Using a table depicting information about parental involvement in school survey, write a paragraph summarizing extent to which parents and teachers agree		

*This chart was extrapolated from J. Baldwin, et al. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Figure 1.5b, p. 23.

Average NALS Quantitative Literacy for Varying Educational Attainment*

NALS Level	NALS Score	Sample Task	NALS Score	Educational Attainment
1	191	Total a bank deposit entry	169	0 - 8 years of schooling
	238	Calculate postage and fees for certified mail	227	9 - 12 years of schooling
2	246	Determine difference in price between tickets for two shows	**268**	**GED credential**
	270	Calculate total costs of purchase from an order form	270	High school diploma
	278	Using calculator, calculate difference between regular and sale price from an advertisement	**284**	**GED passers**
			295	Some college
3	308	Using calculator, determine the discount from an oil bill if paid within ten days	307	Two-year degree
			322	Four-year degree
	325	Plan travel arrangements for meeting using flight schedule	334	Graduate studies/degree
4	350	Using information stated in news article, calculate amount of money that should go to raising a child		
	368	Using pamphlet, calculate the yearly amount a couple would receive for basic supplemental security income		
	375	Calculate miles per gallon using information given on mileage record chart		
5	382	Determine individual and total costs on an order form for items in a catalog		
	421	Using calculator, determine the total cost of carpet to cover a room		

*This chart was extrapolated from J. Baldwin, et al. *The Literacy Proficiencies of GED Examinees: Results from the GED-NALS Comparison Study*. American Council on Education and Educational Testing Service, 1995. Figure 1.5c, p. 24.

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