

# Using the ACT for Admissions and Placement at NTID<sup>1</sup>

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## Abstract

This paper summarizes findings of studies conducted at the National Technical Institute for the Deaf concerning the performance of deaf and hard-of-hearing students on the ACT Assessment. The paper describes the ACT Assessment, and presents normative information about performance of a national sample of deaf and hard-of-hearing test takers in addition to results of performance of students entering NTID. Results for the studies reported in this paper indicate that the ACT Assessment is valid when used with postsecondary level deaf and hard-of-hearing students seeking admission to two and four year colleges in the United States. Caution must be exercised when interpreting results when students score below 14 on the reading and English tests.

## Introduction

Most every college requires some form of testing, either for assisting with the admission decision, or with placement after admission. The National Technical Institute for the Deaf (NTID) is no exception. In 1969 NTID began using the Stanford Achievement Tests as a primary indicator of an applicant's academic preparedness to enter college. More than thirty years ago, when the

Stanford Achievement Test was adopted, about 60 percent of NTID applicants attended schools for deaf students where this test was widely used to assess annual achievement gains. At that time, it made sense to adapt the Stanford tests to assist with our admission decisions.

There have been many changes in the education of deaf students over the past 30 years. NTID has not been immune to these changes. First of all, today only about 25 percent of applicants for admission to NTID come from schools for deaf students; the remaining 75 percent enter from mainstreamed high schools or are transfers from other colleges. Many of the students applying from mainstream high schools do not have access to the Stanford Achievement Test, which means applicants often must make special arrangements to take the test battery.

Second, an increasing percentage of entering deaf and hard-of-hearing students are seeking admission to baccalaureate-level programs. The other colleges of Rochester Institute of Technology (RIT) require scores on the Scholastic Aptitude Tests or the American College Test (ACT) for admission. Currently, more than 40 percent of NTID's students are mainstreamed in programs with hearing students—up from only 25 percent just 10 years ago. The Stanford Achievement Tests did not provide the information necessary to make a decision concerning admission to the programs available through the other colleges of RIT.

Third, with increasing costs to both NTID and its applicants, it has been necessary for NTID to reduce its orientation program, called Summer Vestibule, from four weeks to 10 days. This re-

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duction has made it difficult to conduct the evaluations necessary to determine appropriate placement levels of entering students.

For these reasons, in 1996, NTID began searching for a test that would be accessible to students nationally, meet the needs for making quality admission decisions, and provide academic departments with information concerning the placing students in majors. At PEPNet 1998 we reported on preliminary studies conducted collaboratively by NTID and ACT concerning the use of ACT with deaf students<sup>1</sup>, and the decision by NTID to begin using the ACT for admissions beginning in September, 1998. This paper follows up on the studies conducted in 1996 and 1997 with information about our experience with use of the ACT during the past two years. This paper will cover the following topics:

- What is the ACT;
- National norms for deaf test takers;
- Comparing the ACT with other measures of academic performance;
- Use in determining initial degree level.

#### What is the ACT

The ACT Assessment is a composite of tests and questionnaires designed to assist college admission and placement personnel in making quality decisions about applicants. The battery includes four tests of educational development, the High School Course/Grade Information questionnaire, the ACT Interest Inventory, and the Student Profile Section.

The tests of *Educational Development* include four curriculum-based measures in English, mathematics, reading, and science reasoning. The tests are based on the major areas of instruction in American high schools and colleges. A student's performance has a direct and obvious relationship to his or her academic development. Scores on the tests of Educational Development range from a low of 1 to a high of 36 and can be interpreted as indicated below:

- 1 to 15 need significant preparation;
- 16 to 19 minimum level of performance to enter credit-bearing college courses;
- Average for college bound seniors is 20.<sup>1</sup>

The ACT also reports score ranges by institutional selectivity. Table 1 below provides the ACT mean composite scores by selectivity. Mean ACT composite scores of students from schools with open admissions are less than 16, while those with highly selective admissions are above 27. It is clear that there are significant differences in the ACT scores of students depending on the selectivity of the school they are entering.

Table 1  
Institutional Selectivity

<i>Selectivity Level</i>	<i>Mean ACT</i>
Highly Selective	>=27
Selective	22-26
Traditional	18-21
Liberal	16-17
Open	<=15

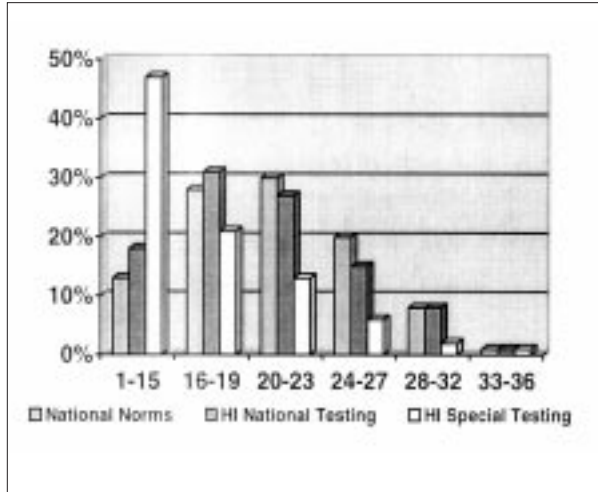
The *High School Course/Grade Information* questionnaire asks students who register for national test dates about the courses they have completed or plan to take in high school and the grades they have received. The 30 courses listed represent six major curricular areas—English, mathematics, natural sciences, social studies, languages, and arts. The courses include those that customarily form the basis of a college preparatory curriculum and frequently are required for college admission.

The ACT *Interest Inventory* is usually completed when students register for the ACT Assessment. The 90-item questionnaire results in six scales, each based on 15 questions which parallel Holland's six interest and occupational types: Science, Arts, Social Service, Business Contact, Business Operations, and Technical. Students and counselors can use results from the Interest Inventory as a basis for career exploration.

The *Student Profile* section collects nearly 200 questions of information in 12 categories related to students' educational and vocational aspirations, plans, abilities, accomplishments, and

Figure 1

*ACT Composite Scores for two groups of deaf and hard of hearing test takers compared with national ACT norms.*



needs. These data are useful to college and university personnel in planning curricular and co-curricular services for entering students.

### National Norms

The ACT reports scores for the four sub-tests (English, reading, mathematics and science reasoning). It also provides an overall performance score called the Composite Score. In the interest of space limitations, only the composite score will be used for all analyses in the remainder of this paper.

Figure 1 provides a breakdown of ACT composite scores for two groups of deaf and hard-of-hearing students and a national sample of high school graduates (National Norms). One group of deaf and hard-of-hearing students took the test with hearing students under normal testing conditions (HI National Testing). The second deaf and hard-of-hearing group was tested using the special testing arrangements for disabled test-takers (HI Special Testing). It can be observed that deaf and hard-of-hearing students taking the ACT under special testing conditions perform significantly lower than deaf and hard-of-hearing students taking the test under regular scheduled testing. This difference is indicative that there may

be reasons why special testing was chosen for these students. The score distribution for deaf and hard-of-hearing students taking the testing under regular conditions is similar to national normative distributions.

### ACT and Other Measures of Academic Performance

Immediately upon enrollment at NTID students are administered a series of tests the results of which are used to place them in appropriate levels of developmental instruction in mathematics, English, and reading. Since these placement tests and the decisions resulting from their administration are currently used independent of the ACT, an opportunity exists to evaluate whether the ACT might be useful in making placement decisions. This is one way of assessing the validity of the ACT related to placement of students in various aspects of the curriculum.

Table 2 lists the correlation coefficients of the language, reading and mathematics components of the ACT with measures regularly used for placement at NTID: the reading comprehension subtest of the California Achievement Tests, the Michigan Test of Language Proficiency, and a mathematics placement test. All of the correlation coefficients easily exceed the .01 level of statistical significance.

Table 2

*Correlations of ACT and SAT scores with placement tests for entering NTID students.*

	ACT
<i>Language</i>	English
Michigan	.72
NTID Writing	.66
<i>Reading</i>	Reading
California	.61
<i>Mathematics</i>	Math
NTID Mathematics	.71

In mathematics, English, and reading entering students are assigned to five levels of skill proficiency, which are related to requirements for admission to various levels of study. These levels are as follows:

- Level A = Fundamental preparatory curricula;
- Level B = Preparatory curricula;
- Level C = Entry into AOS, Diploma courses of study;
- Level D = Entry into AAS, AS courses of study;
- Proficient = Entry into studies at the Bachelor level.

Students at levels A and B are not considered prepared to begin studies in any degree program offered at NTID. Those in level C are generally prepared to enter programs where the outcome is an AOS or diploma that requires minimal academic work in liberal arts areas such as freshman composition, humanities, and social studies. Level D students should be prepared to take entry level college courses, while those scoring at the Proficient level should need no remedial work in English, reading or mathematics, and should be prepared to begin work at the bachelor level.

*Mathematics.* When a student enrolls at NTID, the mathematics department administers a test which measures basic computational and mathematics skills. The results of this test, in combination with a student interview, have been used to assign a mathematics level to each student. Table 3 presents ACT mathematics means and standard deviations for the mathematics placement levels.

Table 3

*ACT mathematics scores by placement level for students admitted to NTID.*

Placement Level	ACT	
	Mean	SD
Level A	13.8	1.56
Level B	14.8	1.89
Level C	17.7	1.90
Level D	19.5	2.66
Proficient	22.9	2.50
Correlation with Placement Level .77		

It is clear from studying the mean scores and the correlation coefficient that the ACT Mathematics Test discriminates among the mathematics placement levels. The mean ACT score of 13.8 and 14.8 at levels A and B indicate that significant preparatory work is still needed before students begin to pursue any academic work requiring application of mathematics skills. These findings are similar to the standards for transition reported by ACT for interpreting score results.

*Reading.* In the area of reading, NTID uses a combination of the reading comprehension subtest of the California Achievement Test and a vocabulary test to assign students to a proficiency level for reading. Table 4 presents the mean ACT scores for students assigned to each of these levels. Results in table 4 indicate that the reading subtest of the ACT is not able to discriminate between levels A and B, while separating students at levels C through Proficient. The ACT reading test appears not to be sensitive for deaf and hard-of-hearing students scoring below 14, and thus may not be useful for assessments of students with very poor reading skills. This finding is supported by the relatively low correlation between the placement levels and the ACT reading score.

Table 4

*ACT reading scores by placement level for students admitted to NTID.*

Placement Level	ACT	
	Mean	SD
Level A	13.3	2.71
Level B	13.0	2.81
Level C	14.3	3.14
Level D	16.2	3.78
Proficient	21.0	4.90
Correlation with Placement Level .58		

Table 5

*ACT English scores by placement level for students admitted to NTID.*

Placement Level	ACT	
	Mean	SD
Level A	12.4	3.99
Level B	11.8	2.69
Level C	13.3	3.02
Level D	17.1	4.40
Proficient	19.0	4.06
Correlation with Placement Level .44		

nation between levels A and B. As a matter of fact, students at level A score, on average, somewhat higher than those placed at level B. This fact causes the overall correlation between ACT English and placement level to be relatively low. Like the reading test, the ACT is probably not sensitive for deaf students scoring below 13 in English, many of whom are scoring at or just above the chance level for the test. For levels C through Proficient, however, scores are in keeping with the reported standards for transition used by ACT for interpreting scores.

It is clear from these results that caution must be exercised when using the results from the ACT Assessment for placement in remedial courses for deaf and hard-of-hearing students scoring below 14. If we make the assumption that the assignments to the NTID levels have validity, then the ACT is not able to discriminate for students needing considerable remedial work before entering course work in an academic setting.

#### Determining Entry Degree Level

Another goal of this study was to determine how well the ACT could discriminate among various levels of degree placement for students entering NTID. Students can be placed into five degree levels depending on their academic preparation: Bachelor of Science, Associate of Applied Science, Associate of Occupational Studies, Diploma, and Preparatory studies. Students entering in 1998 and 1999 were placed in these levels without using the ACT scores. This permitted researchers to evaluate the ability of the ACT in discriminating among these five levels. Mean composite ACT

Table 6

*Mean ACT composite scores by entry degree level for new 1997 NTID students.*

Degree Level	Mean	95% Confidence
<i>Bachelor</i>	21.8	21.1 to 22.5
<i>Sub-bachelor</i>		
AAS	17.6	16.2 to 18.9
AOS	15.0	14.5 to 15.5
Diploma	13.8	13.2 to 14.5
<i>Preparatory</i>	14.1	13.4 to 14.8

scores for each entry degree level are displayed in Table 6.

The ACT generally yielded distinctly separate means for four of the five entry placements. Statistical tests indicate that there are significant differences for mean ACT scores between Preparatory/Diploma, AOS, AAS, and Bachelor level students. It is also noteworthy that there is little overlap among the levels of degree placement. These results indicate that the ACT can be used for counseling students concerning the level of degree outcomes they can expect, given their level of performance on the ACT.

#### Summary of Findings

This paper has reported on studies conducted at NTID concerning use of the American College Test (ACT) for accepting students and placing them into programs of study. The results indicate that the ACT is a useful test for assisting with admission and placement of deaf and hard-of-hearing students at the postsecondary level. The following are some key findings documented in these studies.

*Normative information.* Deaf students being tested under special conditions perform significantly less well than deaf and hard-of-hearing students tested under regular conditions. Students entering NTID have score distributions similar to the national group of deaf and hard-of-hearing students tested under special conditions. In addition, it appears that the ACT can accurately discriminate between

students who fully meet NTID academic admission criteria and those who need developmental instruction before entering a program of study.

*Relationship with other measures.* The findings indicate that the ACT subtests are correlated with other measures of academic skills administered at NTID and used for placement into remedial courses. The findings indicate the mathematics test correlates very highly with independent placements, while the tests of reading and English appear to not be useful with students scoring on the low end of the ACT distribution between 10 and 14. Caution must be exercised in using the ACT results for making placement decisions with such students.

*Determination of entry degree level.* The analyses indicated that the ACT discriminated among students at four of five-degree levels at NTID. It was not able to distinguish among students placed at the diploma and preparatory level. This finding

may be due to the fact that students placed at the preparatory and diploma levels have English language skill levels that are below the level that the ACT was designed to assess. Despite this inability, the ACT certainly can be used for determining which students need remedial help, those who are ready to begin some academic studies, and those who can become fully matriculated at the college level. Generally, our findings indicate, based on independent testing, that normative information presented by ACT seems to apply equally to deaf and hard-of-hearing students entering NTID.

End Note

1. For more information the reader is referred to ACT's *Educational Planning and Assessment System, Standards for Transition*, P.O. Box 168, Iowa City, IA 52243-0168, (319) 337-1040.