



The Sensitivity of the ACT to Instruction

E. F. Lindquist, ACT's co-founder, laid the foundation for the ACT® in 1958, stating that it was much more important for an admissions test to measure what students could do with their intelligence than to simply measure their intelligence (Lindquist, 1958). Measuring what students have learned, Lindquist suggested, would allow many more uses of the test results than simply college admissions.

Consistent with Lindquist's intent, the ACT is an educational achievement test that measures the typical content and skills learned from college preparatory curricula. Consequently, the ACT can be used not only to predict college success, but also to provide direct feedback to high school teachers about the effectiveness of their teaching. ACT results also assist teachers in adapting instruction to individual students, and assist high school administrators in evaluating their educational programs. Perhaps most important is that ACT results show a student exactly what skills he or she needs to improve upon. In short, the most profound advantage of the ACT is not its predictive validity, but rather the information it provides to intervene and to improve students' chances to do well in college. If students receive good guidance and counseling, take rigorous college preparatory courses from good instructors, and study hard, they can do a lot to increase their achievement and their level of preparation for college.

Since the ACT is a curriculum-based test, how students perform on it depends to a large extent on the courses they take and how well they master their course work. National ACT trends show that students who take a college preparatory core curriculum in high school typically score 2-3 points higher (on a 1-36 point scale) on the ACT subject area tests (in English, mathematics, reading, and science) and the Composite than those who do not (ACT, 2004). At many high schools, however, even students who take college preparatory core course work may not be ready for college-level courses. ACT research shows that three-quarters of ACT-tested graduates who take the core curriculum are prepared for college-level English Composition. However, less than 50% are ready for College Algebra or Biology. Percentages are even smaller for African American, Hispanic, and Native American students.

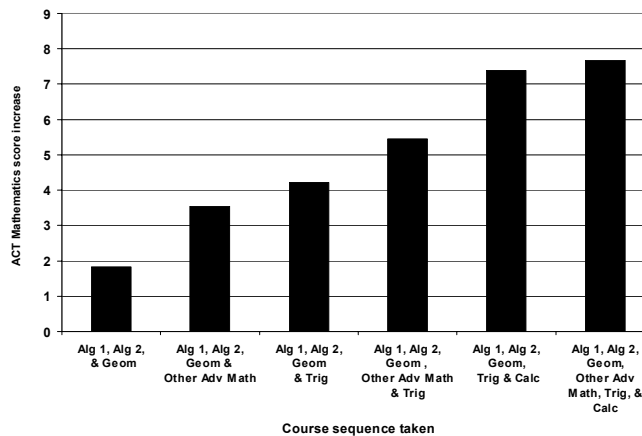
Current ACT research shows that students' academic preparedness for college, as measured by their ACT scores, is the result of the specific courses they take, not just the numbers of years they take (ACT, 2004). Moreover, taking more advanced courses increases the likelihood that a student will be prepared. These findings were obtained using the high school GPAs, ACT scores, grade level at the time of testing, and high school course work taken for over 1 million ACT-tested 2004 high school graduates. This information was used to show the effects of taking particular course sequences on ACT English, Mathematics, and Science scores, regardless of students' prior achievement and grade level.

The Benefits of Taking Specific Courses

Taking English in grades 9 through 11 (English 9-11) is typically associated with a .8 point increase in ACT English score, compared to students taking less than English 9-11. Moreover, taking one or more foreign languages in addition to three years of English is associated with an increase of over 2 points, compared to taking only English 9-11. The relatively small increase for English course work alone is likely due to the fact that most students take these courses. In comparison, foreign language course work, like the ACT English test, has a strong grammar component.

Even larger effects of course taking are evident for ACT Mathematics scores, as shown in Figure 1. Students taking Algebra 1, Algebra 2, and Geometry typically score 1.8 points higher on the ACT Mathematics test than students taking less than Algebra 1, Algebra 2, and Geometry. In comparison, students taking these three courses plus Trigonometry and Calculus, or Trigonometry, Calculus, and Other Advanced Math, typically score 5½ points higher on the ACT Mathematics test than students taking the three mathematics courses only.

Figure 1: Average Increases in ACT Mathematics Scores by Math Course Work Taken



In science, taking Biology averages a .6 point score increase in ACT Science scores, compared to taking only General Science. Taking Biology and Chemistry, compared to taking only Biology, is associated with an average ACT Science score increase of 1.3. Taking Biology, Chemistry, and Physics is associated with an even larger increase: Students taking all three science courses score, on average, 2.6 points higher than do students taking only Biology.

Across racial/ethnic and gender groups the results follow similar trends: Taking one or more foreign languages, upper-level mathematics courses, or upper-level science courses is associated with substantial increases in average ACT English, Mathematics, and Science scores.

Other EPAS Programs

The ACT program is supported developmentally by the PLAN program at grade 10 and by the EXPLORE program at grade 8. All three programs are consistent in philosophy, structure, and development; they comprise the Educational Planning and Assessment System® (EPAS). Consistency across these programs

is reflected in the research on the effects of course work between EXPLORE at grade 8 and PLAN at grade 10. Students who take college preparatory mathematics and science courses in high school achieve higher PLAN Mathematics, Science, and Composite scores than those who do not take these courses (Roberts & Noble, 2004). These results are true regardless of students' prior achievement (as measured by EXPLORE), their race/ethnicity or gender, and the high school they attended. For example, students taking Algebra II typically achieve PLAN Mathematics scores that are 1.5 points higher than those of students not taking the course. Students taking Geometry achieve PLAN Mathematics scores that are an additional 1.4 points higher than those who do not take Geometry.

Conclusions

The ACT measures the knowledge and skills that are taught in high school and that are necessary for success in college. It provides a standardized, objective measure of what students know and can do. Its philosophy, structure, developmental process, and the research evidence underlying its uses all support this claim.

Taking specific course sequences in high school has a direct effect on students' ACT scores, and thus on their preparedness for college-level course work. In particular, taking a foreign language and upper-level mathematics and science courses is associated with significant increases in ACT English, Mathematics and Science scores. This is true regardless of students' prior achievement and grade level at the time of testing.

These findings are of critical importance to students, parents, teachers, and counselors as students plan their high school course work, especially those students who plan to enroll in college. The results are also relevant for school/district administrators and policymakers as they evaluate high school curricula.

References

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