

*What Does It Really Mean to Be College and Work Ready?
The Mathematics and English Literacy Required
of First Year Community College Students*



Q&A

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AAAS

What are the key findings of this report in a nutshell?

Overall, the report found that the expectations that our community colleges have for the academic accomplishments of first-year students are very low. Those students are asked to do very little writing. What little writing they are asked to do is typically of the simplest sort. The reading they are expected to do is well below the level at which their textbooks are written. Very little of what is taught in high school math courses is actually used in first year community college courses. The mathematics that is used is elementary and middle school mathematics, and it turns out that high school graduates do not have a very good command of elementary and middle school math. And we found that some of the math that is actually needed by students in many community college programs—for example, complex measurement and the ability to read and interpret schematic drawings and charts—is not taught in our schools. The textbooks students use in the first year of community college are written at the 11th and 12th grade levels, but it turns out that the texts that high school students use are written at considerably lower grade levels, which may explain why they are having trouble reading the community college texts. Some states are now requiring high school students to pass Algebra II to graduate, but it turns out that the typical College Algebra course consists of topics usually associated with Algebra I and a few topics from geometry and statistics—overall, about Algebra one-and-a-quarter. Clearly, one does not have to master Algebra II in order to study Algebra I. The college placement tests that are used by most community colleges to decide who has to take remedial courses are routinely denying students access to credit-bearing courses on the basis of students' lack of ability to do math that they will not need in the first year of their community college program. While the expectations of community college instructors are much lower than many people might have assumed, the authors point out that a large fraction of our community college students cannot meet those expectations. While it seems clear that community college expectations have to be raised, the authors caution the reader that the first priority should go to improving the capacity of high school graduates to meet the current community college standards.

What makes these studies different from other studies conducted on college and career readiness?

Most studies of what college students should know and be able to do are based on surveys and focus groups in which college faculty are asked what students need to know and be able to do in order to be successful in their courses. But this method is notoriously faulty, because the

faculty members typically respond by talking about what they would like students to know and be able to do, rather than what is actually needed. This is the first study that has actually looked at the evidence by gathering and analyzing textbooks, tests, assignments, student work and teachers' grading of this work to piece together a portrait of what first-year students are actually expected to do.

How do you know the seven institutions selected are representative of the country as a whole?

The institutions were selected randomly from a diverse group of seven states and serve a mix of urban, suburban and rural communities, with enrollments ranging from 3,000 to 30,000. Our objective was to use a small but representative group of institutions to do a deep-dive analysis into the demands of some of the most popular and varied programs of study found in community colleges today, from business to nursing to criminal justice to automotive technology and IT. Our investigation was complemented and strengthened by the creation of expert panels for each of the two studies composed of distinguished community college faculty members, as well as leading subject matter experts and scholars in the field. Both studies also benefited from oversight by NCEE's Technical Advisory Committee, whose members include many of the nation's leading psychometricians, cognitive scientists, and curriculum experts.

We have shared these results with community college leaders and researchers, and they have universally confirmed our findings. But we would welcome further research designed to replicate this study in larger samples of community colleges.

Your studies draw a lot of conclusions about high school curriculum and college and career preparedness, but your report really only focused on courses at the community college level. How can you draw such sweeping conclusions?

First, community colleges enroll close to half of all students going to college in this country. Second, our community colleges are the principal venue for vocational education in the United States. The students who go to community colleges are roughly evenly divided between those who enroll in vocational programs and those who enroll in programs designed to enable them to transfer to four-year colleges. So it can reasonably be said that our community colleges are a main gateway both to college and work for a very large fraction of the American people.

Your report draws a lot of conclusions about what is required for success in our community colleges, but you only studied the requirements of the first-year programs. What conclusions can reasonably be drawn about the success of these students in successfully completing a community college program?

Research conducted by the College Board shows a very close correlation between success in the first year of a community college program and the likelihood of successfully completing a community college program.

By suggesting community college students shouldn't take Algebra, aren't you arguing for dumbing down standards, instead of more rigorous standards? Doesn't this contradict what the Common Core State Standards are all about?

This report is hardly an argument for lowering standards. In fact, it shows how low the standards actually are in both our community colleges and our schools. Throughout, it validates the Common Core State Standards' call for higher standards of literacy in both

mathematics and English. In particular, it calls for students to be able to read more demanding and complex texts in all subjects of study, to be able to argue a point in a compelling, logical way in their writing and to marshal the available evidence to make that point, to comprehend the texts they have been assigned and to make use of the information they gain from those texts to solve the kinds of complex problems they will be confronted with in their chosen line of work. It calls for students to master the mathematics they will need in their community college work, having pointed out that many have not mastered it when they graduate from high school. Throughout, the recommendations in this report are generally consistent with the Common Core State Standards, and call for standards far above the generally prevailing standards in both English and mathematics. With respect to Algebra II, the report points out that only a small minority of students will need Algebra II to succeed in their community college program, and, indeed, only a small minority will need Algebra II to succeed in the workplace. The report suggests that, instead of insisting that all students master a math course that only a few will ever need, our high schools offer pathways through mathematics that are appropriate for the directions they intend to pursue when they leave high school.

Won't people who are pushing hard for students with strong STEM skills be concerned about your recommendations with respect to Algebra II?

They should not be. The purpose of Algebra II in the curriculum is to prepare students for the calculus which is in turn a core requirement for people pursuing most STEM careers. That sequence consists of Algebra I, Geometry, Algebra II, Pre-calculus and Calculus. However, fewer than five percent of American workers need the calculus to do their work. On the one hand, it seems unreasonable to require everyone to take a subject that fewer than five percent will ever need, on the other hand, we think it is very important to create a high school math sequence for the students that will need calculus in the work they will do. We also think it is equally important to create other math tracks in high school for students who have other career plans. These may also require demanding mathematics, but different mathematics.

So the report says that students are studying the wrong things in school if the aim is to get them ready for college and work. What does that mean?

In mathematics, students need to spend more time on middle school math and be in less of a rush to get to Algebra II, which only a handful will ever need, so they really understand the concepts underlying middle school mathematics in a way that will enable them to apply what they are learning to the kinds of complex real-world problems they will face when they join the workforce. A better understanding of middle school math will also lay a firmer base for learning more advanced mathematics later on. Students also need to spend more time learning how to take real-world problems and translate them into a form in which they can be solved mathematically. They need to be able to interpret and use schematic diagrams and do complex measurement, skills that are rarely taught in our schools now. In both mathematics and English we need to see both high schools and colleges challenging students with tasks of higher conceptual demand rather than the modest expectations now set for them. For example, in English there should be more attention to writing that requires students to not just describe what they have read, but to fashion an argument and marshal evidence to support that argument.

If the demands on students' ability to write in community colleges are meager, why are you concerned about the writing they are not doing in high school?

Our study found that the colleges require very little writing from their first-year students. But one of the most widely voiced complaints among both employers and four-year college instructors is that their employees and students cannot write very well. The most plausible explanation for the lack of writing demand in our community colleges, therefore, is not that community college instructors think their students write well enough to meet all future challenges, but rather that the high school graduates they are teaching are not capable of writing very well and so they are reluctant to demand very much writing from them. If community college instructors in the occupational program areas think their students do not read or write well, they are more likely to adjust their expectations downward than to turn themselves into instructors of reading and writing. So the short answer to the question is that the lack of demand for writing in the community colleges is not likely to reflect a judgment that little or no writing skill is required in the workplace. There is every reason to believe that there is writing demand in the workplace and in our four-year colleges that is not being met either in our schools or our community colleges.

Why should we care about these findings?

Community colleges have been getting increasing attention as they are rightly seen as critical to a healthy workforce and the nation's economic prospects. But these findings suggest that our community colleges will not be able to play that role unless they raise their standards and they will not be able to raise their standards until the schools send them much better educated graduates. Because community colleges supply the majority of skilled workers requiring less than four years of college and a large and increasing fraction of those who will go on to get a four-year degree, the nation's employers are heavily dependent on these institutions for their supply of skilled labor. And a majority of our postsecondary students who come from minority and low-income families are dependent on these institutions to provide them with the skills they need to earn a decent living.