

**“INFORMED SELF-PLACEMENT” AT AMERICAN RIVER
COLLEGE: A CASE STUDY**

by

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May 2007



National Center Report #07-2

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Foreword

“Informed math self-placement,” a program implemented at American River College in Sacramento, California, to determine students’ readiness for college-level math, has been in place for three years. This case study describes the development and implementation of math self-placement at American River. Math self-placement consists of a Web-based testing and information site that allows students, or potential students, to gauge their level of math proficiency prior to talking with a counselor or enrolling in classes. Math faculty members and administrators are hopeful that self-placement, as an alternative to traditional placement, will provide students with concrete knowledge and experience about math standards, since self-placement includes actual self-assessment instruments (tests), developed and approved by the college’s math faculty.

American River’s experience in math self-placement is noteworthy in its potential to clearly communicate with current and prospective students about college-level math expectations. It is also noteworthy that it serves as the mechanism to bring faculty members together in order to agree upon math standards and link them to the placement process and to the courses that students are expected to take for college-level mathematics.

The National Center would like to thank the administration, faculty, and staff at American River for discussing their program with us and for sharing the data available on its effectiveness. We would also like to thank The William and Flora Hewlett Foundation for their support of the case study research at American River College.

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Introduction

Placement tests in mathematics and English Language Arts represent the de facto math and English standards at community colleges. Students take math and English placement tests when they arrive on campus to help them find courses that match their skill levels. The math tests assess students' skills in pre-algebra, algebra, geometry, trigonometry, calculus, and other subjects. In English, reading comprehension and vocabulary questions comprise the test. Placement tests help counselors and instructors determine which courses new students should take.

The placement process at community colleges is critical for several reasons.

This research project, funded by The William and Flora Hewlett Foundation, complements a study supported by the James Irvine Foundation to determine the academic expectations in mathematics and English-Language Arts for recent high school graduates enrolling in the California community colleges. It investigates whether entry-level community college academic standards are similar to those standards assessed in the 11th grade in California high schools. Then it recommends steps that California can take to align high school standards with community college standards.

Community colleges are open-access institutions that serve a heterogeneous student population. Students range from high school dropouts to high school graduates to adults returning to pursue a college degree. Students are not required to apply and some come without high school transcripts, so community colleges need a way to measure their abilities. Placement tests play the essential role of sorting these students into classes. For students, placement is a high stakes test that can impact their college outcomes. Students starting at the lowest developmental courses have the furthest to go to be ready for transfer to a four-year college or to earn an associate's degree. Nearly 90% of students starting in a developmental course never pass a transfer-level course ("developmental" is used interchangeably with "non-transfer-level" and "remedial" in this analysis).

American River College (ARC) is one of a few colleges in California that has replaced the traditional placement model with an "informed self-

placement" in mathematics. Instead of placing students into courses based on test scores, self-placement is designed to match ARC math course content. Students select the level of math test that they believe best matches their skill levels and get results on the computer immediately following the test. Depending on the results, students may take additional easier or more difficult tests to determine their readiness for specific college-level courses. Counselors use placement test results to advise students which course is most appropriate. The examination of "informed self-placement" was supported by The William and Flora Hewlett Foundation in order to better understand self-placement at ARC and how self-placement might be used as a signal to high school students of community college standards.

Methodology

The research team consisted of a researcher from Stanford University and two staff members from the National Center for Public Policy and Higher Education.¹ They completed a literature review on self-placement, reviewed ARC self-placement documents, and interviewed ARC faculty, staff, students, and administrators. Previous research summarized self-placement as: “The power that directed self-placement taps is the desire among new college students to get started on the right foot and to finally make some personal choices about their education (Royer and Gilles, 12).”²

The research team also reviewed five documents on self-placement from the institutional research office of ARC.³ The first was written prior to self-placement and explains the concerns with the use of COMPASS, a test designed by ACT, for placement purposes, gives examples of other colleges that implemented self-placement, and states the case for ARC to adopt informed self-placement. The next document described self-placement at ARC. The third compared course selection and student success under COMPASS and self-placement.

The researchers also reviewed documents related to assessment and placement issues in California for contextual information. They included documents of assessments used in California, preparation of high school students, and how to measure basic skills.⁴ Another paper reviewed technical information on assessment in the California Community Colleges.⁵

Prior to a site visit at ARC, the research team ran simulations of self-placement tests. The first step was to review the background questions for structure and content. Next they analyzed the five placement tests including the additional questions at the end of each test. Sample background questions are provided in Appendix A. The elementary algebra placement test is provided in Appendix B and the trigonometry placement test appears in Appendix C.

Researchers interviewed 20 staff members over two days on the ARC campus in October 2006. They spoke with math faculty, English faculty, institutional researchers, a

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² The researchers read “Directed Self-Placement: An Attitude of Orientation” by Daniel J. Royer and Roger Gilles, which discusses the self-placement implemented at Grand Valley State University in Allendale, MI, September 1998.

³ *Informed Self-Placement: An Attractive Alternative to Conventional Assessment Practices* by James Barr and Cathie Browning ARC Institutional Research Office, January 2003; *Online Informed Self-Placement for Math* by James Barr, February 2005; *Math Self-Placement: A Preliminary Evaluation* by Jim Barr and Cathie Browning, ARC Institutional Research Office, October 2006; *Are Community Colleges Underprepared for Underprepared Students* by Jim Barr, ARC Institutional Research Office, June 2006; *Key Effectiveness Indicators: American River College Five-Year Profile 2001-2002 to 2005-2006 Fall 2006* by ARC Research Office, Sacramento, CA, November 2006.

⁴ *Issues in Basic Skills Assessment and Placement In the California Community Colleges* by the Academic Senate for California Community Colleges, Fall 2004.

⁵ *Questions and Answers on Assessment for Use in the California Community Colleges* by the California Community College Assessment Association, March 2005.

counselor, a student, a matriculation coordinator, an assessment center administrator, the math dean, the vice president, and the president. Each interview consisted of semi-structured questions and lasted 30 to 60 minutes. Researchers asked some of the same questions to different interviewees to triangulate responses. The interview question matrix appears in Appendix D.

One of the study limitations is that less than two years of self-placement data is available, which restricted the researchers' ability to reach quantitative conclusions. Also the research office did not have detailed cost data to compare the cost-effectiveness of self-placement with previous placement exams. Additionally, there is no external evaluation of self-placement to compare with the information provided by the ARC research office. Even though the data comes from ARC documents and staff interviews, the study describes self-placement in detail along with its strengths, weaknesses, and future potential.

ARC Student Demographics

ARC is one of four open enrollment colleges in the Los Rios Community College District in the greater Sacramento area. Cosumnes River College, Folsom Lake College, and Sacramento City College are the other three colleges in the district. The four colleges offer associate's degrees in 70 career fields to a total of nearly 80,000 students.

As of spring 2006, ARC enrollment was 32,863 full- and part-time students. Approximately half are white, 14% are Hispanic, 9% are African American, and 9% are Asian (see Table 1). More than three-quarters of students are part-time and the majority of those take fewer than six credits per semester or the equivalent of one or two courses. About two-thirds of students take classes during the day with the remainder taking courses in the evening, over the weekend, or online. ARC serves students of all ages, the majority of whom are older than the traditional 18- to 24-year-old student.

Ethnicity	% of Students	Age Group	% of Students
African American	8.6	Under 18	1.6
Asian	8.6	18 – 20	20.7
Filipino/Pacific Islander	3.4	21 – 24	21.3
Hispanic	13.5	25 – 29	15.6
Native American	1.4	30 – 39	19.4
White	49.8	40+	21.4
Other/Unknown	14.7	Awards	# Awarded
Unit Load	% of Students	Associate's Degree	1,547
Light (0.5 to 5.5)	53.3	Certificate	320
Mid (6.0 to 11.5)	28.4	Course Enrollment	% of Students
Full (12 or more)	18.3	Day	67.2
Gender	% of Students	Evening	23.7
Male	50.3	Weekend	3.7
Female	49.7	Online	5.4

Note: Enrollment data from spring 2006 (32,863 full- and part-time students)
 Source: ARC *Key Effectiveness Indicators* Report, fall 2006

Self-Placement at American River College

Beginning courses at the right level is critical, given how briefly many students are enrolled in community colleges. An ARC researcher explains, “About 50% of the students will be gone within one year, and that’s kind of state and national level as well. And if you look at the progression from two levels below English or math up to transfer-level, that number stayed static. It runs about 10 to 14% across the state.” At ARC, the math department elected to involve students in the placement process through self-placement while English relies on the College Test for English Placement (CTEP) for placing students in courses.

Mathematics Self-Placement

In March 2004, ARC introduced math self-placement as a comprehensive online test. Prior to self-placement, ARC used COMPASS, a test designed by ACT, to place students into math courses. Before COMPASS, the math department used the Math Diagnostic Testing Project (MDTP), developed by a group of California colleges, for placement purposes.⁶

The first step on the self-placement test is to enter personal information and student ID number. Next, a series of background questions include reasons for enrolling in college, history of math course taking, number of hours spent at work, extracurricular commitments, and study habits. Students respond to these questions using a multiple choice dropdown menu. The final questions ask students whether they agree or disagree with general statements such as, “I like math; I enjoy being in school; I am good at focusing on difficult tasks.”

After completing the background questions, the user is directed to a screen that shows the sequences of math courses offered at ARC. Courses are mapped, progressing from easy to difficult with transfer-level courses highlighted in blue boxes. Students can use self-placement only to place into non-transfer-level courses. Transfer courses require transcripts that show the required prerequisites, although students can take self-placement to assess their skills for transfer-level courses. There are five non-transfer-level courses ranging from computational arithmetic to intermediate algebra. Transfer-level courses include trigonometry, statistics, and various calculus offerings. Below the course listings are reminders to take courses in order and not to enroll in courses that are too difficult. Table 2 shows where each math class falls among the five self-placement tests.

⁶ At other colleges in the Los Rios district, Folsom Lake College and Cosumnes River College both use the MDTP. Sacramento City College uses ACCUPLACER, which is a computer adaptive test developed by the College Board.

Table 2. Course Distribution Among the Levels of Self-Placement	
Placement Test	Courses
Level 1	Pre-Algebra
Level 2	Elementary Algebra
Level 3	Elementary Geometry, Intermediate Algebra
Level 4	Intro to Mathematical Ideas, Intro to Symbolic Logic, Mathematical Discovery, Trigonometry, Calculus for Business and Economics, Modern Business Mathematics, Calculus for Life and Social Sciences, Pre-Calculus, Problem Solving, Introduction to Probability and Statistics
Level 5	Calculus I, Calculus II, Calculus III

Note: Levels 1–3 are developmental level courses and levels 4–5 are transfer-level courses.

Next, students are ready to take the self-placement test. All levels are multiple-choice with five answer choices, and the number of questions for each test varies from six to 13. Before the assessment, a statement appears on the computer screen in red letters warning that students should already be able to answer the questions that follow in order to enroll in the course for which they are being assessed. It also states that the student should be able to answer the questions in 15 to 20 minutes or they may want to consider an easier course. Upon completing the test, students see the percent answered correctly and predicted grade for the course, but not the correct answers.

Once students complete the assessment for the course in which they are interested in enrolling, they have the option of viewing more questions at the same level, trying a different level test, or finishing the assessment process. If the questions are too easy or too difficult, students have the option of going back and selecting a different level. Once students have seen enough questions, they are asked to select a course. Before they make a final decision, the assessment tool reminds them of their previous math experience and self-placement test results. Once the student makes a decision, the program provides a certificate of completion with their answers to the background questions, performance on the assessment, and course selection. Students must print out their placement results for their counselor meeting and to show the instructor on the first day of class.

English Self-Placement Fails to Gain Faculty Support

ARC administrators were also interested in designing an informed self-placement for English. The English department had been considering self-placement at the same time as the math department, but could not agree on the test content. Instead of self-placement, English replaced COMPASS with CTEP, which was developed by a writing instructor at another California Community College and is more cost-effective than COMPASS. One staff member explained, “We dropped the COMPASS because there was kind of a general consensus among a lot of us that looked at assessment for years that no assessment test appeared to be doing any more effective job than any other. So it made sense to just get the cheapest one. CTEP was about one-fifth the cost of COMPASS.”

The primary reason English did not adopt self-placement is that instructors disagreed about content. Faculty members could not reach consensus on grading rubrics for essays and student learning outcomes. Although they have discussed rubrics and are

being forced to agree on student learning outcomes for accreditation, the department remains divided. An ARC researcher said that the best predictor of student performance in any English course is the instructor. One professor explains his concern about grade variation among faculty:

Part of the problem is that as with every English department across the nation, there's a huge problem with grade variation among faculty. That's really been my interest—over three years I've been looking at finding a way to standardize the way that we assess student writing so that grades might reflect more accurate commonly held standards and reduction of variation. The outcome assessment might become more meaningful and you get a better picture of how our placements are performing.

One veteran English instructor sees all placement tests as flawed in some way. However, of all the instruments reviewed, she liked CTEP because it is cost-effective and it places students into classes fairly accurately, in her view. Other professors, however, were skeptical of self-placement because they have not seen research proving it works.

Another issue dividing the English faculty was whether students understood their reading and writing abilities well enough to place themselves in the right course. Several professors felt that students routinely overestimate their writing abilities, and self-placement would crowd transfer-level classes and erode standards. One professor explained, "I think that most of us felt that many of them would go straight into 300 because that's the first transfer-level class whether they were prepared or not prepared, so I think that was probably the biggest concern." Other English instructors disagreed and thought students could benefit from making their own placement decisions. One professor asked, "If you want to make students into critical thinkers, shouldn't they have the option to choose where they begin? You could show students a group of representative papers and then they ask themselves, can I write like that?" This structure would require students to have an understanding of how well they write.

All students planning to take an English course must take CTEP. It is offered in campus computer labs at the beginning of each semester. Based on their score, students place into one of the developmental level or transfer courses. Developmental courses are English 51 and 102, and courses numbered 300 and above are transfer-level.

Who Takes Math Self-Placement?

The online mathematics self-placement tests are open to all students at ARC who are interested in taking a math course. When students are selecting courses for the upcoming semester, they can take the test online at a campus computer lab or from their home. High school students can also access the test to see how well prepared they are for college-level math courses. Finally, it can serve as a diagnostic tool for adults who have not taken a math course recently, but plan on enrolling in one at ARC and need to assess their skills.

Some students are required to take self-placement, while it is optional for others. The test is mandatory for students who haven't taken a math course in the past two years. The test is optional for students who have earned a C or better in a college-level course within the past two years. Despite this, counselors recommend that all students considering a math course take self-placement.

For students planning on enrolling in a transfer-level course, self-placement is only informational. A transcript with the necessary prerequisites is required for entry into transfer-level courses. Students who satisfy the prerequisites for a transfer-level course are welcome to use self-placement to test their level of preparation for the course. Non-transfer-level courses are open to all students, and self-placement is designed to help students assess their skills and select the appropriate course.

Preliminary Results from Math Self-Placement

Data for self-placement is available for the six terms from fall 2004 through summer 2006. Over that period, 4,881 students enrolled in a math course at ARC, based on the results of self-placement, out of the 20,396 who took the test. The most relevant comparative test to self-placement is COMPASS, which is developed by ACT. Counselors used COMPASS results to place students into math courses at ARC prior to 2004.

When comparing success rate in first course following the placement test, results from COMPASS and self-placement are similar. Researchers at ARC define success as scoring an A, B, C, or earning credit for a course. At two, three, and four levels below transfer, 50% to 60% of students passed the course they placed into both on COMPASS and self-placement. In intermediate algebra, which is one level below transfer, approximately 60% of students passed the course whether they took COMPASS or self-placement. The aggregate non-transfer-level pass rate in the course following self-placement is 58% compared with 57% for COMPASS (see Table 3).

Math Level	Self-Placement	COMPASS
Computational Arithmetic	57.8%	54.0%
Pre-algebra	58.7%	58.0%
Elementary Algebra	57.5%	55.4%
Elementary Geometry	50.0%	71.0%
Intermediate Algebra	58.3%	61.0%

Source: *Math Self-Placement: A Preliminary Evaluation* by ARC Institutional Research Office
 Note: Red number indicates low sample size.

Self-placement is most practical for students at the developmental level, which accounts for 90% of math students at ARC. The five developmental math classes are computational arithmetic, pre-algebra, elementary algebra, elementary geometry, and intermediate algebra. Quite often, students at the developmental level have not taken a math course recently and could benefit most from self-placement. Although the math department wants all students to take self-placement before enrolling in their first math course, many non-matriculated students taking fewer than six units do not take the test. A matriculation officer estimates that only 25% of non-matriculated students take placement tests.

Given that few students make the transition from developmental to transfer-level courses, starting college in remedial courses is risky. Statewide, nearly 90% of students

who start in developmental level math or English courses never reach transfer-level. If students start in courses where they have the skills to succeed and sufficient academic support, the challenge is to increase the percentage that stay enrolled to complete their degree or transfer to a four-year college.

The study was designed to answer the following questions: How does math self-placement at ARC compare with COMPASS⁷ (a placement test designed by ACT and used previously by ARC)? What was the impetus for creating self-placement? To what extent does self-placement engage faculty in curricular reform? What is known about efficacy of the self-placement? To what extent does it affect student likelihood to enroll? Can self-placement play a role in aligning high school and college standards? How are students reacting to self-placement?

Findings

Self-Placement vs. COMPASS

In 2003, the research office released a report showing that COMPASS was doing a poor job placing students into courses appropriate to their academic skill levels. The research office found low and in some cases negative correlations between COMPASS results and student success in the subsequent course. For example, students who scored below the cut score in intermediate algebra were having more success in the course than students who scored at the cut score. As a result, some faculty became skeptical about the math course placement accuracy of COMPASS.

Not all faculty members were convinced that COMPASS was to blame. One faculty member who preferred COMPASS said, “When we decided on this process I thought that we didn’t really do a good study. That there was a half-hearted test that showed a negative correlation for the COMPASS test and student success in courses. I don’t think we gave it a chance for a good study and putting it all together, and at the time I was disappointed with that.” This was the minority view among math instructors, and the allure of finding a more cost-effective test that could place students more accurately convinced the department to try self-placement.

Although self-placement and COMPASS are both computer tests, they are structured differently. COMPASS is a timed computer adaptive test that adjusts to each student’s ability. The difficulty level of questions varies depending on how many the student answers correctly. By contrast, self-placement is not timed and each test offers each student the same set of questions. The questions remain the same regardless of how many a student gets right or wrong. Also, students select the math course for which they want to be assessed and they can choose multiple levels.

Another concern instructors had was about content differences between COMPASS and the ARC math curriculum. Self-placement content was developed by ARC faculty, and COMPASS content was created by ACT. A member of the faculty research team explained that questions on COMPASS did not match the classroom content. One faculty noted: “The COMPASS test didn’t really test for [trigonometry] at all and it was placing students in pre-calculus and calculus without checking trig. The information that’s available to potential calculus students now is pretty [trigonometry]

⁷ Sample COMPASS questions are provided in Appendix E.

heavy.” Since ARC faculty control self-placement content, they can keep it aligned with the math course curricula.

Furthermore, COMPASS is an electronic test that cannot be modified, so ARC instructors could not edit or add questions. Thus, the department was not able to make their desired content changes. By contrast, ARC math faculty developed self-placement, which allowed them to match test content with course standards. While COMPASS could assess subject skills, self-placement offers students course previews.

One of the major changes from COMPASS is that self-placement gives students more input into the placement process. With COMPASS, students took the test and counselors used the results to place students in a math course. Self-placement is designed to help students select a course. An administrator explained, “Students become much more active participants in the process versus just sitting in the counselor’s office and just taking whatever the counselor says, and they have more engagement and play a role in that final decision.” Self-placement signals a paradigm shift from a prescriptive process where students were placed into math courses to an inclusive process where students are involved in selecting math courses.

Self-placement tests offer students unparalleled convenience and flexibility. COMPASS was offered only at set times in the campus assessment computer lab. With self-placement, students can use the lab when it is open, but most take the test at home. With fewer students using the campus computer lab, ARC has extra resources that can be used to benefit students in other ways. One staff member said that they’ve “been able to cut down the number of people needed to run the lab,” which allows them to put the extra money into tutoring or other academic support services.

The online availability of the test offers potential benefits to prospective students and high school teachers. High school students can use self-placement to find out whether their math skills meet ARC standards. Adults in the community considering returning for a college degree can test their skills online. Teachers from feeder high schools can use self-placement to compare the curriculum of their courses with ARC standards. This creates potential for better content alignment between high school and community college courses.

Although self-placement offers the convenience of testing at home, the supervised test conditions of COMPASS are lost. Some faculty members expressed concern about the validity of student results under self-placement. “They can go to the Web site, take the test once, twice, three times, and they get to know the answers, know what to say, and bring that to the instructor.” When students take placement tests in the campus computer lab, staff checks their identification. By contrast, students who tested at home could have somebody else take the test for them or collaborate. Math instructors encourage students to give themselves an honest self-assessment so they can place into a class that matches their skill level.

Another concern that led ARC to switch from COMPASS to self-placement was costs. An institutional researcher explained, “When we went to COMPASS it cost us \$100,000 for the lab, \$43,000 for a network specialist to run it, and then about \$50,000 a year for seat costs to take the test.” Furthermore, new versions of COMPASS could mean expensive computer upgrades. The startup costs for self-placement included paying two faculty members for reassigned time and paying programmers to develop the online test. Ongoing costs include maintaining and improving the test and research and analysis of

test data. In the long run, self-placement would appear to be more cost-effective than COMPASS. As an administrator explains, self-placement allows ARC to have better control of costs: “When you have a vendor, versions change. When we have a programmer, we can prioritize and move it to the top of our list or say it’s more important to do that initiative this year whereas we felt like we were more at the mercy of our vendor under COMPASS.”

Developing Self-Placement

Prior to implementing self-placement, the math department was concerned about the high cost of COMPASS and was skeptical about its effectiveness. The ARC Institutional Research office found a negative correlation between scores on COMPASS math and student success rate in subsequent courses, so the department started to consider alternatives. At the time, Moorpark Community College in Southern California was using self-placement for math, English, and ESL. ARC invited faculty from Moorpark to discuss their self-placement process. Shortly thereafter, the math department decided to develop self-placement tests.

In fall 2003, two ARC math faculty members were given release time from teaching to begin developing the self-placement tests. They collaborated with counselors and other math instructors to develop the background and content questions. For the background questions they “took an everything plus the kitchen sink mentality of not leaving any questions out and tried to group the questions in a way that made sense.” These included questions on history of math course taking, confidence in math abilities, comfort with math, and other time commitments. One faculty member explains:

If a student comes to you and says I’m only taking this one class, I work 10 hours a week, live at home, my parents are supporting me, I may not have done very well last time, but I’ve already hired a tutor. Here’s somebody who thought about it, whose score may not be wonderful but has obviously got the motivation and has everything set up. When a student comes to my office because he’s already failed a course twice they have to petition to take it a third time. And my question always is ‘what would be different this time?’

The main purpose of adding the background questions was to get students to think hard about whether they were prepared for a course before enrolling. It probed into important areas such as how much time they’ll have to study, whether they’ve taken the prerequisites, and how recently. The test printout has the student’s answers to the questions and is useful when speaking with a counselor. The counselor plays the critical role of discussing each student’s test results to help them select a math class where they have the ability to succeed and enough time to study.

For the content questions, the two math instructors worked with colleagues in the department to develop questions. For any given course, the placement test asks questions from the course one level below. In describing the tests, one staff member said, “The problem sets are basically like representative exit skills that they should have under their belt, which in turn became entrance skills. They’re like prerequisites.” For example, for a student considering taking intermediate algebra, the self-placement would assess their beginning algebra skills. Students can test their skills at any of the five different levels covered by the self-placement, and one staff member described it this way: “So it’s kind

of like if we were putting out a bunch of different shoes for them to try on and they could try them on.”

The content questions are designed to find out whether students have the foundation for the course they are considering. The main concern of faculty and counselors is that students have familiarity with the questions on the self-placement. Answering all of the questions correctly is not as important as understanding what they are asking. Counselors believe that if students have had the prerequisites but are rusty on a few concepts, they will be able to refresh their memory as the course proceeds.

The math faculty came together to create the content questions for the different levels of self-placement. An ARC researcher explains, “The math faculty got together at each level and created a group of 30 problems that covered what they should know from the level below for the class they were going into. If it was intermediate algebra, we took them to the end of the semester of beginning algebra.” This forced instructors to agree on standards and align self-placement questions with their curriculum.

The Web site has not changed since it was designed in 2004 and some faculty members believe it lacks sophistication. A faculty member explains, “When I poke around on the Web, when I go to Math Excel, which is a for-profit, and I see other Web sites out there, I feel like what we have is drawn with a crayon, it’s so primitive. A lot more could be done.” For example, many pages are cluttered with text and could be redesigned in a more user-friendly format. The multiple choice questions are displayed awkwardly and could be condensed and presented more professionally.

Faculty Engagement in Curricular Reform

Math faculty members generally agree that developing self-placement brought the department together to discuss how the curriculum would appear on the tests. The chair stated, “The questions that were put on the assessment test were compiled by the department and, yes, we do feel as a department that it’s representative of college-level work.” Although full-time instructors contributed to creating questions for self-placement, adjuncts were less involved. “Unfortunately not a lot of them are able to attend because this is their second job and they have a regular job, so they are excluded, not voluntarily, but it’s just something that happens.” Even though they were not involved in creating the tests, adjunct faculty members are just as satisfied with self-placement as full-time instructors.

Another benefit of developing self-placement has been an improved relationship between math faculty and counselors, particularly on issues of placement. A dean observes:

I think one role [of self-placement] is dampening this relationship between math faculty and counselors because every semester as math dean some faculty would storm my office and say ‘look at this’ and they had a student where the counselor in their kind, good-hearted way had signed the slip saying a student could sit in statistics and the faculty member looks at the student’s first quizzes and it’s like ‘share with me your background’ and they haven’t had math in ten years and they didn’t do well back then and they’re trying to get to [Sacramento] State next semester and have got to have that stat class, and the students in the math faculty’s opinion are setting themselves up for failure instead of success. This is a

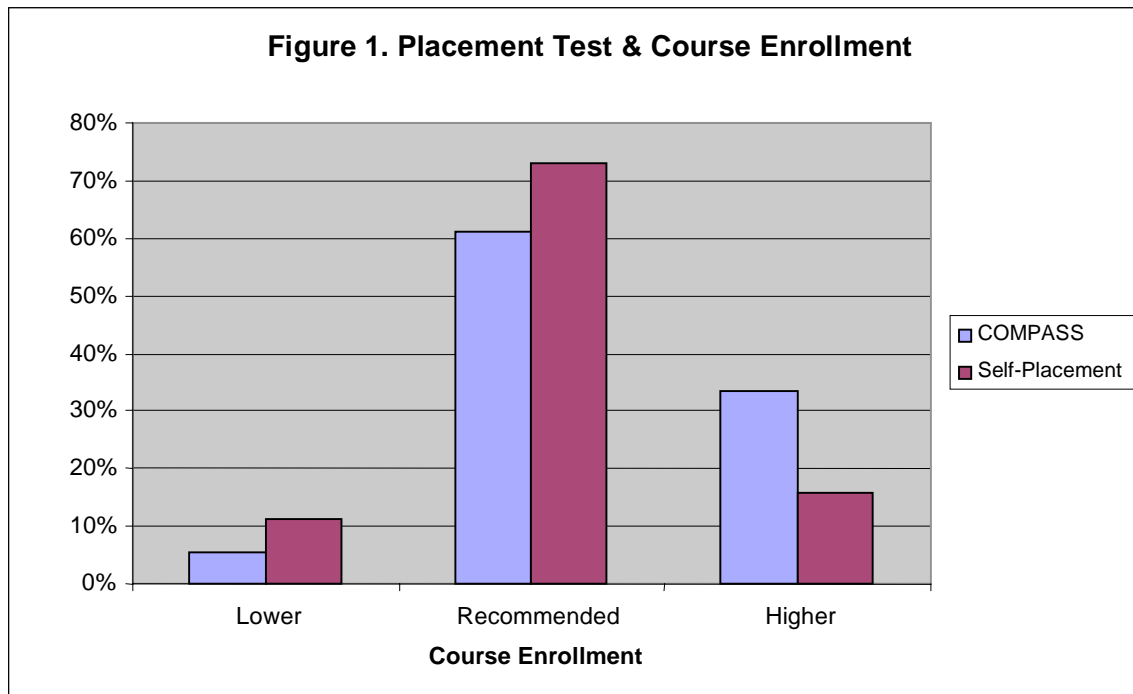
chronic, ongoing problem, this dichotomy between caring for the students versus their true success in the classroom, so having this program I sense a lessening of that antagonistic attitude and the counselors.

Faculty now have input in the placement process as authors of the self-placement. Now that students are making placement decisions, the process has achieved balance between faculty, counselors, and students.

One faculty member is concerned that the department has not revised self-placement since it was developed. He explained, “I think two or three years ago there was more of a common perspective and since then because of the lack of research, work on the assessment system has sort of stopped.” With a few more years of data, the department will likely receive more analysis to help determine how the test could be improved.

Placement Efficacy

ARC analysis of the first two years of data suggests that students are placing themselves into lower level classes with self-placement than counselors used to place them under COMPASS. More than four out of five students are placing themselves at the level self-placement recommends or below. Previously, 95% of students were placed at the level recommended by COMPASS or above (see Figure 1).



Source: *Math Self-Placement: A Preliminary Evaluation* by ARC Institutional Research Office

For some students, self-placement exposes weaknesses and tells them which areas need improvement. A staff member explained, “...and they’d say ‘I want to stay down here and build these skills so that I can, because I do want to go into something that’s going to require math and I want to strengthen myself.’ So they tended to resist going up, rather they would tend to want to go down.” Although this means spending more time

taking developmental classes, students are not setting themselves up to fail by taking courses that are too difficult.

Within a few years, self-placement will have a sample size comparable to COMPASS, which will allow the research office to make a fair comparison of the two tests. As one of the ARC researchers explains, “At the current time, we only have 3,000 students in the developmental level, and I was comparing that against, say, 10,000 in COMPASS.” Math instructors are eager to see data from the research office so they can improve self-placement. A matriculation officer commented, “Once we get more information [from the research office] about what’s working and not working, and there are some trends and indicators, I think the [faculty] is very anxious to go back and look at it.”

Counselors see the test as a critical tool for placement conversations with students. A counselor commented, “I strongly urge all of the students that I deal with to take [self-placement] anyway even if they’re looking for the transfer-level, just to confirm what was going on in their high school situation, because we’re still dealing with that uncertainty.” Along with checking students’ skill levels, self-placement forces students to think about how their math course will fit in their daily schedule. “How much did you study? Where are you working? What other things are going on in your life? Well, it starts to put some of those issues of success on the table that they need to confront, and oh yeah, I took the class okay, but I never really dedicated myself to it, and this is a whole different world.” The self-placement background questions enrich the student-counselor conversation by forcing students to think realistically about how much time they can allocate to their math class.

Does Self-Placement Impact Student Enrollment?

Faculty had mixed reactions about whether the test would intimidate students and decrease their likelihood of enrolling. Of the first 13,000 students who have taken self-placement only 4,000 have enrolled. There are a few reasons why the enrollment rate could appear lower than it looks. First, many students who take the test are intimidated by math and delay enrolling in a course. A faculty member explains, “Part of the difficulty is they take the test and then they don’t enroll in math next semester. Some wait two years from the time they take the test before they enroll in the class.” When students eventually enroll, many have forgotten concepts and are not as well prepared for the course as they once were. Another reason enrollment numbers could look artificially low is that some students take self-placement to test their math skills and are uncertain whether they will enroll in a math course.

One question that remains unanswered is whether students who take self-placement on campus enroll in math courses at higher rates than students who assess from home. When students test on campus, a lab administrator is there to encourage them. One of the lab technicians said, “I know I’ve had students that said, ‘I got a D.’ I usually encourage students to go home, do some reviewing, and then take it again. That seems to reduce some of that anxiety.” Students who fail self-placement at home could become discouraged. A matriculation officer explains the contextual difference between testing at home and on campus:

I think it depends on how the student was introduced to it. If the student was introduced to it through our assessment center, they do a very good job explaining to students exactly how the assessment was put together, the purpose of it, and how they can use it to their benefit. It's not an actual test that you pass or fail—it's just to give you an idea of what your skills are. A student doing it from home online without any of that contextual information and support—yeah, I can see how it would be intimidating.

There is no analysis yet on enrollment rates for students testing on campus compared with students testing at home.

One math faculty member doubts that self-placement would negatively impact enrollment rates. He explained, "I don't think I'd reach that conclusion. I think coming in to the assessment center, sitting down and taking the COMPASS test would be at least as intimidating and probably an order of magnitude more so." The assessment center could intimidate some students more than testing from the comfort of their home. Enrollment growth in the past five years suggests that self-placement is not deterring prospective math students. Between 2001 and 2006, math enrollment grew 2.5% compared with 0.5% enrollment growth for the entire college.

K–16 Alignment

Self-placement has the potential to substantially improve the connection between high schools and community colleges. If math and English both had online self-placement tests, high school students could develop a better understanding of community college standards. It would also give high school students time to improve weaknesses before starting college. High school teachers could develop a better understanding of community college curricula and collaborate with instructors to align the curriculum between high school and college.

Since self-placement mirrors the ARC math course content, it could help reveal curriculum gaps between high schools and colleges. For example, self-placement has helped math instructors at ARC realize that students are leaving high school with limited understanding of trigonometry. A researcher at the college explains:

We're hearing from high school students that they're realizing that their high-school courses don't articulate with our courses, so trigonometry, for example, in high school might have only covered two-thirds of the material that we would expect the student to cover to use that course as a prerequisite. So they're stumbling onto the fact that maybe their high-school courses don't represent what we call the same course here, and that's been very helpful to students, we've heard.

A counselor agrees: "While this school may say that the student is in analysis, this one may say the student is in trigonometry, this one may say it's pre-calculus." Although self-placement has exposed articulation problems in math, staff members are also aware of curriculum gaps in other subjects. A researcher explains, "Kids take high-school chemistry thinking they're ready for [chemistry] 1A, and 80% of them aren't."

Despite faculty awareness that students leave high school unprepared for college-level work, instructors at ARC know little about high school curricula. One staff member at ARC explains, "I've served for a number of years on the high school articulation

council, and it seems like it's just an annual event. We don't know what you guys teach in your English and math courses." Part of the problem may be that instructors are focused on teaching and have no opportunity to learn about the curriculum in high schools.

None of the ARC faculty members interviewed for this project knew any details about the 11th grade California Standards Tests (CST) in math and English. Faculty members said that high school standards tests are out of their domain, so they have not compared high school standards to ARC standards. It is surprising that ARC instructors are not familiar with CST standards, since they could benefit from finding out what is emphasized in the high school curriculum. If high schools and community colleges developed a mutual understanding of each other's standards, they would be able to improve curriculum alignment. As the math department at ARC revises self-placement, they can work to align its content with CST.

Furthermore, ARC has not made an effort to inform high school students about self-placement. Part of the problem is that ARC does not have a presence on high school campuses. An instructor explains, "We haven't gone out of our way to pitch that to high school students to say we are online, because we are not directly involved in the high school." As it is now, the only way a high school student could find out about self-placement at ARC is through a friend. If ARC wants high school students to take advantage of self-placement exams, they will have to make a greater effort to collaborate with local high schools.

Alignment problems between high schools and ARC exist primarily in the advanced math courses. A faculty member explains:

The algebra courses aren't really the big issue for us in terms of what the high schools are doing. What the math faculty have discovered is that we have difficulty with the preparation level of students who allegedly took pre-calculus, math analysis, or calculus at the high school level because those courses do not align with the information covered in our courses.

From introductory to advanced courses, ARC instructors cannot trust that students have mastered the content of their high school courses. "We know what marks on an advanced placement test a student has to have before we'll accept it here. Because you can take the whole year of advanced placement and really not learn. You need a 3 or higher [on the AP test to get credit at the college-level]." Most ARC students did not take AP math courses, so self-placement is useful for informing instructors of their students' skills at the beginning of a course.

Student Reaction to Self-Placement

ARC has not collected data on student opinions of self-placement. However, one student spoke to the research team and a few others provided written comments. One objective of self-placement is to give students a general idea of how well they understand the concepts. A student who was deciding between pre-calculus and trigonometry said, "I don't know necessarily if it was that the questions were daunting, it was just that they dealt with concepts like the whole sine and cosine and tangent and dealing with circle concepts." The self-placement test clarified that his foundation was not strong enough for pre-calculus, so he enrolled in trigonometry. Prior to the pre-calculus self-placement test,

he had taken the intermediate algebra self-placement test and done well. After taking two of the tests, he discovered which course best matched his skills.

The self-placement also benefited this student because he could preview the curriculum in the courses he was considering. Prior to self-placement, course curricula were not as readily available to students. He explained, “The only other way that I could have known about the content of the course would have been to go hunt down the instructor and ask them for a book, go over questions, which I may or may not have done since it would have been intensive to find someone, office hours and back then, I wasn’t that outgoing of a student.” Unless students had the opportunity to speak with an instructor before the first day of class, they had to rely on their counselor’s advice. Since counselors place students in many different subjects, it is unlikely that they could offer students the same depth of content information that comes with self-placement tests.

Ideally students take self-placement before enrolling in their first math course. A student who did not use self-placement said, “It is my belief that if I had taken a math self-assessment earlier, I could have avoided years of anguish over math and would be a lot further along in my education now. Mr. Richardson and ARC have given me the tools I need to succeed in this subject that has long given me grief.” This student failed her first course because it was too difficult and then one semester later she finally enrolled in the right course. Self-placement can get students to the proper course right away so they can avoid taking courses that do not match their skills.

Although most feedback has been positive, one complaint is that self-placement does not accommodate all types of learners. One student said, “The test was ok, but because I have a learning disability it doesn’t show what I really know and is not accurate for me.” Although this student did not find the necessary support, self-placement is not timed and offers students with learning disabilities better opportunities for assistance than COMPASS. Support and advice is available from Disabled Student Program Services along with math faculty and other students.

One faculty member who polled students is concerned about indifference toward the test. When he went in to math classes and asked students for their opinions, many were reluctant to respond. He explained, “One kid would say it was easy, or another kid would say I did it from home, or another kid would say the power went out when I was doing it. They’re not thinking deeply while doing it; they’re just sort of bumping up against it and using it for what it’s worth.” If the students gave more substantive feedback, the faculty would have a better idea of how to improve the test.

What Could Be Improved?

Faculty members have expressed interest in making revisions, but are waiting to see analysis from the research office. One change that has been discussed is adding more questions. The tests range from 6 to 13 questions with an option at the end to view additional questions. Students receive a predicted course grade based on their percentage correct. A faculty member explains, “From assessment, there was a point students were looking at our assessment with only six items or less than 10 items and we were hearing, ‘Is that all?’” Some students would like to answer more questions before selecting a course.

Another content change that has been discussed is providing answers at the end of the test. Presently, students only find out how many they got right. One faculty member observed, “I know I’ve had students—it doesn’t give them any feedback—all they can do is just view the questions at that point and we don’t have answers supplied, and when we relook at things we may change that.” It would be helpful for students to see how they could have solved problems that they missed.

Faculty members have different views about how to revise the background questions. One of the instructors who led test development said, “We’d like to shave down the number of questions asked in that survey.” Before they prune questions it is important to see research on which ones are effective. Another staff member would like to see the background questions become more individualized:

I’d also like to start to include some things about learning styles and other things that would help them decide on a class—they go in there with some other information about themselves as learners to help them become more successful in a class or know what kinds of support they’re going to need and should be looking for getting. When we look at those questions we’re always thinking how could we develop them into more of a profile as a learner?

Personalizing the test would require knowledge of what learning styles match the different courses and instructors.

One faculty member talked about adding free response questions. He explained, “Our questions are multiple choice, so there are only so many ways you can go, but there’s an interface built into Math Excel where it presents the problem and the graphics come out correctly every time and then it says, ‘Type your answer here,’ and you actually have to type it in—it’s closer to being free response.” Adding free response questions would require software that could evaluate free response answers. He added, “To really do this right, you need some high quality programmers.” Adding free response would also require faculty to meet and agree on new test questions.

One faculty member is concerned about the lack of supervision associated with self-placement. She said, “I would like it, if possible, to be taken at a testing center and given one opportunity and then I think they would get more accurate results. I don’t know if that’s possible.” Requiring students to test on campus would compromise student flexibility, which is currently one of the benefits of self-placement. An estimated 77% of students take self-placement off-campus, so reverting to supervised tests in the campus computer lab would be a major shift.

Summary of Findings

1. Placement is a critical policy lever to encouraging student success, but is limited in determining student outcomes.

Before further analyzing self-placement, it is worth noting that placement is important in determining the level where students start within a course sequence, but has limited influence on student outcomes. Regardless of where students start, teaching, student services, and many other factors impact whether students earn associates degrees or transfer to four-year colleges. Nonetheless, self-placement has the potential to improve

accuracy in placing students, increasing departmental collaboration, and improving alignment of college standards with high school content and assessments.

2. Self-placement involves students in placement decisions and gives them more influence on their education.

Under COMPASS and previous placement tests, students took the test and counselors placed them using the results. Therefore, test developers at ACT had a lot of influence in placement decisions and students had very little. With self-placement, instructors influence placements by designing the tests, counselors provide guidance, and students make the placement decisions. Self-placement entails a paradigm shift from a prescriptive process where students are placed into courses into an inclusive process that involves students in placement decisions.

3. Placement test decisions are decentralized to the departmental level.

There is no standardization of placement tests in California community colleges. The colleges in the Los Rios district use various placement tests, and community colleges across the state have discretion to choose their own placement tests. At ARC, administrators deferred placement test selection to the departmental level. The math department decided democratically to adopt self-placement. By contrast, English faculty rejected self-placement and continue to disagree on college-level readiness for English. Decentralization of placement has resulted in different placement standards at all of the 109 California community colleges. By contrast, with faculty cooperation, the California State Universities (CSU) administration centralized placement decisions systemwide.

4. The development of self-placement can be a tool for faculty to reach consensus on course standards.

The process of developing self-placement brought faculty together and gave them the opportunity to reach consensus on course standards. It also gives instructors a reason to periodically review alignment between self-placement and course content. Dissent, however, among English faculty caused them to miss an opportunity to establish grading rubrics and standard learning outcomes for courses. Although most instructors favored a writing sample, they could not agree on common writing standards. Regardless of the placement test, some instructors doubt that incoming students are prepared to accurately assess their reading and writing skills.

5. Self-placement has un-utilized potential to align community college placement exams with high school standards and assessments.

Self-placement offers the potential for curriculum alignment between high schools and community colleges. Although ARC has not made an effort to align self-placement with high school standards and assessments, when instructors revise self-placement tests, they will have the opportunity to cooperate with Sacramento area high school districts.

ARC has not offered self-placement to high school students as a tool to determine whether they are prepared for college-level math. One option would be to collaborate with the CSU on their Early Assessment Program (EAP). The EAP tells 11th graders in California whether they are prepared in math and English for introductory courses at a CSU. The EAP gives high school students a year to improve their weaknesses and it clearly communicates CSU standards. ARC could either align its standards with the EAP or promote self-placement as an assessment tool for high school students.

6. Students are placing themselves into easier math courses under self-placement than they used to be placed under COMPASS, while English faculty are concerned that students would place themselves too high under self-placement.

The first 18 months of data on self-placement show that students are placing themselves into easier math classes than counselors used to under COMPASS. The benefit of starting in easier classes is that students will be more likely to understand concepts and may be less likely to drop out. The tradeoff is that students starting with the easiest classes need to take more courses to reach transfer-level. ARC math instructors prefer students to take more courses to reach transfer-level than to start in courses that are too difficult and struggle.

A group of English instructors is concerned that if ARC adopted self-placement, unprepared students would place themselves into transfer-level courses. They feel that students do not understand their reading and writing abilities well enough to place themselves. Given the math department's experience, students want to enroll in courses where they can succeed. If the English department could reach consensus on self-placement content and a rubric to assess writing samples, it would be worth giving students the opportunity to assess their skills and place themselves.

7. Self-placement tests are aligned with ARC math course content, but may only partially cover course topics.

The math department logic behind the brevity of self-placement tests is that they are designed to give students an idea if they are ready for any given course. Regardless, it is doubtful that self-placement tests cover topics broadly enough to alert students whether they are ready for a course. The five different tests range from 6 to 13 multiple-choice questions. If there were 20 to 30 questions, the tests would cover more content areas and provide students with a more comprehensive assessment of their skills.

8. The cost-effectiveness is not known, but self-placement offers students excellent flexibility.

ARC paid each time a student took COMPASS, which added up to approximately \$50,000 each year. The assessment center where COMPASS was administered cost \$100,000 to build along with annual staff and maintenance costs. By contrast, there is no per-test cost when students take self-placement and more than 75% of students test from home. It is uncertain how much ARC will have to pay faculty to revise the test on an ongoing basis. Other costs include the research office, which provides analysis of test

results to the math department. ARC could not compare the cost-effectiveness of self-placement and COMPASS.

Self-placement gives students the freedom to test anywhere 24 hours per day. With COMPASS, students had to test in the assessment center when it was open. The tradeoff to greater flexibility is students take self-placement without supervision. Students took COMPASS in a proctored assessment center, so the math department could be sure that test results were valid.

9. The background questions at the beginning of self-placement are a useful tool for probing issues related to student commitment and mental preparation for a course.

Questions that probe student math course taking history, study habits, course schedule, work schedule and motivation are useful for students and their counselors. They force students to think carefully about factors that could impact their likelihood for success in a math course. They challenge students to think about key questions like how much time they have available to study before they start a course. Within a few years there should be sufficient data to determine which questions are most helpful to students when making course decisions.

Self-Placement: Questions to Consider for Improvement in Policy and Practice

1. What is the relationship between placement decisions and success in the subsequent course?

While self-placement shows promise to communicate clear standards of college readiness to students, it is not yet clear that better placement leads to improved course success rates or higher completion rates. As ARC continues to collect data on self-placement, the research office will be able to address this issue. Nevertheless, it is possible that self-placement could improve persistence if linked to other retention efforts such as academic advising.

2. Can self-placement be a tool to help faculty gain insight into student readiness and to periodically review the curriculum?

One of the essential features of math self-placement is the feedback that the institutional research office provides for the math department. It is important for departments to know whether students are using self-placement to place themselves properly and which questions are most effective. Faculty agreement on course sequences and standards is important in developing and revising self-placement. At ARC, the math department was able to reach agreement on standards while the English department was not. The result is that math self-placement reflects the content students need to succeed in math courses. English selected the CTEP based on costs because faculty could not agree on self-placement content or a rubric to assess writing samples. This raises serious questions about whether departments should have the authority to select placement tests.

3. Can self-placement place students into courses more accurately than commercial tests?

Currently there are 6 to 13 questions on each self-placement test. This may not be enough questions to give students an understanding of their abilities and feel confident about making placement decisions. Would additional content questions improve self-placement tests? The background questionnaire in self-placement gathers information about students and the relationship of factors other than academic preparation, such as time available for study, time spent working outside school, and motivation. It raises important questions about how personal and external factors affect student academic performance. Does self-placement help students better assess their commitment to math and time available to study?

4. To what degree can self-placement be used to communicate college-level standards to high school students?

Since self-placement is online, it has the potential to offer high school students and teachers a preview of community college standards. Furthermore, it could be a vehicle to improve curriculum alignment between high schools and community colleges. This challenges high schools and community colleges to collaborate to improve the transition for students.

5. Are college students prepared to make placement decisions?

Some math faculty discussed the benefit of empowering students to make placement decisions. If students make their own course decisions instead of being placed into a course, some instructors speculate that students will be more motivated in their courses. Conversely, English instructors were more skeptical about whether students can accurately assess their reading and writing skills. English faculty members are worried that students would overestimate their abilities. If students are going to place themselves into math and English courses when they enter community college, they need tests that can help them accurately assess their skills.

6. What are the implications of self-placement for policy and practice at the community college and K–12 district and state levels?

Self-placement has the potential to allow schools and colleges to communicate standards across the district to raise questions about differences. Additionally, self-placement could be a tool to establish statewide standards for entry-level college work. Self-placement tests could provide an impetus for local community college districts and high school districts to cooperate. At the state level, the K–12 state board has the opportunity to work together with the community college Board of Governors to use self-placement as a vehicle to align standards and assessment between the two levels.

Appendix A: Self-Placement Background Questionnaire

Step 2 - Summarize your background and experiences.

Your math strengths, background and study skills should influence your choice of a math class.

Remember, it is important that you be honest as you answer these questions. **Your answers will not be used to limit your choice of a math class but to help you decide which math class would be best for you.** When you have finished answering the questions, click on the "Submit" button at the bottom of this page.

What is your main reason for enrolling at American River College?

Have you ever completed a semester/quarter at a college or university?

Yes

No

If you answered "yes", what was your grade point average (GPA)?

Now, think about the last math course that you completed with a C or better. Answer the following questions about that course.

Where did you take the course?

When did you take it?

What course was it, or what kind of material did it cover?

Was it an honors or Advanced Placement class?

What grade did you get?

Are you currently taking a math course?

If you answered "yes", where are you taking it?

If you answered "yes", what course is it?

If you answered "yes", what grade are you getting in it right now?

Now you need to think about how busy you will be this semester.

How many hours a week do you expect to spend working at a job(s), internship(s) or other vocational program(s)?

If you play a sport or give performances, how many hours a week do you expect to spend at practices, games, rehearsals or performances?

How many classes (or units) do you expect to enroll in this semester (including schools other than ARC)?

Keeping in mind your job, your family responsibilities, your activities, and the classes you are taking, how many hours per week do you expect to have available for homework (even if you don't always use it all)?

For each statement below, select the answer that best describes you.

I ____ study with other students in my math classes.

I ____ ask questions or respond to questions in my math classes.

I ____ seek help outside of class when I don't understand the material in a math class.

It will be ____ important to attend all meetings of my math class.

It will be ___ important to keep up with homework in my math class.

How much do you agree with these statements about yourself?

I like doing math.

Math makes me nervous.

I enjoy being in school.

I will probably need to use math in the future.

I expect to do well in my math course.

I am good at focusing on difficult tasks.

I think I will be generally a good student.

Appendix B: Self-Placement Elementary Algebra Assessment

Step 5 - Assess Your Math Skills: Are you ready for Elementary Algebra?

The questions below will help you determine whether or not you are ready to take Beginning Algebra. **Students who enroll in Beginning Algebra should already be able to answer these questions.**

Do your best to answer each of the following questions. If you cannot answer them within 15 or 20 minutes, this class may prove very difficult for you and you may want to consider taking "*Pre-Algebra (Math 32)*."

Please answer the following math problem and click on the "Submit" button.

1. $(-12) \div 2 - 2^3 \cdot 4$

A) 8	B) -30	C) -8	D) -38	E) I don't know how to answer this question.
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[Click here to answer question number 1](#)

2. $\left(\frac{1}{4}\right) \div \left(\frac{3}{2}\right) - \frac{1}{3}$

A) $\frac{1}{24}$	B) $\frac{-1}{6}$	C) $\frac{2}{5}$	D) $\frac{-1}{4}$	E) I don't know how to answer this question.
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[Click here to answer question number 2](#)

3. $\frac{x-3}{5} = \frac{2}{3}$

A) $\frac{3}{5}$	B) $\frac{19}{3}$	C) 1	D) $\frac{13}{3}$	E) I don't know how to answer this question.
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[Click here to answer question number 3](#)

4. $13 + 4(2x - 5)$

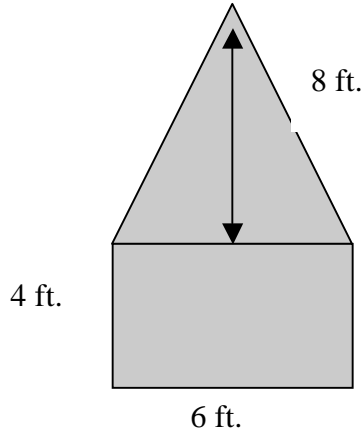
A) $13 - 12x$	B) $34x - 85$	C) $8x + 8$	D) $8x - 7$	E) I don't know how to answer this question.
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[Click here to answer question number 4](#)

The following formulas are for use in answering question 5.

FORMULAS		
$A = l \cdot w$	$A = \frac{1}{2}b \cdot h$	$A = \pi r^2$
		$\pi = 3.14$
$P = 2l + 2w$	$P = a + b + c$	$C = 2\pi r$
		$\pi = 3.14$

5. Find the total area of the enclosed region.



A) 18 sq.ft.	B) 32 sq.ft.	C) 48 sq.ft.	D) 72 sq.ft.	E) I don't know how to answer this question.
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[Click here to answer question number 5](#)

6. The sales tax in Sacramento is 7.75%. Kathy buys a small TV/DVD combo whose price is \$250. What is the sales tax on the TV/DVD combo?

A) \$18.96	B) \$1.94	C) \$32.26	D) \$19.38	E) I don't know how to answer this question.
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[Click here to answer question number 6](#)

**If you have answered all the questions,
click on the "Submit" button.**

Appendix C: Self-Placement Trigonometry Assessment

Step 5 - Assess Your Math Skills: Are you ready to take courses that involve advanced math concepts?

These are transfer-level courses!

Before you can enroll in any of them, you need to be able to present a transcript demonstrating that you have met the course prerequisites.

The questions below will help you determine whether or not you are ready to take any of the following classes:

- ☞ Mathematical Discovery (Math 310)
- ☞ Introduction to Symbolic Logic (Math 320)
- ☞ Introduction to Mathematical Ideas (Math 300)
- ☞ Problem Solving (Math 325)
- ☞ Pre-Calculus (Math 370)
- ☞ Calculus for Business and Economics (Math 340)
- ☞ Modern Business Mathematics (Math 342)
- ☞ Calculus for Life and Social Sciences I (Math 350)
- ☞ Pre-Calculus (Math 370)


Students who enroll in any of the above classes should *already* be able to answer all of the questions below.

Do your best to answer each of the following questions. If they seem to be too difficult for you, or if you cannot answer them within 15 to 20 minutes, you may want to consider taking "*Intermediate Algebra (Math 120)*."

Please answer the following math problems and click on the "Submit" button.


1. A rock is thrown upward from ground level. Its height, h , is given (in feet) by the formula $h = -16t^2 + 160t$, where t is the number of seconds since the rock was thrown. What is the maximum height (in feet) the rock will reach?

A) 5	B) 10	C) 320	D) 400	E) I don't know how to answer this question.
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Click here to select your answer to question 1 


2. Solve the equation $\log_2 x + \log_2 (x + 4) = 5$.

A) 1	B) -5 or 1	C) 4 or -8	D) 4	E) I don't know how to answer this question.
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Click here to select your answer to question 2 


3. If $f(x) = 8x - 5$, what is $f^{-1}(x)$?

A) $\frac{1}{8x-5}$	B) $\frac{x+5}{8}$	C) $8x+5$	D) $5-8x$	E) I don't know how to answer this question.
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Click here to select your answer to question 3 

4. Edwin has eight gallons of a mixture that is 10% antifreeze. He also has a mixture that is 50% antifreeze. How many gallons of the 50% mixture should he add to the 10% mixture, in order to make a mixture that is 25% antifreeze?

A) 4.8	B) 4	C) 1.6	D) 8	E) I don't know how to answer this question.
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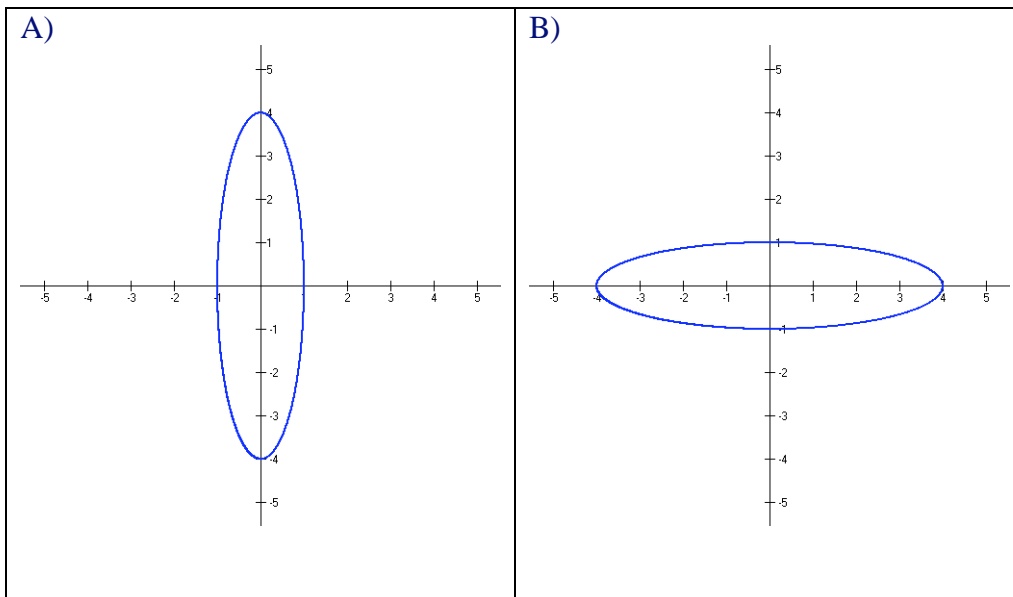
Click here to select your answer to question 4 

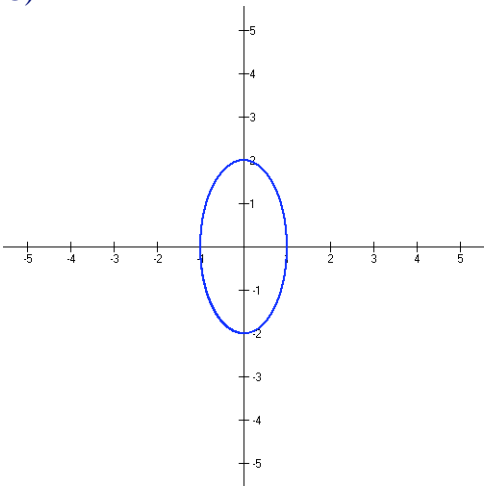
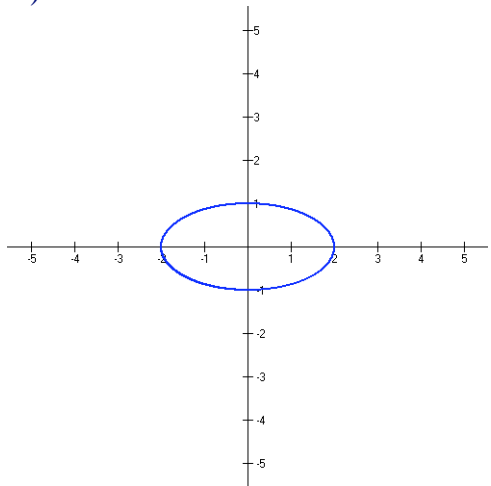
5. Simplify: $\frac{3x^2}{x^2 - 8x + 15} + \frac{x}{x - 5} - \frac{4}{x - 3}$.

A)	B)	C)	D)	E) I don't know how to answer this question.
$\frac{3x^2 + x - 4}{x^2 - 6x + 7}$	$\frac{4x^2 - 7x + 20}{(x - 3)(x - 5)}$	$\frac{4x^2 - 7x - 20}{(x - 3)(x - 5)}$	$\frac{3x + 4}{x - 6}$	

Click here to select your answer to question 5

6. Which is the graph of $\frac{x^2}{1} + \frac{y^2}{4} = 1$?



<p>C)</p> 	<p>D)</p> 	<p>E) I don't know how to answer this question.</p>
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Click here to select your answer to question 6

7. In order to turn $x^2 - 16x$ into a perfect square trinomial, what constant would you have to add?

A) -64	B) 64	C) 8	D) -8	E) I don't know how to answer this question.
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Click here to select your answer to question 7

8. If $g(x) = 2 + \sqrt{x}$ and $h(x) = 3x - 1$, what is $h(g(9))$?

A) $2 + \sqrt{26}$	B) 51	C) 14	D) 130	E) I don't know how to answer this question.
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Click here to select your answer to question 8

**If you have answered all the questions,
click on the "Submit" button.**

Appendix D: Interview Question Matrix

Origins	Researchers	Students	Counselors	Faculty	Administrators
Could you give us a sense of why ARC embarked upon a student self-placement process? What was the impetus for this project? What problems were you trying to address?	Yes			Yes	Yes
By way of context, could you tell us a bit about the need for remedial education at ARC?	Yes			Yes	Yes
What made you decide to switch from the computerized test to online self-placement tests for math?	Yes				Yes
What type of placement exams did ARC use prior to self-placement? How long has self-placement been used at ARC?	Yes				
Description of Self-Placement	Researchers	Students	Counselors	Faculty	Administrators
How would you compare the self-placement exams with 11th grade California Standards Tests in terms of difficulty?		Yes		Yes	
Did you take the self-placement exams at ARC? Before or after enrolling in classes? How did you know about these exams?		Yes			
Was the exam useful to you? If so, in what ways?		Yes			
Did you "pass" self-placement? Do you believe you are well prepared for college classes?		Yes			
Placement Decisions	Researchers	Students	Counselors	Faculty	Administrators
Can you compare how placement decisions were made prior to self-placement with the way they are done now?	Yes		Yes		
Can you describe how you decided what level math and English classes to take?		Yes			
Did you speak to a counselor or advisor about the math and English classes to take? What advice did they give you?		Yes			
In making placement decisions, what other factors did you consider besides score on the placement exam? Is there a "pass score"?		Yes	Yes		
Do students require less of your time, since self-placement puts more of the burden on them?			Yes		
What type of course decisions are students making as a result of self-placement? Has enrollment in remedial courses increased/decreased? How have students performed on self-placement? In regular college classes?	Yes		Yes	Yes	
Do you receive student level information from placement? If so, how do you use it?			Yes	Yes	
What is your approach in helping students make course decisions?			Yes		
Is It Working?	Researchers	Students	Counselors	Faculty	Administrators
How would you compare the effectiveness of self-placement with computerized or pencil and paper tests?	Yes		Yes		Yes
Early results of self-placement show that students are taking lower level math courses than they did under previous placement exams. Does this decrease the likelihood of transfer? How well do self-placement students perform in remedial classes?	Yes				Yes

For courses you took as a result of a self-placement test, were you at the right level?		Yes		Yes	
Based on the first couple of years, what has worked well and what would you do differently?	Yes				Yes
What validity tests have been done on the self-placement tests and what are the results? Why the predicted course grade with results of self-placement test?	Yes			Yes	
For students who take self-placement before meeting with a counselor, does it impact their likelihood of enrolling?					Yes
To what extent has self-placement led students to better prepare themselves for college credit work? What evidence is available to expand upon this issue?			Yes	Yes	
(Remedial Faculty) In what ways has student motivation changed, if at all, based on those who enroll due to self-placement, vs. those who are placed there as a result of institutional policy?			Yes	Yes	
Future of Self-Placement	Researchers	Students	Counselors	Faculty	Administrators
How do you gauge the success or failure of self-placement? Is it something that ARC plans to continue?					Yes
What advice would you give another community college considering the self-placement program?	Yes				Yes

Appendix E: Sample COMPASS Math, Reading, and Writing Questions

COMPASS offers five mathematics placement tests in the following subjects: numerical skills/pre-algebra, algebra, college algebra, geometry, and trigonometry. Two sample questions from the college algebra placement test are shown below.

College Algebra Placement

(Complex Numbers)

1. For $i = \sqrt{-1}$, if $3i(2 + 5i) = x + 6i$, then $x = ?$

- A. -15
- B. 5
- C. $5i$
- D. $15i$
- E. $27i$

(Functions)

2. If $f(4) = 0$ and $f(6) = 6$, which of the following could represent $f(x)$?

- A. $\frac{2}{3}x - 4$
- B. $x + 2$
- C. $x - 4$
- D. $\frac{3}{2}x + 6$
- E. $3x - 12$

COMPASS has reading questions categorized as either “humanities” or “practical reading.” A passage and two sample “humanities” questions appear below.

Sample Humanities Passage: Reading Placement

When I'm in New York but feeling lonely for Wyoming I look for the Western movie ads in the subway. But the men I see in those posters with their stern, humorless looks remind me of no one I know in the West. In our earnestness to romanticize the cowboy we've ironically disesteemed his true character. If he's "strong and silent" it's because there's probably no one to talk to. If he "rides away into the sunset" it's because he's been on horseback since four in the morning moving cattle and he's trying, fifteen hours later, to get home to his family. If he's "a rugged individualist" he's also part of a team: ranch work is teamwork and even the glorified open-range cowboys of the 1880s rode up and down the Chisholm Trail in the company of twenty or thirty other riders. It's not toughness but "toughing it out" that counts. In other words, this macho, cultural artifact the cowboy has become is simply a man who possesses resilience, patience, and an instinct for survival. "Cowboys are just like a pile of rocks—everything happens to them. They get climbed on, kicked, rained and snowed on, scuffed up by the wind. Their job is 'just to take it,'" one old-timer told me.

Adapted from Gretel Ehrlich, *The Solace of Open Spaces*. ©1985 by Gretel Ehrlich.

(Referring)

1. According to the passage, cowboys are probably "strong and silent" because:
 - A. their work leaves them no time for conversation.
 - B. they have been cautioned not to complain.
 - C. they are stern and humorless.
 - D. there is no one nearby to listen to them.
 - E. their work makes them too tired to talk.

(Reasoning)

2. For which of the following statements does the passage give apparently contradictory evidence?
 - A. The cowboy's work takes endurance.
 - B. Cowboys work alone.
 - C. Cowboys are adequately paid.
 - D. The cowboy's image has become romanticized in American culture.
 - E. Cowboys think of themselves as humorless.

The COMPASS writing placement tests students' ability to read a passage and correct errors related to usage/mechanics such as punctuation, grammar, or sentence structure and rhetorical skills such as strategy, organization, and style. A sample passage with four related questions appears below.

Sample Essay: Writing Skills Placement

Examinees are presented with an essay similar to the one below and are asked to look for errors in grammar, punctuation, usage, and style. When examinees find what they believe to be errors, they move the mouse pointer to the appropriate part of the text and click the mouse. On the right side of the screen five options appear for revising that area of text. Note that the first option is always identical to the original wording in the text, and thus represents a NO CHANGE option. Examinees can choose to revise any section of the essay. After revising the essay, examinees are routed to two items focusing on rhetorical strategies.

The essay below contains the same number and types of errors that an actual Writing Skills Test unit would contain; however, for demonstration purposes, only a handful of the segments below have been selected for revision. These segments are indicated by bold type, and the items associated with them are shown below. (Note: There are additional errors in the essay that are not in bold that a student in an actual testing situation would need to respond to.)

An increasing number of lakes and rivers in the northern United States invaded are being by a mussel no larger than a fingernail.

The zebra mussel probably steamed aboard a transatlantic ship sometime in the mid-1980s from the Caspian Sea into U.S. waters. Despite its growth was explosive, partly because the species **was preyed upon by very few native predators in its new environment**. As a consequence, the zebra mussels did find a plentiful food supply. They eat huge amounts of phytoplankton, which tiny free-floating sea organisms that dwell in water. **Scientists are concerned when the mussels** may compete aggressively with other species that depend on the same food supply.

Others concerned by the invading species are industry, public utilities, and boat owners. Zebra mussels cluster in huge colonies, being anchored themselves to any hard surface. These colonies can clog your water intake pipes of electric and water treatment plants. Fishery specialists are currently casting about and baiting their hooks to gun down control methods that will cause the lowest amount of damage to water supplies and other aquatic species. Two of the alternatives exploring are interrupting the species reproductive cycle and finding a bacterium harmful only to zebra mussels.

(End of Essay)

(Basic Grammar and Usage: Ensuring Grammatical Agreement)

Segment 1

- A. An increasing number of lakes and rivers
- B. An increasingly number of lakes and rivers
- C. A number increasing of lakes and rivers
- D. A number increasingly of lakes and rivers
- E. An increasing of lakes and rivers

(Style: Avoiding Redundancy)

Segment 2

- A. was preyed upon by very few native predators in its new environment.
- B. found very few predators in its new environment.
- C. found very few native predators and was seldom eaten in its new environment.
- D. was preyed on by very few native predator species in its new environment.
- E. was seldom eaten or preyed on by native predator species in its new environment.

(Sentence Structure: Relating Clauses)

Segment 3

- A. Scientists are concerned when the mussels
- B. Scientists are concerned that if the mussels
- C. Scientists are concerned wherein the mussels
- D. Scientists are concerned that the mussels
- E. Scientists are concerned as if the mussels

(Strategy: Making Decisions about Cohesive Devices)

Item 4 (end-of-passage)

The writer wishes to add a sentence at the end of Paragraph 1 that will serve as a transition between Paragraphs 1 and 2 and will establish the main focus of the essay. Which of the following sentences most effectively fulfills that purpose?

- A. The zebra mussel will provide a difficult challenge for public utility managers.
- B. The zebra mussel is only the latest in a series of newly introduced species to thrive in the U.S.

- C.** No one knows how far south and west the zebra mussel is likely to spread, but scientists think they may be on the trail of important clues.
- D.** Although small in size, the zebra mussel may become a huge problem for pleasure boat owners in North American waterways.
- E.** Despite its size, however, the zebra mussel may have a dramatic effect on North American waterways.

About the Authors

JONATHAN E. FELDER is a policy analyst at the National Center for Public Policy and Higher Education. His background includes work in policy analysis, research, and data analysis. As a policy analyst at the National Center, Felder's work focuses primarily on data collection and policy analysis. Prior to this, Felder worked in the education division at Save the Children. His other work includes an analysis of STAR test results in San Mateo County primary schools. He holds a master's in Social Sciences of Education from Stanford University and a bachelor's degree from Cornell University.

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MICHAEL W. KIRST is professor of education at Stanford University and former president of the California State Board of Education. He is a faculty affiliate with the Department of Political Science, and has a courtesy appointment with the Graduate School of Business. Before joining the Stanford University faculty, Kirst held several positions with the federal government, including staff director of the U.S. Senate Subcommittee on Manpower, Employment, and Poverty, and director of program planning and evaluation for the Bureau of Elementary and Secondary Education in the former U.S. Office of Education. He was the principal investigator for Stanford University's Bridge Project and is co-author of *Betraying the College Dream* and *From High School to College*.

Acknowledgements

The authors are pleased to acknowledge financial support for this research from the Education Program at The William and Flora Hewlett Foundation. We also thank Peter Ewell, vice president of the National Center for Higher Education Management Systems, for his keen insights as a member of our technical and national review panels. Michael Usdan, senior fellow at the Institute for Educational Leadership, chaired our national review panel which provided helpful ideas and feedback.

Jim Barr of the American River College Research Office was instrumental in providing information and explaining self-placement. Cathie Browning, also from the American River College Research Office, helped coordinate our campus interviews and served as an information resource on self-placement. We would also like to thank all of the faculty, administrators, counselors, students, and staff whom we interviewed at American River College. Their reactions and opinions were critical to the study.

We would also like to acknowledge others who provided comments and suggestions during the course of our work: Richard Brown, Rossier School of Education, University of Southern California; Steve Bruckman, California Community Colleges System Office; Andrea Conklin Bueschel, The Carnegie Foundation for the Advancement of Teaching; Pamela Burdman, The William and Flora Hewlett Foundation; Marlene Garcia, California Senate Office of Research; Robert McCabe, League for Innovation in the Community College; Brad Phillips, Cal-PASS; Nancy Shapiro, University System of Maryland; Nancy Shulock, Institute for Higher Education Leadership and Policy, California State University, Sacramento; Abdi Soltani, Campaign for College Opportunity.

Our thanks to Mae Kaven from The Last Detail for providing editorial assistance.

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“Informed Self-Placement” at American River College: A Case Study, by Jonathan E. Felder, Joni E. Finney, and Michael W. Kirst (May 2007, #07-2) This case study of American River College in Sacramento, California, examines replacing the traditional mathematics class placement test with “informed self-placement.”

California Community Colleges: Making Them Strong and More Affordable, by William Zumeta and Deborah Frankle (March 2007, #07-1). This report examines the effectiveness of statewide policies in assisting the California Community Colleges in meeting their mandate for affordability, and makes recommendations in light of today's public needs.

Measuring Up Internationally: Developing Skills and Knowledge for the Global Knowledge Economy, by Alan Wagner (September 2006, #06-7). In comparing the performance of the United States in higher

education with that of advanced, market-economy countries across the globe, this report finds that the United States' leadership position has eroded.

Measuring Up 2006: The National Report Card on Higher Education (September 2006). *Measuring Up 2006* consists of a national report card for higher education (report #06-5) and 50 state report cards (#06-4). The purpose of *Measuring Up 2006* is to provide the public and policymakers with information to assess and improve postsecondary education in each state. For the first time, this edition offers international comparisons with states and the nation as a whole. Visit www.highereducation.org to download *Measuring Up 2006* or to make your own comparisons of state performance in higher education.

Technical Guide for Measuring Up 2006: Documenting Methodology, Indicators, and Data Sources (2006, #06-6).

Checks and Balances at Work: The Restructuring of Virginia's Public Higher Education System, by Lara K. Couturier (June 2006, #06-3). This case study of Virginia's 2005 Restructured Higher Education Financial and Administrative Operations Act examines the restructured relationship between the commonwealth and its public colleges and universities. The act gives more autonomy to the public colleges but checks it with new accountability targeted directly to the needs of the state.

American Higher Education: How Does It Measure Up for the 21st Century? by James B. Hunt Jr. and Thomas J. Tierney with a foreword by Garrey Carruthers (May 2006, #06-2). These essays by former Governor James B. Hunt Jr. and business leader Thomas J. Tierney lay out in succinct fashion the requirements of both our nation and our states for new and higher levels of performance from America's colleges and universities.

Claiming Common Ground: State Policymaking for Improving College Readiness and Success, by Patrick M. Callan, Joni E. Finney, Michael W. Kirst, Michael D. Usdan, and Andrea Venezia (March 2006, #06-1). To improve college readiness and success, states can develop policies that better connect their K–12 and postsecondary education systems. However, state action in each of the following policy areas is needed to create college-readiness reform: alignment of coursework and assessments; state finance; statewide data systems; and accountability.

Measuring Up on College-Level Learning, by Margaret A. Miller and Peter T. Ewell (October 2005, #05-8). In this report, the National Forum on College-Level Learning proposes a model for evaluating and comparing college-level learning on a state-by-state basis, including assessing educational capital. As well as releasing the results for five participating states, the authors also explore the implications of their findings in terms of performance gaps by race/ethnicity and educating future teachers.

The Governance Divide: A Report on a Four-State Study on Improving College Readiness and Success, by Andrea Venezia, Patrick M. Callan, Joni E. Finney, Michael W. Kirst, and Michael D. Usdan (September 2005, #05-3). This report, supported by case studies in Florida, Georgia, New York, and Oregon, identifies and examines policy options available to states that are interested in creating sustained K–16 reform.

The Governance Divide: The Case Study for Florida, by Andrea Venezia and Joni E. Finney (2006, #05-4).

The Governance Divide: The Case Study for Georgia, by Andrea Venezia, Patrick M. Callan, Michael W. Kirst, and Michael D. Usdan (2006, #05-5).

The Governance Divide: The Case Study for New York, by Andrea Venezia, Michael W. Kirst, and Michael D. Usdan (2006, #05-6).

The Governance Divide: The Case Study for Oregon, by Andrea Venezia and Michael W. Kirst (2006, #05-7).

Borrowers Who Drop Out: A Neglected Aspect of the College Student Loan Trend, by Lawrence Gladieux and Laura Perna (May 2005, #05-2). This report examines the experiences of students who borrow to finance their educations, but do not complete their postsecondary programs. Using the latest comprehensive data, this report compares borrowers who drop out with other groups of students, and provides recommendations on policies and programs that would better prepare, support, and guide students—especially low-income students—in completing their degrees.

Case Study of Utah Higher Education, by Kathy Reeves Bracco and Mario Martinez (April 2005, #05-1). This report examines state policies and performance in the areas of enrollment and affordability. Compared with other states, Utah has been able to maintain a system of higher education that is more affordable for students, while enrollments have almost doubled over the past 20 years.

Measuring Up 2004: The National Report Card on Higher Education (September 2004). *Measuring Up 2004* consists of a national report card for higher education (report #04-5) and 50 state report cards (#04-4). The purpose of *Measuring Up 2004* is to provide the public and policymakers with information to assess and improve postsecondary education in each state. For the first time, this edition provides information about each state's improvement over the past decade. Visit www.highereducation.org to download *Measuring Up 2004* or to make your own comparisons of state performance in higher education.

Technical Guide Documenting Methodology, Indicators, and Data Sources for Measuring Up 2004 (November 2004, #04-6).

Ensuring Access with Quality to California's Community Colleges, by Gerald C. Hayward, Dennis P. Jones, Aims C. McGuinness, Jr., and Allene Timar, with a postscript by Nancy Shulock (May 2004, #04-3). This report finds that enrollment growth pressures, fee increases, and recent budget cuts in the California Community Colleges are having significant detrimental effects on student access and program quality. The report also provides recommendations for creating improvements that build from the state policy context and from existing promising practices within the community colleges.

Public Attitudes on Higher Education: A Trend Analysis, 1993 to 2003, by John Immerwahr (February 2004, #04-2). This public opinion survey, prepared by Public Agenda for the National Center, reveals that public attitudes about the importance of higher education have remained stable during the recent economic downturn. The survey also finds that there are some growing public concerns about the costs of higher education, especially for those groups most affected, including parents of high school students, African-Americans, and Hispanics.

Responding to the Crisis in College Opportunity (January 2004, #04-1). This policy statement, developed by education policy experts at Lansdowne, Virginia, proposes short-term emergency measures and long-term priorities for governors and legislators to consider for funding higher education during the current lean budget years. *Responding to the Crisis* suggests that in 2004 the highest priority for state higher education budgets should be to protect college access and affordability for students and families.

With Diploma in Hand: Hispanic High School Seniors Talk About Their Future, by John Immerwahr (June 2003, #03-2). This report by Public Agenda explores some of the primary obstacles that many

Hispanic students face in seeking higher education—barriers that suggest opportunities for creative public policy to improve college attendance and completion rates among Hispanics.

Purposes, Policies, Performance: Higher Education and the Fulfillment of a State’s Public Agenda (February 2003, #03-1). This essay is drawn from discussions of higher education leaders and policy officials at a roundtable convened in June 2002 at New Jersey City University on the relationship between public purposes, policies, and performance of American higher education.

Measuring Up 2002: The State-by-State Report Card for Higher Education (October 2002, #02-7). This report card, which updates the inaugural edition released in 2000, grades each state on its performance in five key areas of higher education. *Measuring Up 2002* also evaluates each state’s progress in relation to its own results from 2000.

Technical Guide Documenting Methodology, Indicators, and Data Sources for Measuring Up 2002 (October 2002, #02-8).

State Policy and Community College–Baccalaureate Transfer, by Jane V. Wellman (July 2002, #02-6). This report recommends state policies to energize and improve higher education performance regarding transfers from community colleges to four-year institutions.

Fund for the Improvement of Postsecondary Education: The Early Years (June 2002, #02-5). The Fund for the Improvement of Postsecondary Education (FIPSE) attained remarkable success in funding innovative and enduring projects during its early years. This report, prepared by FIPSE’s early program officers, describes how those results were achieved.

Losing Ground: A National Status Report on the Affordability of American Higher Education (May 2002, #02-3). This national status report documents the declining affordability of higher education for American families, and highlights public policies that support affordable higher education. It provides state-by-state summaries as well as national findings.

The Affordability of Higher Education: A Review of Recent Survey Research, by John Immerwahr (May 2002, #02-4). This review of recent surveys by Public Agenda confirms that Americans feel that rising college costs threaten to make higher education inaccessible for many people.

Coping with Recession: Public Policy, Economic Downturns, and Higher Education, by Patrick M. Callan (February 2002, #02-2). This report outlines the major policy considerations that states and institutions of higher education face during economic downturns.

Competition and Collaboration in California Higher Education, by Kathy Reeves Bracco and Patrick M. Callan (January 2002, #02-1). This report argues that the structure of California’s state higher education system limits the system’s capacity for collaboration.

Measuring Up 2000: The State-by-State Report Card for Higher Education (November 2000, #00-3). This first-of-its-kind report card grades each state on its performance in higher education. The report card also provides comprehensive profiles of each state and brief states-at-a-glance comparisons.

Beneath the Surface: A Statistical Analysis of the Major Variables Associated with State Grades in Measuring Up 2000, by Alisa F. Cunningham and Jane V. Wellman (November 2001, #01-4). Using statistical analysis, this report explores the “drivers” that predict overall performance in *Measuring Up 2000*.

Supplementary Analysis for Measuring Up 2000: An Exploratory Report, by Mario Martinez (November 2001, #01-3). This supplement explores the relationships within and among the performance categories in *Measuring Up 2000*.

Some Next Steps for States: A Follow-up to Measuring Up 2000, by Dennis Jones and Karen Paulson (June 2001, #01-2). This report suggests a range of actions that states can take to bridge the gap between state performance identified in *Measuring Up 2000* and the formulation of effective policy to improve performance in higher education.

A Review of Tests Performed on the Data in Measuring Up 2000, by Peter Ewell (June 2001, #01-1). This review describes the statistical testing performed on the data in *Measuring Up 2000* by the National Center for Higher Education Management Systems.

Recent State Policy Initiatives in Education: A Supplement to Measuring Up 2000, by Aims C. McGuinness, Jr. (December 2000, #00-6). This supplement highlights education initiatives that states have adopted since 1997–98.

Assessing Student Learning Outcomes: A Supplement to Measuring Up 2000, by Peter Ewell and Paula Ries (December 2000, #00-5). This report is a national survey of state efforts to assess student learning outcomes in higher education.

Technical Guide Documenting Methodology, Indicators and Data Sources for Measuring Up 2000 (November 2000, #00-4).

A State-by-State Report Card on Higher Education: Prospectus (March 2000, #00-1). This document summarizes the goals of the National Center's report-card project.

Great Expectations: How the Public and Parents—White, African-American, and Hispanic—View Higher Education, by John Immerwahr with Tony Foleno (May 2000, #00-2). This report by Public Agenda finds that Americans overwhelmingly see higher education as essential for success. Survey results are also available for the following states:

Great Expectations: How Pennsylvanians View Higher Education (May 2000, #00-2b).

Great Expectations: How Floridians View Higher Education (August 2000, #00-2c).

Great Expectations: How Coloradans View Higher Education (August 2000, #00-2d).

Great Expectations: How Californians View Higher Education (August 2000, #00-2e).

Great Expectations: How New Yorkers View Higher Education (October 2000, #00-2f).

Great Expectations: How Illinois Residents View Higher Education (October 2000, #00-2h).

State Spending for Higher Education in the Next Decade: The Battle to Sustain Current Support, by Harold A. Hovey (July 1999, #99-3). This fiscal forecast of state and local spending patterns finds that the vast majority of states will face significant fiscal deficits over the next eight years, which will in turn lead to increased scrutiny of higher education in almost all states, and to curtailed spending for public higher education in many states.

South Dakota: Developing Policy-Driven Change in Higher Education, by Mario Martinez (June 1999, #99-2). This report describes the processes for change in higher education that government, business, and higher education leaders are creating and implementing in South Dakota.

Taking Responsibility: Leaders' Expectations of Higher Education, by John Immerwahr (January 1999, #99-1). This paper reports the views of those most involved with decisionmaking about higher education, based on focus groups and a survey conducted by Public Agenda.

The Challenges and Opportunities Facing Higher Education: An Agenda for Policy Research, by Dennis Jones, Peter Ewell, and Aims McGuinness, Jr. (December 1998, #98-8). This report argues that due to substantial changes in the landscape of postsecondary education, new state-level policy frameworks must be developed and implemented.

Higher Education Governance: Balancing Institutional and Market Influences, by Richard C. Richardson, Jr., Kathy Reeves Bracco, Patrick M. Callan, and Joni E. Finney (November 1998, #98-7). This publication describes the structural relationships that affect institutional effectiveness in higher education, and argues that state policy should strive for a balance between institutional and market forces.

Federal Tuition Tax Credits and State Higher Education Policy: A Guide for State Policy Makers, by Kristin D. Conklin (December 1998, #98-6). This report examines the implications of the federal income tax provisions for students and their families, and makes recommendations for state higher education policy.

The Challenges Facing California Higher Education: A Memorandum to the Next Governor of California, by David W. Breneman (September 1998, #98-5). This memorandum argues that California should develop a new Master Plan for Higher Education.

Tidal Wave II Revisited: A Review of Earlier Enrollment Projections for California Higher Education, by Gerald C. Hayward, David W. Breneman, and Leobardo F. Estrada (September 1998, #98-4). This review finds that earlier forecasts of a surge in higher education enrollments were accurate.

Organizing for Learning: The View from the Governor's Office, by James B. Hunt Jr., chair of the National Center for Public Policy and Higher Education, and former governor of North Carolina (June 1998, #98-3). This publication is an address to the American Association for Higher Education concerning opportunity in higher education.

The Price of Admission: The Growing Importance of Higher Education, by John Immerwahr (Spring 1998, #98-2). This report is a national survey of Americans' views on higher education, conducted and reported by Public Agenda.

Concept Paper: A National Center to Address Higher Education Policy, by Patrick M. Callan (March 1998, #98-1). This concept paper describes the purposes of the National Center for Public Policy and Higher Education.

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