Advanced Yes, Placement No

This month, College Board officials released the latest data on the Advanced Placement program, noting record increases in the numbers of students taking AP courses and scoring well enough on the exams to get college credit. The AP program saves students “time and tuition,” said Gaston Caperton, president of the College Board. The Bush administration is climbing on the AP bandwagon as well, calling for more students to take the courses in high school.

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There’s just one problem, according to research presented Friday in St. Louis at the annual meeting of the American Association for the Advancement of Science: AP courses — whatever their merits — may be poor substitutes for college courses in the sciences.

The study looked at 18,000 students in introductory biology, chemistry and physics courses in college. The students were at 63 randomly selected four-year colleges and universities and their performance in the courses was correlated to various factors. The researchers found that students who had taken AP courses — even those who had done well on the AP exams — did only marginally better than students who had not taken AP courses. Other factors, such as the rigor of mathematics taken in high school, were found to have a strong impact on whether students did well in college-level work in the sciences.

“Our survey, the largest ever of its type, suggests that AP courses do not contribute substantially to student success in college,” said Philip M. Sadler, director of science education at the Harvard University-Smithsonian Center for Astrophysics and a senior lecturer in astronomy at Harvard. “Even a score of 5 on an AP test is no guarantee of a college grade of A in the same subject,” he said.

Sadler conducted the study — which is being disputed by the College Board — with Robert H. Tai, assistant professor of science education at the University of Virginia.

They found that students who received a 5 on an AP exam in science and then took the same material in college averaged only 90 — even after the additional year of college study in an area in which they had presumably already demonstrated A-level work. Students who received an AP score of 4 averaged 87
and those who received an AP score of 3 received an average grade after a full year of college science of only 84 — compared to 82 as the average for students who had taken honors science courses in high school, but who had not taken AP science classes. Sadler said that if the AP system lived up to its billing (in which scores of 3 are recognized by many colleges as indicating successful completion of college-level work), the students with AP scores of 3-5 should have done much better in college.

Other factors, having nothing to do with AP, did have a strong impact on success in college science: completing strong math courses and high school science courses that were not “drained of math,” a high school curriculum that stressed “depth over breadth,” and laboratory experience in high school in which the outcome of experiments is not known in advance and students must write up their results.

Of course, some of those qualities may well be present in AP courses, and Sadler stressed in an interview that he did not want his findings to be viewed as “anti-AP.” His son is taking AP courses now, and Sadler is pleased that he’s doing so. He’s just dubious that his son should skip any college courses on the basis of AP — and that gets to the central strengths and weaknesses with the program, he said.

“AP courses are very helpful to students, and they give a lot of students some heavy duty things to do in high school and they learn a lot,” Sadler said. For many high schools, he said, AP courses have become a highly effective way of engaging talented students in their senior year — something that has been a struggle for many high schools.

But while AP may function well as enriched content, it doesn’t equal college-level work, Sadler said, and shouldn’t be promoted as such. If the College Board wants to promote the AP curriculum as a way to allow students to receive credit for some college courses, Sadler saw two options: Make the tests significantly more difficult, or create new scores of 6 or 7, above the current top score, and let only the absolutely top performers with such scores earn college credit. Either way, he said, his research suggests that the vast majority of those now achieving scores indicating that they have done college-level work shouldn’t be receiving such scores.

Jennifer Topiel, executive director of public affairs for the College Board, questioned the size of the study, noting that the 18,000 students included many who had never taken an AP course and that many of those who had didn’t receive high scores. She said that College Board data paint a different picture, in which students who score well on AP exams do well not only in introductory courses, but for those who place out of intro courses, in the more advanced classes. “There’s a lot of research that shows the exact opposite of what they are saying,” Topiel said.

Topiel added that the College Board works to keep AP test questions at the right level by giving sample questions to college students in introductory courses, and studying which questions A students, B students and so forth get correct. She also noted that the test questions are developed by college professors.

Sadler said, however, defended his study. He said that if students with 4’s and 5’s on the AP exam were not acing introductory courses, there was no reason to think they would be doing better in more advanced courses.

While his research challenges some conventional wisdom about AP courses, Sadler said that he has been struck by who has not been surprised at all by the results: professors who teach science. “They’ve known this for a long time,” Sadler says, and if they had their way, they wouldn’t award credit for AP (or would do so much more minimally). “They just haven’t had the data.”

— Scott Jaschik

Comments
What would be really interesting would be a study of what AP scorers think. I suspect few who read and score AP US history essays believe 3s are worth anything. Whether that is true of other disciplines as well would be worth examining. ETS is hardly likely to do it.

**Old Main 33**, at 8:55 am EST on February 20, 2006

**Advanced Yes, Placement No**

I totally agree with your article. My son took AP chemistry and struggled with 1st level chemistry his 1st year in college. The second year, organic chemistry was torture. He is still having to work very hard and struggle with his other science classes. Students should take all the enriched and advanced classes they can but they are not a replacement or a guarantee of success for the college level class.

**Lori Eckert**, at 10:15 am EST on February 20, 2006

Schools feel pressure to graduate students and few can afford to lose another marketing strategy by saying they won’t accept certain CLEP credits - but it is an option. The Science Departments can always decide that CLEP is not allowed for particular majors even while their university accepts it in general. For many students, and specifically foreign students, who shriek at having to take all those non-major courses in order to meet their general education requirements the CLEP exams can be a huge money and time saver.

**The Saint**, Academic Advisor at Florida, at 11:10 am EST on February 20, 2006

**AP Study**

The reported results of this study remind me of the results of a student survey a Penn colleague and I conducted in the 1970s. We were each teaching one large section of the calculus-based introductory physics course, perhaps 300 students in all. Our question then was whether the kind of physics a student had taken in high school had any detectable effect on the student’s performance in our course. Over the previous decade or so a group of leading physicists had developed a modernized high school physics course (called PSSC physics) intended to replace traditional courses dating back to the pre-war period. What we found in our admittedly amateur survey of our relatively small sample was that there appeared to be no detectable correlation of students’ performance in our course with whether the students had taken PSSC physics, traditional physics, or any physics at all in high school. We found a very strong correlation, however, with the level of mathematics taken in high school.

**Donald N. Langenberg**, Professor of Physics at University of Maryland, College Park, at 11:45 am EST on February 20, 2006

**Not sure I agree with the conclusions**

While the averages of those getting AP 4 and 5 scores are a bit disappointing the AP score of 3 does translate into a B.

Note that the authors compare the AP 3 scoring students to those who took an honors course in HS instead of to those who took a regular course or nothing.

What would be interesting would be to arrange to give AP exams at the conclusion of the corresponding college course.

**Rob Rittenhouse**, Assoc. Prof at McMurry University, at 12:30 pm EST on February 20, 2006
Bad study

If the people from science are really reading this, then they should understand that the control group is flawed. Basically the study says that transferring courses from alternative curriculums is a handicap. And it is. But that has nothing to do with the rigor of the AP classes.

As an engineering student at Virginia Tech who has both exempted classes from AP exams and transferred courses from Clemson University, I can testify that bringing material from outside your institution is hard. This is equally so for the summer classes from Clemson and the AP classes. Although the general curriculum may be the same, the techniques, notation, styles, focus, and boundaries may all change.

And that is why AP students are tripping up. Not because they can’t handle the workload, but because the work load in the same class is so foreign from what they’ve seen before. If you want a fair comparison, don’t compare AP students to honor students, compare AP students to students who transfer course from other universities.

Matthew Yancey, No control group at Virginia Tech, at 1:40 pm EST on February 20, 2006

Profitability and testing

I suspect (and this is an uninformed speculation, let me confess), that AP scoring may have some of the same source problems as grade inflation more generally.

The College Board is a non-profit, but it doesn’t mean they aren’t selling a product. I suspect that were the tests difficult enough to actually measure college level material, then the testing program would be much less popular, and fewer students would enroll for the test. By making “good” or “acceptable” scores broadly attainable, they attract more paying testtakers, reify the value of their own system, and keep themselves relevant (even perceptually crucial) to the U.S. Academic apparatus.

I know little about IB (International Baccalaureate), so I wonder if others could tell us how that less-popular system compares?

RC, at 1:40 pm EST on February 20, 2006

ap calc != college calc

I’m another college prof who’s getting VERY gun shy on AP. A significant number of my freshman who come in with AP Calculus under their belt are not placing into the next step, and some are being placed as far back as College Algebra. I think a good part of the problem is that Calc is not necessarily taught to mesh with their science courses and is therefore presented without as much context as it could at college where we use it with gusto.

I’d much rather have my incoming freshmen have a solid background in pre-Calc foundations (Trig and Advanced Algebra) form high school and let our Math department give them the college-level classes so this critical coursework in which everything else in their plan-of-study hinges (we’re talking serious bottleneck material here) is timed to be at hand just as they need it (and where it won’t be forgotten).

A Frustrated College Advisor, at 2:15 pm EST on February 20, 2006

I scored English APs. I always tell students that if taking English AP will place them out of freshman comp, don’t take it. It doesn’t even begin to measure what is covered in a good freshman comp course. It covers, as a colleague said, what kind of draft you can write in the time it takes to go down an
Why are we pushing everything back all the time? Now kindergardeners who can’t read are pushed into remedial classes and something is wrong with high school students who can’t do college work. Maybe if they did the work they are supposed to do in high school, more would come adequately prepared to do the work in college.

**Judith, English APs, at 2:45 pm EST on February 20, 2006**

**my AP experience**

I graduated high school in 1965. Took AP Chemistry but the college I was going to go to (Chicago) did not accept AP credit so I did not pay the fee to take the test. I did ask the admissions office why they did not recognize the test and was told, in no uncertain terms, that if I did not think that they could do a better job teaching me Chemistry than some teacher in my high school then I should not bother paying them tuition. They were right. [I suspect that Chicago now does give some credit for AP’s, but am not sure.

**Mark Weinstein, U.S.C., at 3:20 pm EST on February 20, 2006**

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