

Institutional Analysis, Assessment & Reporting

What Happens to Concurrently Enrolled High School Students Who Attended Boise State University During High School? September 2008

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Abstract

This study of concurrent enrollees who took their classes through Boise State University found that:

- A greater percentage of Boise State concurrent enrollees attended college than did Idaho high school graduates as a whole (72.8% vs. 47.4%).*
- Concurrent enrollees who attended Boise State University as undergraduates were younger and had higher high school GPAs than other new full-time freshmen.*
- Concurrent enrollees who took at least one course on the Boise State campus were more likely to attend Boise State University following their high school graduation than were students who took all of their credits on-line or on the high school campus.*
- Concurrent enrollees generally had higher first semester GPAs than did other freshmen. These differences disappeared, however, when the effects of age and high school GPAs were accounted for.*
- Concurrent enrollees were more likely to be retained and to graduate in four years than were other freshmen, even after accounting for differences in age and high school GPA. In addition, students who completed more concurrent credits in high school were also more likely to graduate from college.*
- The relationship of concurrent enrollment to graduation after six years differed for minority and non-minority students. For non-minority students, graduation rates of concurrent enrollees and non-concurrent enrollees were similar after accounting for the effects of age and high school GPA. Minority students who had concurrent enrollment credits had a high probability of graduating in six years compared to their non-concurrent peers, even after accounting for the effects of age and high school GPA.*
- Ultimately, it is difficult to separate the effects of the concurrent enrollment experience from the characteristics of the students who chose the experience. The same personal and environmental factors that lead some high school students to concurrently enroll in college courses probably also continue to play a role during college. We cannot conclude, therefore, that concurrent enrollment alone leads to greater college success. We can, however, say that concurrent enrollment is a reliable indicator that such students are likely to attend college, perform well while there, and graduate.*

This study is based on students who took Boise State University “concurrent enrollment credits,” that is college credits taken while still in high school. Students could elect to take courses on-line, at their high school locations, or on the Boise State campus. The study includes 3,543 students who began taking concurrent enrollment classes in the summer of 1999 through spring of 2008. Most (79.1%) were enrolled as students who apparently were planning to seek an academic degree, but 741 or 20.9% were enrolled in technical programs. Taken all together, these students earned a total of 19,028 credits through concurrent enrollment through the end of spring 2008.

The study addresses the following questions:

- At what rate do BSU concurrently enrolled students go to college? How does that rate compare to that of all recent high school graduates?
- Are concurrent enrollees who attend Boise State University following high school graduation demographically similar to other first-time-in-college students at Boise State?
- Is there a relationship between taking concurrent enrollment classes on the Boise State campus (rather than on-line or at the high school site) and enrollment at Boise State following graduation?
- What is the first term grade point average (GPA) of former concurrent enrollees who attend Boise State? How does that GPA compare to other first-time-in-college students?
- For students who continue at Boise State University following high school graduation, what is their retention rate from fall-to-fall? How do these retention rates compare to those of other first-time-in-college students?
- Does concurrent enrollment correlate with the probability of college graduation?
- For concurrent enrollees, does the number of concurrent credits completed during high school correlate with the probability of graduating from college?

At what rate do concurrently enrolled students go on to college?

According to the latest information available from the *Digest of Education Statistics*¹, about 47.4% of Idaho high school students who graduated in 2003-2004 enrolled in higher education in the fall of 2004 with about 35.0% going to college in Idaho. Though data are unavailable on the college-enrollment rate for concurrent enrollees state-wide, for all BSU concurrent enrollees who graduated from high school in 2003-2004², the figures are 72.8% enrolled in any institution of higher education and 47.2% enrolled in college in Idaho (see Figure 1). Figure 2 shows that the largest percentage of BSU concurrent enrollees chose to attend Boise State University.

The *Digest of Education Statistics* reports on college-going behavior immediately following high school graduation. Many high school graduates, however, wait before enrolling in higher education, so the figures from the *Digest of Education Statistics* underestimate the percentage who ultimately will attend college. In the case of BSU's former concurrent enrollees, the percentage of 2003-2004 high school graduates attending college increased from 72.8% in fall of 2004 to 82.6% by the spring of 2008.

As shown in Figure 1, concurrent enrollment in high school serves as an excellent indicator that the student is likely to go to college. Though it is not possible to say exactly why this is so, potential causes include that (i) concurrent enrollees may tend to be better students seeking greater academic challenges, (ii) they may be more serious about their college goals and hope to get a head-start on completing a college degree, (iii) they may have families who support them in their academic endeavors, (iv) high school teachers and counselors may be more likely to talk to them about college, and/or (v) exposure to the college environment in some way may help them resolve to attend college when they graduate from high school.

¹ Data found at http://nces.ed.gov/programs/digest/d07/tables/dt07_194.asp

² In order to provide the best comparison to all high school graduates, both academic and technical enrollees are included

Figure 1. College-going rates of All 2003-4 Idaho High School Graduates Compared to BSU Concurrent Enrollee Graduates

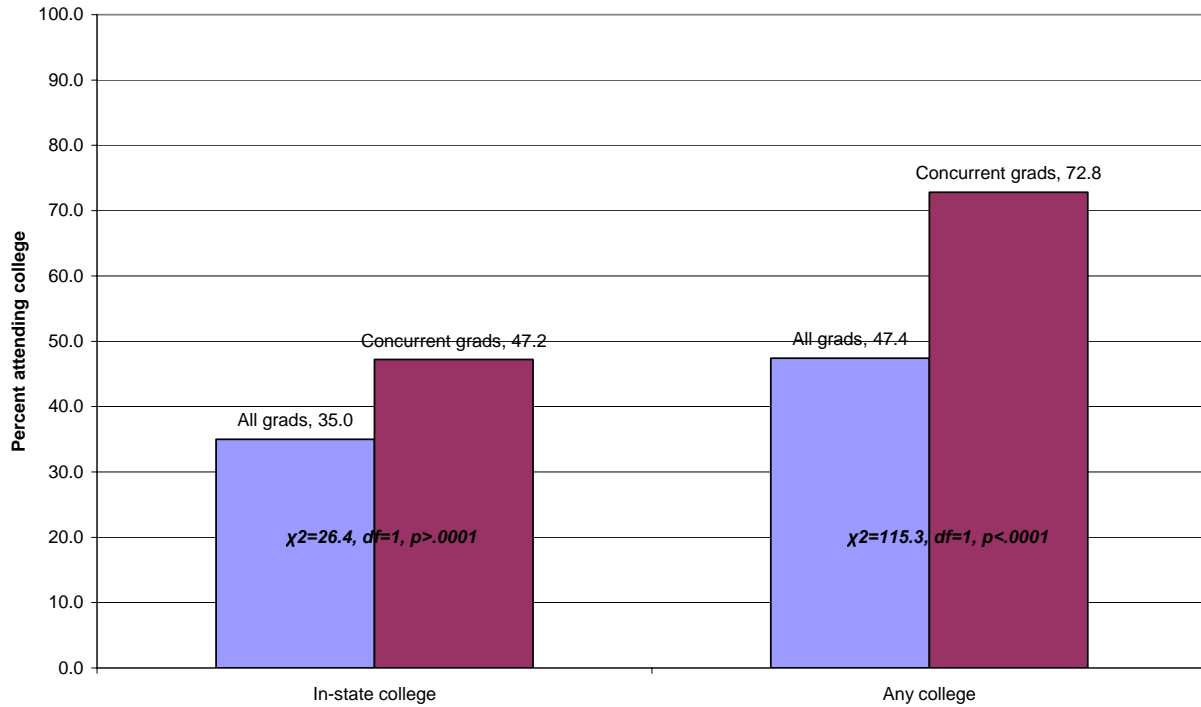
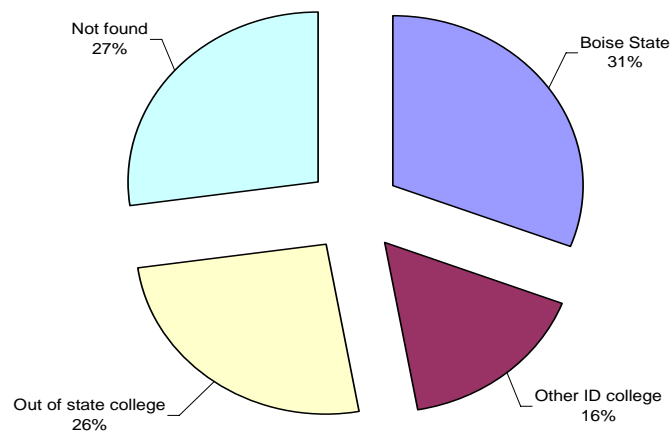


Figure 2. Percentage of 2003-4 Boise State Concurrent Enrollee Graduates Who Enrolled in College in Fall 2004 by Location



Are former concurrent enrollees who attend Boise State University demographically similar to other first-time-in-college students?

As shown by Table 1 below, about 5% (503 of 9,394) of all first-time full-time students were previously concurrently enrolled through Boise State University. Although the two groups were similar based on sex and ethnicity, former concurrent enrollees tended to be younger than other new freshmen and have better grades in high school. These trends may have importance because both age and high school GPA are related to college retention and college GPA.

Table 1. Demographics of fall 2000 through fall 2006 first-time full-time academic-degree seeking students based on concurrent status

Variable:	Former concurrent enrollee (N=503)	Not concurrent enrollee (N=9,394)	Statistical results
Percent male	43.3%	44.7%	$\chi^2=0.39$, df=1, p=.53
Percent minority	10.8%	12.9%	$\chi^2=1.89$, df=1, p=.17
Average Age	18.4	18.9	t=4.92, df=9923, p<.0001
Average High School GPA	3.47	3.31	t=9.10, df=9923, p<.0001

Are concurrently enrolled students who take at least one class on the Boise State University campus during high school (rather than on-line or at the high school site) more likely to attend Boise State?

Of the 2,793 BSU concurrent enrollees in the academic track between summer of 1999 and spring of 2008³, 539 (or 19%) took at least one class on the BSU campus either in Boise or Canyon County. The remaining students took all of their classes either at their high school site or on-line. As shown by Figure 3 below, a greater percentage of students who took courses on campus attended Boise State after high school graduation than students who took only on-line and high school site courses: 48.6% of students who took at least one course on-campus enrolled at Boise State, and 41.0% of students who did not come to campus chose Boise State University for their undergraduate education ($\chi^2=10.35$, df=2, p=.0056).

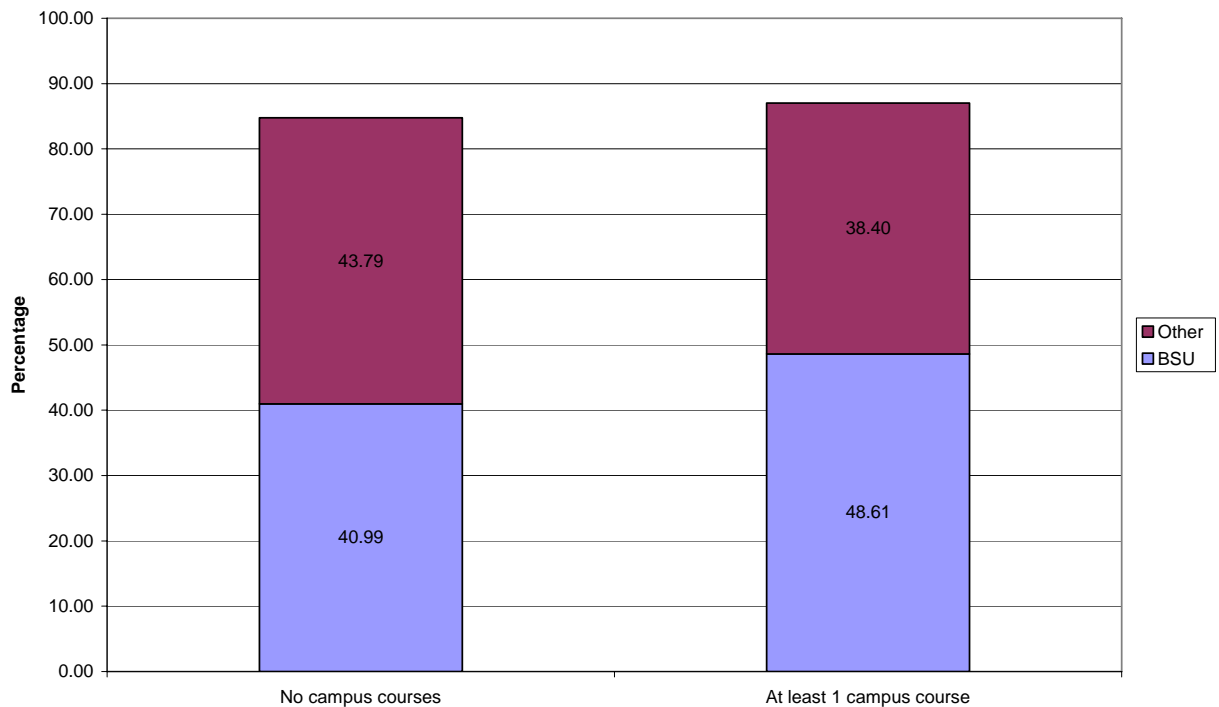
Although at first blush it may appear that taking courses on campus *causes* students to enroll at Boise State University more frequently, other explanations are possible as well. These students may have already been predisposed to attend Boise State University so they were particularly anxious to “try out” the campus by taking a course on-campus. However, it may also be that walking the campus and sitting in classes with BSU faculty helped students envision themselves as Boise State students. And perhaps the kinds of courses that were more likely to be offered on campus appealed to the kind of student who eventually enrolled at Boise State as a new freshman.

³ This analysis excludes concurrent enrollees in technical programs

What GPAs do former concurrent enrollees earn their first semester at Boise State compared to other first-time-in-college degree-seeking students?

Former concurrent enrollees perform better their first semester at Boise State University than do other full-time first-time-in-college students. Their average first semester GPA was 2.71 compared to 2.48 for non-concurrent enrollees.

Figure 3. Percentage Attending Boise State After Graduation Based on Where Concurrent Courses were Taken During High School



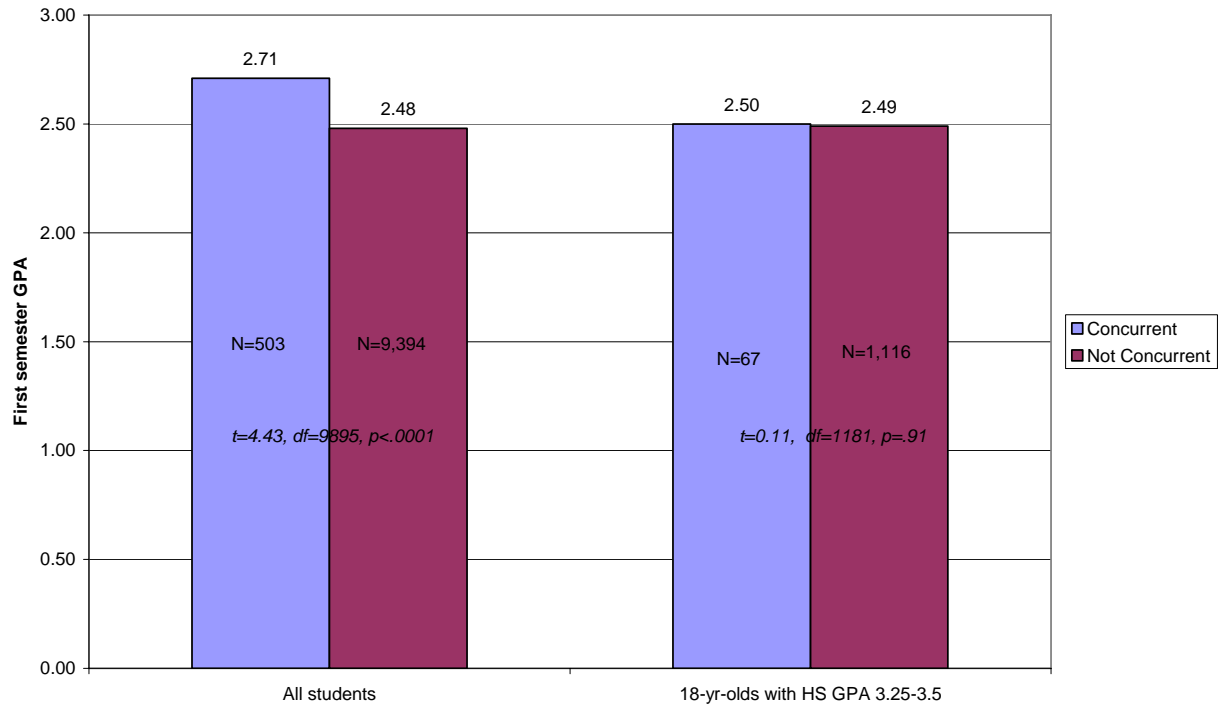
It may be that concurrent enrollment is the reason that students perform better in their classes when they arrive at college, perhaps in part as a result of the rigor of the college courses they experienced in high school. However, an alternate explanation is that the difference in first semester GPA is a result of the characteristics of the students who chose to take concurrent courses. Recall that concurrent enrollees arrive at Boise State University younger and more academically prepared (as measured by high school GPAs) than are non-concurrent enrollees. In previous studies, high school GPA in particular has shown a strong positive relationship to first semester GPA in college.

Therefore, to better determine the relationship between concurrent enrollment and college performance, the effects of high school GPA and age were controlled for by using regression analysis that included age and high school GPA in the regression model before examining the relationship of concurrent status and first semester GPA.⁴ When such an analysis was carried

⁴ Readers interested in the statistical details should refer to Appendix A.

out, it was found that concurrent enrollment was no longer correlated with first term GPA. For example, Figure 4 below shows the first term GPAs for all students and for 18-year-olds with high school GPAs between 3.25 and 3.5. Note how first semester GPAs do not differ for concurrent and non-concurrent enrollees when age and high school GPA are controlled.

Figure 4. First Semester GPA by Concurrent Status for All Students Compared to 18-year-olds with High School GPAs Between 3.25 and 3.5



What is the retention rate for concurrent students who attend Boise State University after their high school graduation? Is this rate different than that for all new students?

Former concurrent enrollees were significantly more likely to be enrolled one year after initial enrollment in college than were other first-time full-time students. Although 72.2% of concurrent enrollees returned, only 62.6% of other new freshmen were enrolled one year later ($\chi^2=18.79$, $df=1$, $p<.0001$).

Concurrent enrollment *may* facilitate higher retention rates: perhaps enrollment in concurrent courses strengthens students’ resolve to complete a college degree or the early exposure to college makes the adjustment to college easier. However, it is also possible that students who initially chose to take concurrent courses already had the academic and personal skills required to persist in college.

To truly answer this question, students would have to be randomly assigned in high school to take concurrent courses or not, and this is very unlikely to occur. The next best approach is to employ a logistic regression model that uses age and high school GPA to control initial

differences between the two groups and then determine whether retention could be predicted by concurrent status.

Such an analysis found that after controlling for the effects of age and high school GPA, concurrent enrollees still were about 33% more likely to be retained. Figure 5 shows the relationship between high school GPA and the probability of being retained one year later for 18-year-old students⁵. Note that the probability of being retained increases as high school GPA increases but that concurrent enrollees are significantly more likely to be retained at every level of high school GPA.

Although age and high school GPA have been used in this analysis to make the two groups more comparable, many factors likely remain that differ between the two groups and affect their retention rates. For example, concurrent enrollees probably have a stronger desire to complete their college degrees quickly because they started enrolling in college courses while in high school. This desire could translate into a greater likelihood of being retained.

Does concurrent enrollment correlate with the probability of college graduation?

As shown by Figure 6 below, students who attend Boise State University after taking concurrent enrollment courses in high school generally have much higher graduation rates than other first-time-in-college students. At the four-year mark, concurrent enrollees graduation rates are almost double ($\chi^2=17.94$, $df=1$, $p<.0001$). At the six-year mark, they still maintain a significant advantage ($\chi^2=13.74$, $df=1$, $p=.0002$).

Again, however, it is unlikely that concurrent enrollees are similar to other freshmen in all ways. As mentioned previously, concurrent enrollees are younger, they have higher high school GPAs, and they have already demonstrated their desire to complete their college degrees quickly by enrolling in college courses during high school. Just as this desire probably affects their retention rates, it will also affect their graduation rates.

To control for the effects of high school GPA and age on college graduation, a logistic regression model was employed where the relationship of the probability of college graduation and concurrent status was determined after including age and high school GPA in the model. After accounting for the effects of differing ages and high school GPAs, concurrent enrollees had significantly higher graduation rates at the four-year mark (see Figure 7). Note that concurrent enrollees are approximately 1.5 times more likely to graduate across the spectrum of high school GPAs, according to the logistic regression model.

⁵ Because age was also a significant predictor of retention, other ages have different sets of probabilities. However, the largest number of new students were 18 years of age, so this group was chosen to illustrate the change in first semester GPA when age and high school GPA were similar for the two groups.

Figure 5. Probability of Returning Based on High School GPA and Concurrent Status for 18-year-olds

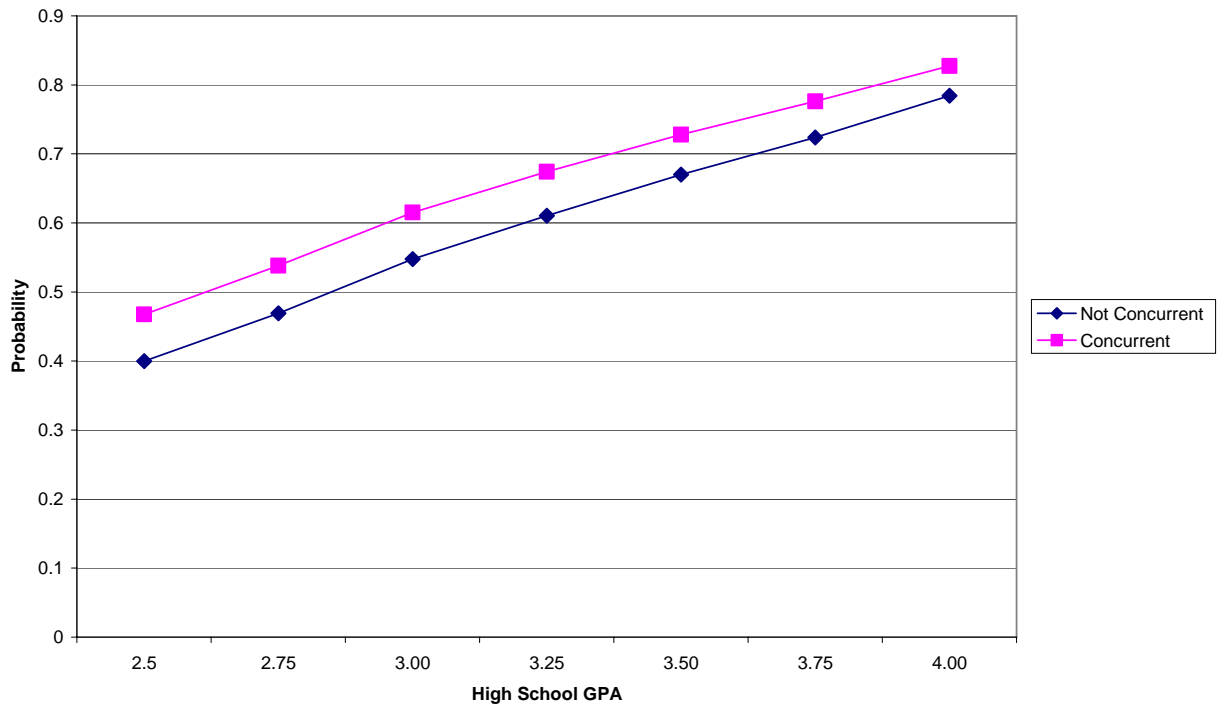
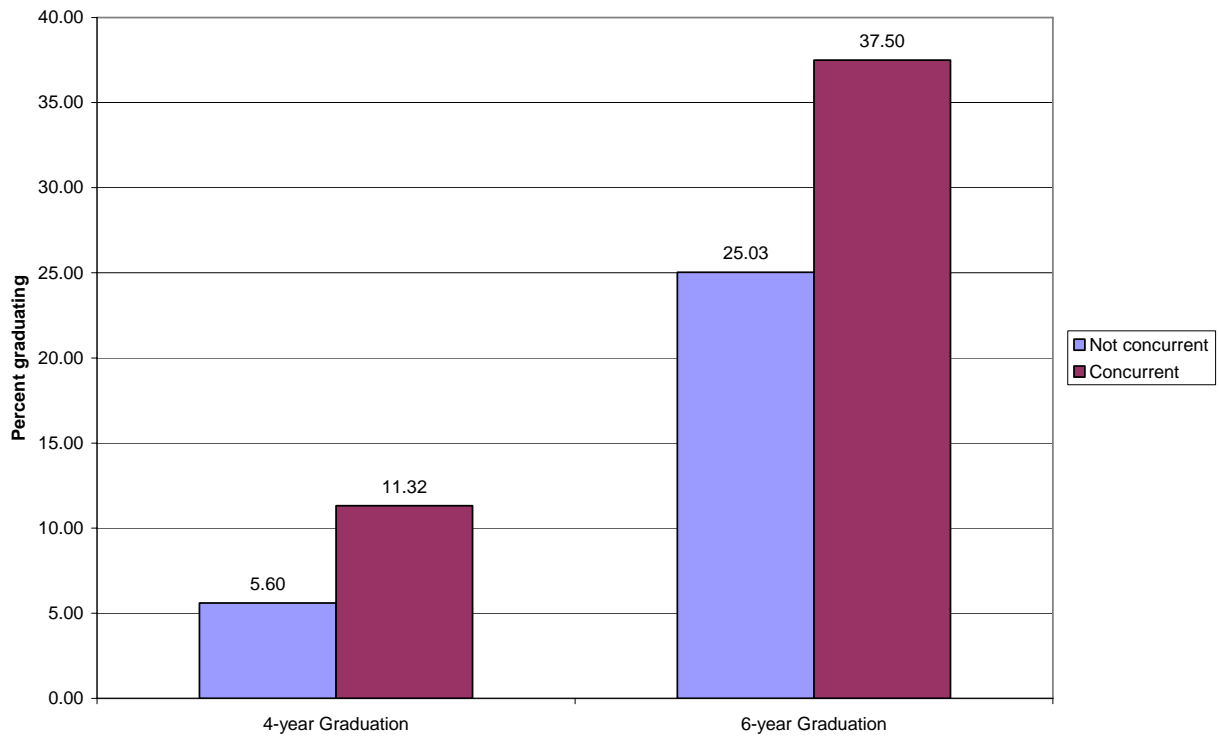


Figure 6. Percent Graduating After Four and Six Years by Concurrent Status



Because the logistic regression analysis revealed a statically significant interaction between concurrent enrollment and minority status, separate analyses were performed for minority and non-minority students. For non-minority students, concurrent enrollment was unrelated to graduation after six years; the only predictor needed was high school GPA. For minority students, both concurrent enrollment and high school GPA were related to the probability of graduating in six years: concurrently enrolled minority students showed a greater probability of graduating. These relationships are displayed in Figure 8.

These analyses indicate that concurrent enrollment in high school is related to higher graduation rates after four years and after six years for minority students. We must remain aware, however, that a number of factors affecting the initial choice to concurrently enroll may be related to graduation rates.

For concurrent enrollees, does the number of concurrent credits completed during high school relate to the probability of graduating from college?

Most BSU concurrent enrollees complete the equivalent of less than two college courses while in high school with the average being 5.6 credits. About 60% complete less than 5 credits while only 5% complete a full semester of 15 or more credits while in high school. Are the students with more concurrent credits also the ones more likely to graduate?

To address the question, logistic regression was again used to control for age and high school GPA before assessing the relationship between the probability of graduating and the number of concurrent credits earned. The results showed that the number of college credits earned while students were in high school was related to the likelihood of graduating in both four and six years. Figure 9 below shows the probability of graduating using the example of concurrently enrolled students who attained a high school GPA of 3.5. Probabilities would differ, of course, for other high school GPAs⁶.

Again, we must be careful regarding the inference of causation because the number of concurrent credits may not directly affect the probability of graduation but instead may be the most visible part of a confluence of factors that includes personal (e.g., goal orientation) and environmental (e.g., family support) components that also affect the likelihood of graduating from college. In this case, all students had chosen to enroll in concurrent courses. The argument could still be made, however, that it was the characteristics of the students who completed more credits rather than the credits themselves that were related to higher graduation rates.

⁶ Age was not a significant factor for this analysis, perhaps because students' ages were so similar.

Figure 7. Probability of Graduating in Four Years based on Concurrent Status and High School GPA

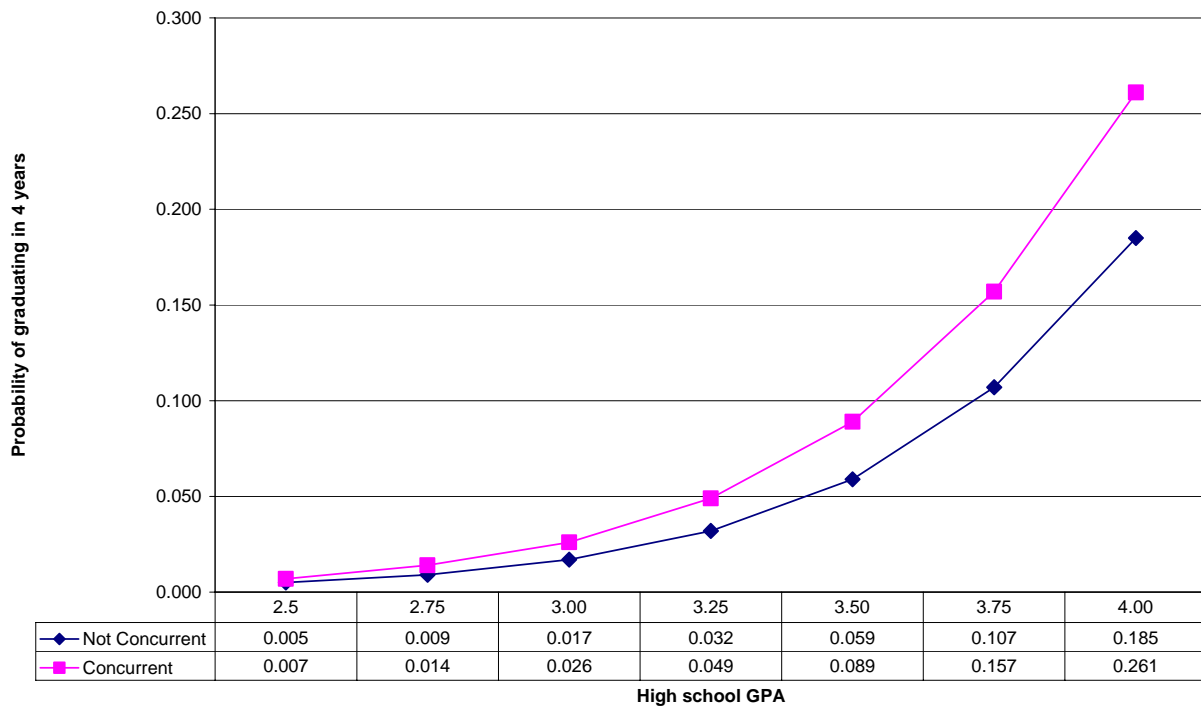
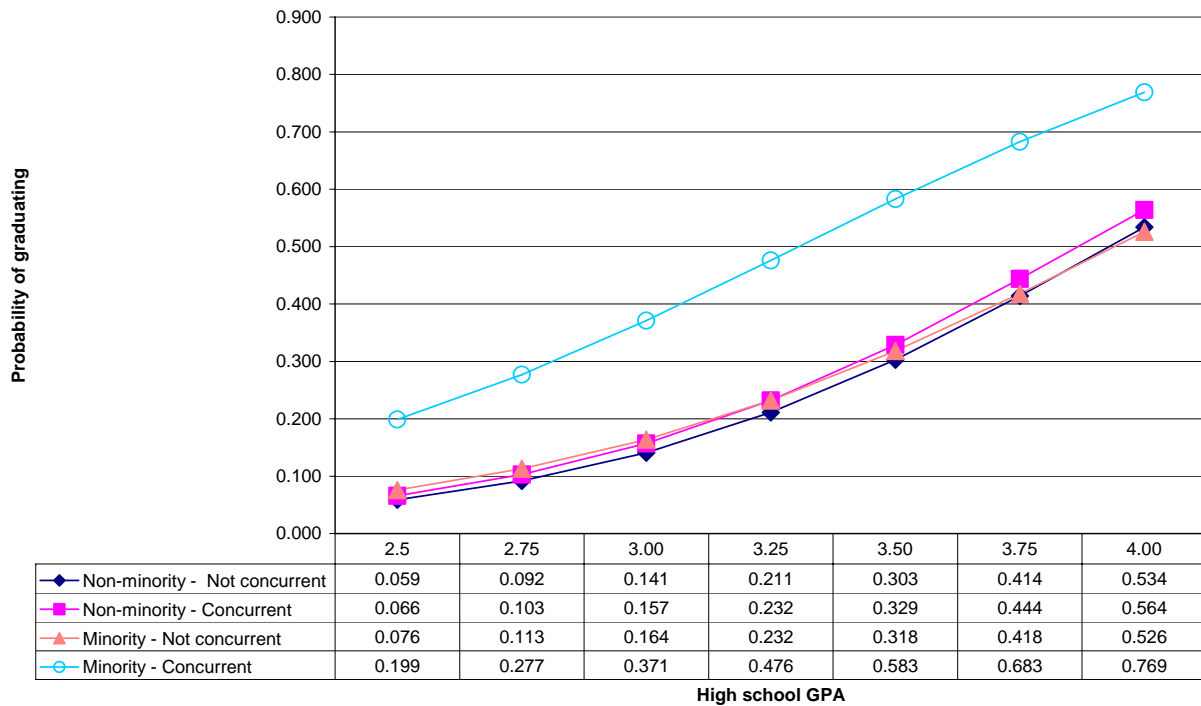
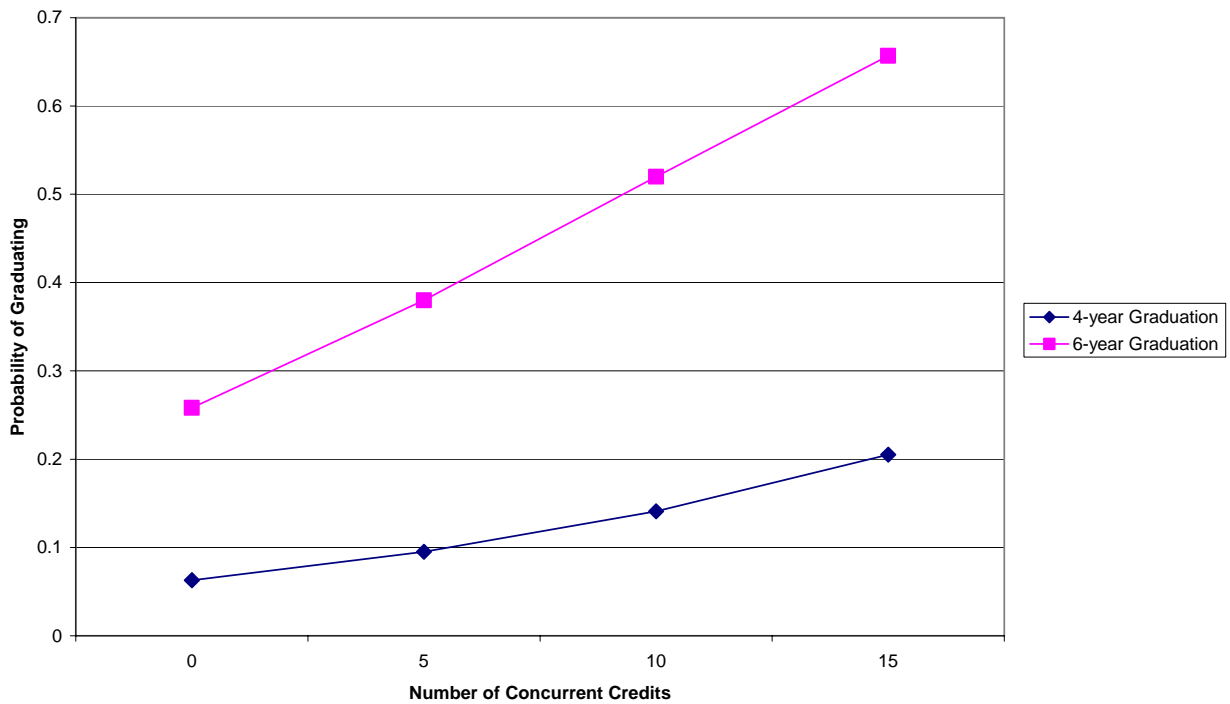


Figure 8. Probability of Graduating in Six Years Based on High School GPA, Minority Status, and Concurrent Enrollment Status



**Figure 9. Probability of Graduating Based on Number of Concurrent Credits Earned
An Example Using Concurrent Students with High School GPAs of 3.5**



Summary and Conclusions

This study sought to compare concurrently enrolled students to students who did not enroll for concurrent credits in high school in the following areas: choosing to attend college, getting good grades in college, and remaining in and graduating from college. Results clearly show that concurrent enrollment is a reliable indicator of college attendance and success. However, because concurrent enrollees are so different from their peers, beginning with their personal choice to take college courses while still in high school, it is difficult to disentangle the effects of the concurrent enrollment experience from the characteristics of the students who choose to engage in that experience.

Statistical Appendix

This study employed somewhat different definitions of “student” depending upon the question being answered. The research questions are repeated below along with the definition and group size employed in addressing each question.

Question:	Definition of students included:	Group sizes
At what rate do concurrently enrolled students go to college? How does that rate compare to all recent high school graduates?	The <i>Digest of Education Statistics</i> information is based on all 2003-4 Idaho high school graduates. Since we did not have access to data on all concurrently enrolled Idaho high school graduates who graduated in 2003-4, the concurrent comparison was limited to students who enrolled for concurrent credits through BSU and graduated from high school in 2003-4	All high school graduates: 16,054; BSU concurrent enrollees: 415
Are concurrent enrollees who attend BSU following their high school graduation demographically similar to other FTIC students?	Includes all first-time full-time bachelor’s degree seeking students who first enrolled at BSU for the fall terms of 2000 through 2006 with high school GPAs between 2.5 and 4.0 ⁷ .	Not concurrent enrollee: 9,394 Concurrent enrollee: 503
Is there a relationship between taking concurrent enrollment classes on the BSU campus and enrollment following graduation?	Includes all concurrently enrolled high school students who were enrolled in the academic track and who took courses between summer of 1999 and spring of 2008	Took courses off campus: 2,254 Took courses on campus: 539
What is the relationship between concurrent enrollment and first-semester GPA?	Includes all first-time full-time bachelor’s degree seeking students who first enrolled at BSU for the fall terms of 2000 through 2006 with high school GPAs between 2.5 and 4.0.	Not concurrent enrollee: 9,394 Concurrent enrollee: 503
What is the relationship between concurrent enrollment and fall-to-fall retention?	Includes all first-time full-time bachelor’s degree seeking students who first enrolled at BSU for the fall terms of 2000 through 2006 with high school GPAs between 2.5 and 4.0.	Not concurrent enrollee: 9,394 Concurrent enrollee: 503
What is the relationship between concurrent enrollment and graduation in four years?	Includes all first-time full-time bachelor’s degree seeking students who first enrolled at BSU for the fall terms of 2000 through 2004 with high school GPAs between 2.5 and 4.0. Students had to receive a bachelor’s degree in order to be counted as having graduated.	Not concurrent enrollee: 6,445 Concurrent enrollee: 318

⁷ It was believed that the students who fell outside these parameters represented special cases or bad data and should be excluded from the analysis. Of the 1,618 excluded, 2 had GPAs above 4.0, 120 had GPAs of 0.0, 42 had GPAs below 2.0, and 644 had GPAs between 2.0 and 2.49. Only two of those eliminated were concurrent enrollees, so this decision also helped equalize the groups in terms of high school GPA.

Question:	Definition of students included:	Group sizes
What is the relationship between concurrent enrollment and graduation in six years?	Includes all first-time full-time bachelor's degree seeking students who first enrolled at BSU for the fall terms of 2000 through 2002 with high school GPAs between 2.5 and 4.0. Students had to receive a bachelor's degree in order to be counted as having graduated. Minority status also needed to be included in this analysis.	Minority: 449 non-concurrent and 21 concurrent enrollees; Non-minority: 3,378 non-concurrent and 155 concurrent enrollees
For concurrent enrollees, does the number of concurrent credits completed during high school relate to the probability of graduating from college?	Includes only concurrent enrollees who fit the definitions above for four-year and six-year graduation.	Four-year: 319 (including 36 graduates) Six-year: 177 (including 66 graduates)

Statistical analyses were carried out in SAS using the regression procedure for the prediction of first semester GPA and the logistic procedure for the bivariate outcomes of retention, four-year graduation, and six-year graduation. In each case, the full model included the following variables along with the interaction effects between each variable and concurrent enrollment status:

- Minority status (0/1)
- Male (0/1)
- Age when first enrolled at Boise State University (continuous)
- High school GPA (continuous)
- Year of first enrollment at Boise State University (0=Fall of 2000 ... 6=Fall of 2006)
- Concurrent enrollment status (0/1)

No significant interactions were found except for the prediction of the probability of graduation in six years where a borderline significant interaction was found between minority status and concurrent enrollment status ($p=.056$) resulting in the decision to undertake separate regression analyses for minority and non-minority students. Otherwise, minority status, sex, and year of enrollment failed to reach statistical significance so these variables were deleted from the model. For each outcome of interest (first semester GPA, one-year retention, four-year graduation, six-year graduation), the model included age, high school GPA, and concurrent enrollment status.

Prediction equations and other details are available from the author.