

Getting Off to a Good Start: Success in the First Year and Graduation Rates

The Graduation Rates Work Group has been considering the importance of staying on track towards the degree. One test of that premise is to examine the relationship of first year GPA and the number of credits accumulated to later graduation. I examined graduation rates for four cohorts of first-time full-time freshmen and for two cohorts of full-time transfers by credit level at the time of entry.

For both freshmen and transfers in each cohort, students who returned for the second year with at least 24 credits and a 2.5 GPA for the first year were much more likely to go on to graduate than were students who attained neither of those levels. For example, in the fall 2004 cohort of first time freshmen, 72.6% of the students who returned for the second year with at least 24 credits and a 2.5 or higher GPA graduated. Only 30.1% of the students with less than 24 credits and a 2.5 GPA graduated.

The numbers of credits that a student accumulates and the GPA attained are related to several admissions variables at statistically significant levels. For each freshman cohort, I ran simple regressions for GPA at the beginning of the second year with DSP status, high school GPA, and Verbal and Math SAT scores as independent variables, and then did the same for the number of credits accumulated. In every case, high school GPA was related to the first year GPA and to the number of credits accumulated at the highest significance level. Table 1 identifies the significant variables for each cohort.

Table 1: Statistical Significance of the Relationship of Certain Variables To First Year GPA and the Number of Credits Accumulated

GPA at the Beginning of the Second Year				
Cohort	DSP	H.S. GPA	Verbal SAT	Math SAT
Fall 2003	No	Yes	Yes	Yes
Fall 2004	No	Yes	Yes	Yes
Fall 2005	No	Yes	Yes	No
Fall 2006	No	Yes	No	No
Number of Credits the Beginning of the Second Year				
Cohort	DSP	H.S. GPA	Verbal SAT	Math SAT
Fall 2003	No	Yes	Yes	No
Fall 2004	Yes	Yes	Yes	No
Fall 2005	No	Yes	Yes	Yes
Fall 2006	Yes	Yes	Yes	No

The situation for transfers is less clear. Our admissions files have only the transfer GPA as a quality measure. In the 2003 cohort, the GPA was significantly related to both first year GPA and the number of credits accumulated. In the 2006 cohort, it was related to neither.

An analysis of the relationships of GPA and credit accumulation to success as measured by graduation begins on the following page.

First-Time Full-Time Freshmen

I looked at the fall 2003 through fall 2006 cohorts of first-time full-time freshmen after removing any CPCS students from the analysis because their progress towards the degree is measured by assessed competencies rather than by credits. I examined the four-year graduation rates for each cohort as well as the current rate as of fall 2010. The current rates are a seven-year rate for the 2003 cohort, a six-year rate for the 2004 cohort, a five-year graduation rate for the 2005 cohort, and a four-year rate for the 2006.

For the 2003, 2004, and 2005 cohorts I ran logistic regressions for the four-year graduation rate and the cumulative graduation rate. For 2006, the four-year rate is the only one available. The dependent variables were graduation at those points. The independent variables were high school GPA, Verbal SAT score, Math SAT score, gender, race/ethnicity with white non-Hispanic as the base, DSP status, the number of credits accumulated by the beginning of the second year and the cumulative GPA at the beginning of the second year. The numbers of credits, the cumulative GPA, or both were significantly related to graduation in all seven regressions. No other variable was significant in more than one. The number of credits and the cumulative GPA were correlated at 0.448 or higher for the 2004-2006 cohorts. Full details of the regressions are available.

In order to demonstrate the differences more effectively I set up a number of comparisons to look at the graduation rates year by year for students who had returned for the second year with 30 credits or more and a GPA or 3.0 or higher versus those below those marks. At the request of several committee members, I did the same with lower cutoff points of 24 or more credits and a 2.5 or higher GPA.

A chart of four-year graduation rates for students who returned with 30 or more credits and a 3.0 or higher GPA and a second chart with the 24 credit and 2.5 GPA cutoffs are on the next page. Students who returned for the second year with less than 24 credits and less than a 2.5 GPA had virtually no chance of graduating within four years.

Figure 1: Four Year Graduation Rates by 3.0 GPA and 30 Credit Status at the Beginning of the Second Year

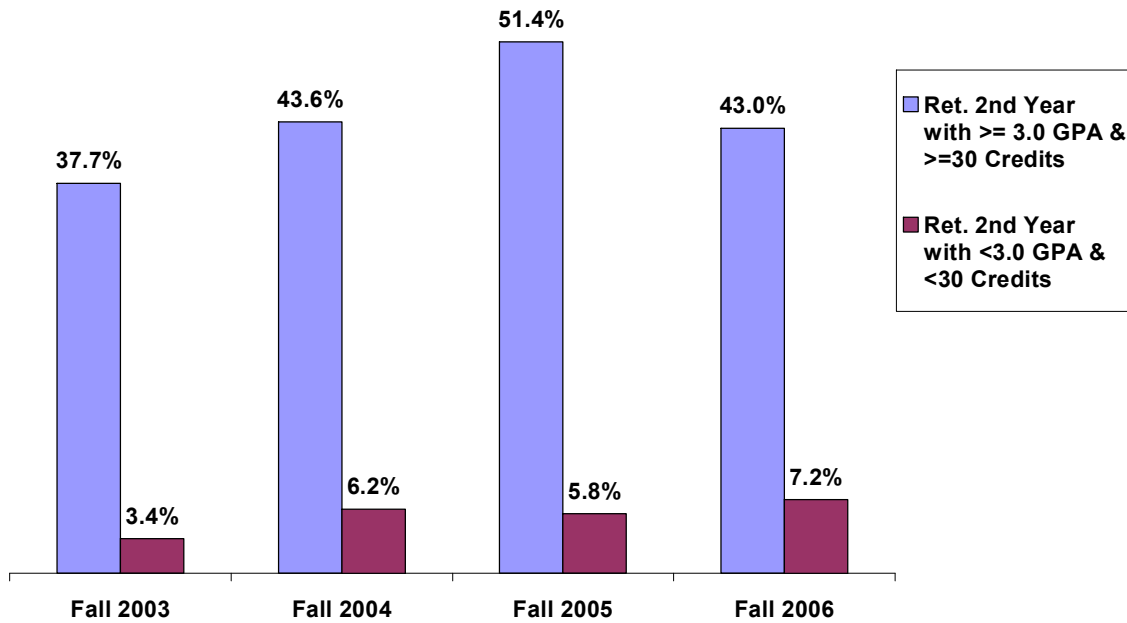
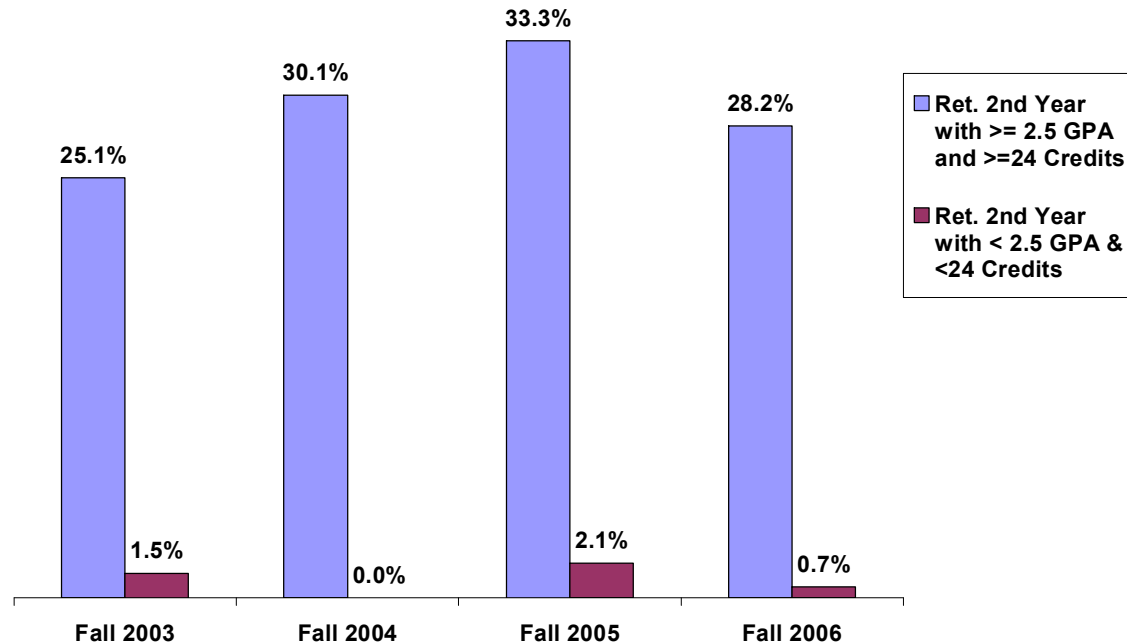


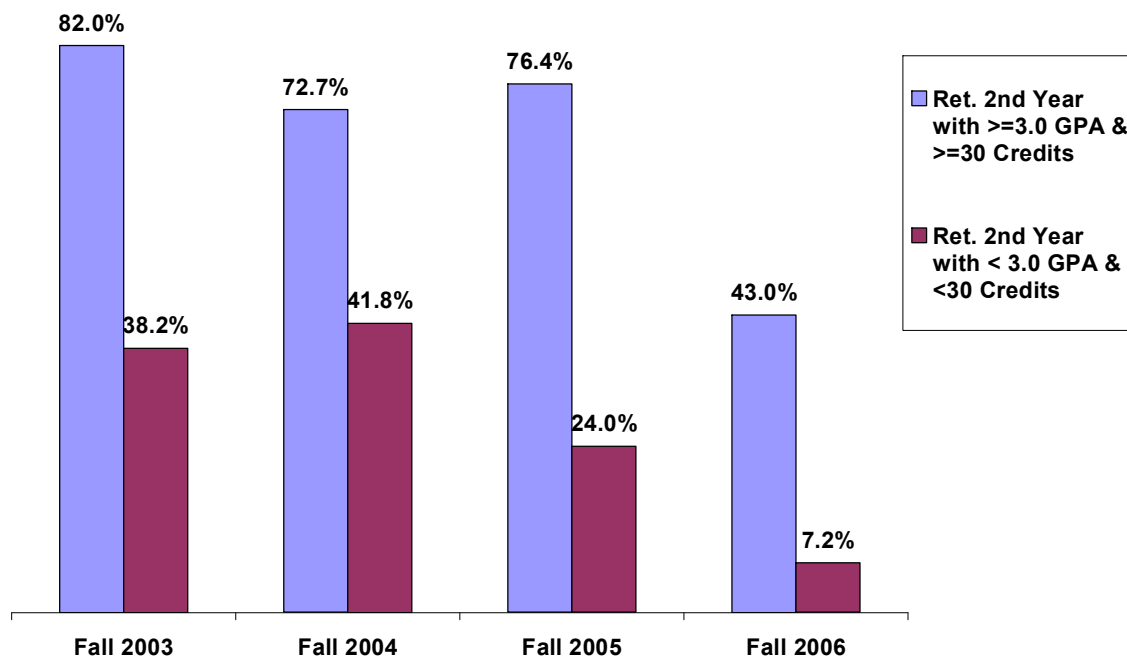
Figure 2: Four Year Graduation Rates by 2.5 GPA and 24 Credit Status at the Beginning of the Second Year



Given that less than 14% of any full cohort has graduated within four years, looking at a four-year rate may be unrealistic. Therefore, I also looked at the current cumulative graduation rate for each of the cohorts with the same cutoff points. Again, that is a seven-year rate for the 2003 cohort but only a four-year rate for the 2006 cohort.

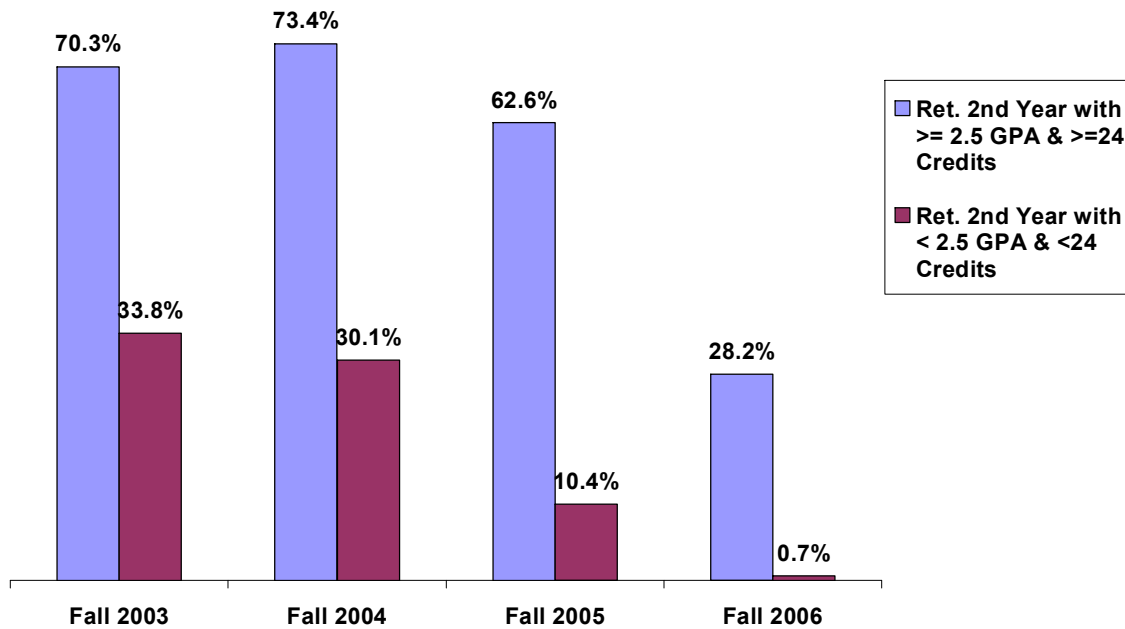
As can be seen in Figure 3 below, in the 2003 cohort, students who returned with 30 or more credits and at least a 3.0 GPA were more than twice as likely to have graduated by fall 2010 as those who did not attain those marks. Members of the 2005 cohort who returned with the 3.0 and 30 credits were three times as likely to have graduated by 2010 (a 5-year rate).

Figure 3: Graduation Rates by Fall 2010 by 3.0 GPA and 30 Credit Status at the Beginning of the Second Year



While their rates were not as high as with the 3.0 GPA and 30 credits cutoffs, students who returned with a 2.5 GPA and at least 24 credits were much more likely to have graduated than those who had not. In the 2005 cohort, they were six times as likely to have graduated by 2010. The details are presented in Figure 4.

Figure 4: Graduation Rates by Fall 2010 by 2.5 GPA and 24 Credit Status at the Beginning of the Second Year



A complete table of year by year freshman graduation rates for the various combinations of credits and GPAs is presented in Appendix 1 on page 10.

In addition to looking at the credits and GPA combinations, at the request of several committee members, I also looked at credits alone by the 30 credit and 24 credit cutoffs, and GPAs alone by the 3.0 and 2.5 cutoffs. I ran significance of differences tests for all of the comparisons of credits and of GPAs and found that the differences were statistically significant at the highest level for each of the comparisons. Overall, the better the students did in the first year as measured by GPA, credits, or a combination of the two, the more likely they were to graduate and the sooner they were likely to graduate.

One of the members of the Graduation Rates Work Group Data Sub-Committee observed that there is a persistent myth that our best students leave to finish at a more prestigious institution. This demonstrates that our better students (as measured by first year performance) tend to stay and to graduate in less time than the less successful students.

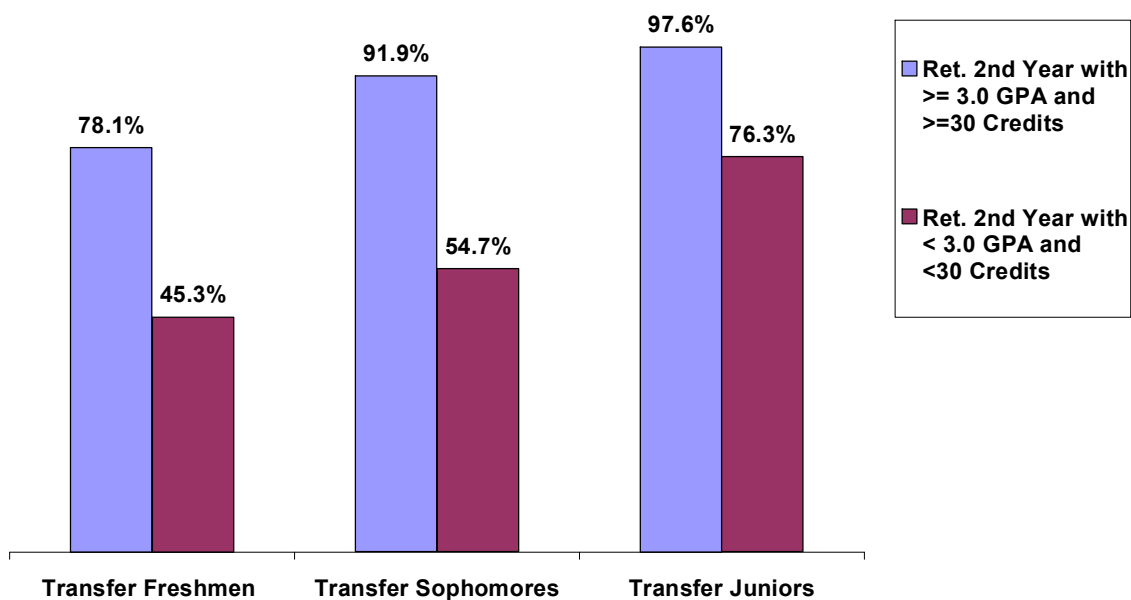
Transfer Students by Transfer Level

We examined two cohorts of transfer students; those who entered in fall 2003 and those who entered in fall 2006. I broke each cohort into three groups by credit level. Transfer freshmen entered with six or more but fewer than 30 credits. Sophomores had 30 or more but fewer than 60 credits, and juniors had 60 or more but fewer than 90 credits. There were too few students entering with 90 or more credits to make any analysis meaningful. I limited the analysis to transfer students who entered with full-time status in the first semester.

I ran logistic regressions for the 2003 cohort for graduation by 2007, 2008, 2009, and 2010 for each student entry level. The dependent variables were graduation at those points. The independent variables were transfer GPA, gender, race/ethnicity with white non-Hispanic as the base, the number of credits accumulated by the beginning of the second year and the cumulative GPA at the beginning of the second year. The numbers of credits, the cumulative GPA, or both were significant in each of the 12 regressions. Just two other variables were significant in even one regression. The detailed regression output is available for review.

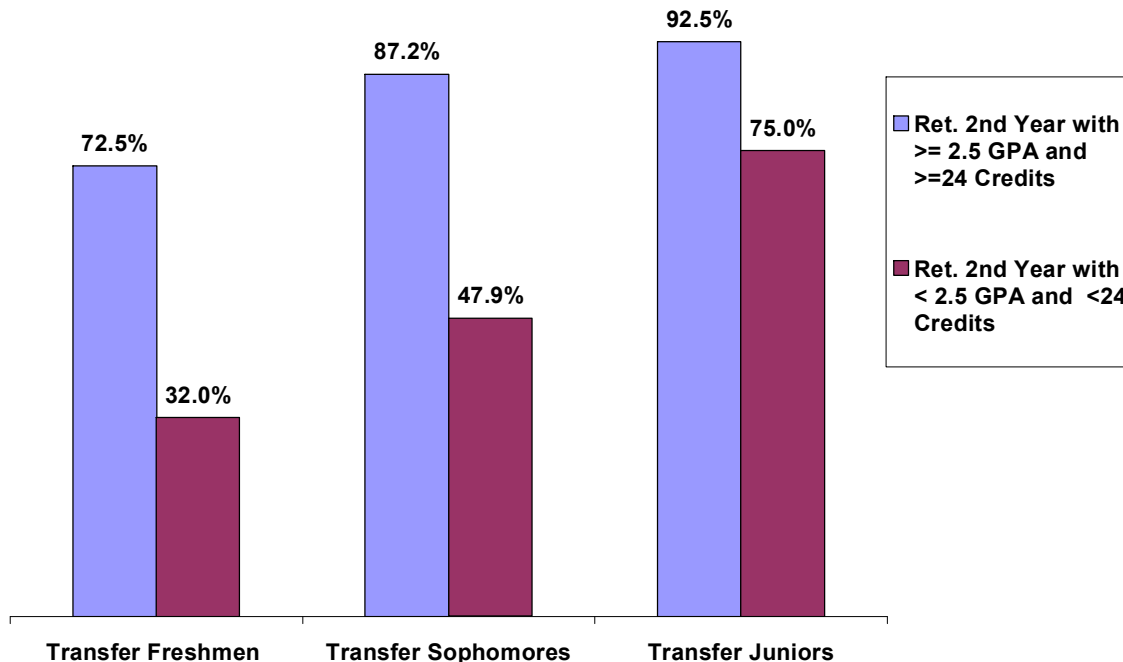
Students who entered with higher numbers of credits were more likely to graduate. As with the freshmen, the transfer students with 30 credits and at least a 3.0 GPA in the first year were markedly more successful than those who did not. Details are presented in Figure 5.

Figure 5: 2003 Cohort Graduation Rates by Fall 2010 by Entry Level, 3.0 GPA, And 30 Credit Status at the Beginning of the Second Year



Fewer than half of the 2003 transfer freshmen or sophomores persisted to graduation if they returned for the second year with fewer than 24 credits and less than a 2.5 GPA. Although 75% of the transfer juniors with less than a 2.5 and 24 credits graduated, it is a very small group, only 9 out of 12 students. Details are presented in Figure 6.

Figure 6: 2003 Cohort Graduation Rates by Fall 2010 by Entry Level, 2.5 GPA, And 24 Credit Status at the Beginning of the Second Year



I also examined the graduation rates of the 2006 cohort and ran logistic regressions for graduation by fall 2008, fall 2009, and fall 2010 for each student entry level. The variables were the same as for 2003. The numbers of credits, the cumulative GPA, or both were significant in each of the 12 regressions. Just two other variables were significant in even one regression. The regression output is available for review.

I also looked at graduation rates by the same credit and GPA levels as the freshmen. One notable result was that while 58% of the freshmen transfer students who had at least a 2.5 GPA and 24 credits in the first year had graduated by fall 2010, only 3% of the students below both of those marks had graduated. The graduation rates for the 2006 cohort broken out by GPA and credit level are presented in Figures 7 and 8 on the following page. A table with all of the combinations of credits and GPA tested is presented in Appendix 2 on page 12.

Overall, success in the first year is highly correlated with graduation for incoming freshmen and for incoming transfer students at all levels. We need to be able to understand what factors contribute most to a successful first year.

Figure 7: 2006 Cohort Graduation Rates by Fall 2010 by Entry Level, 3.0 GPA, And 30 Credit Status at the Beginning of the Second Year

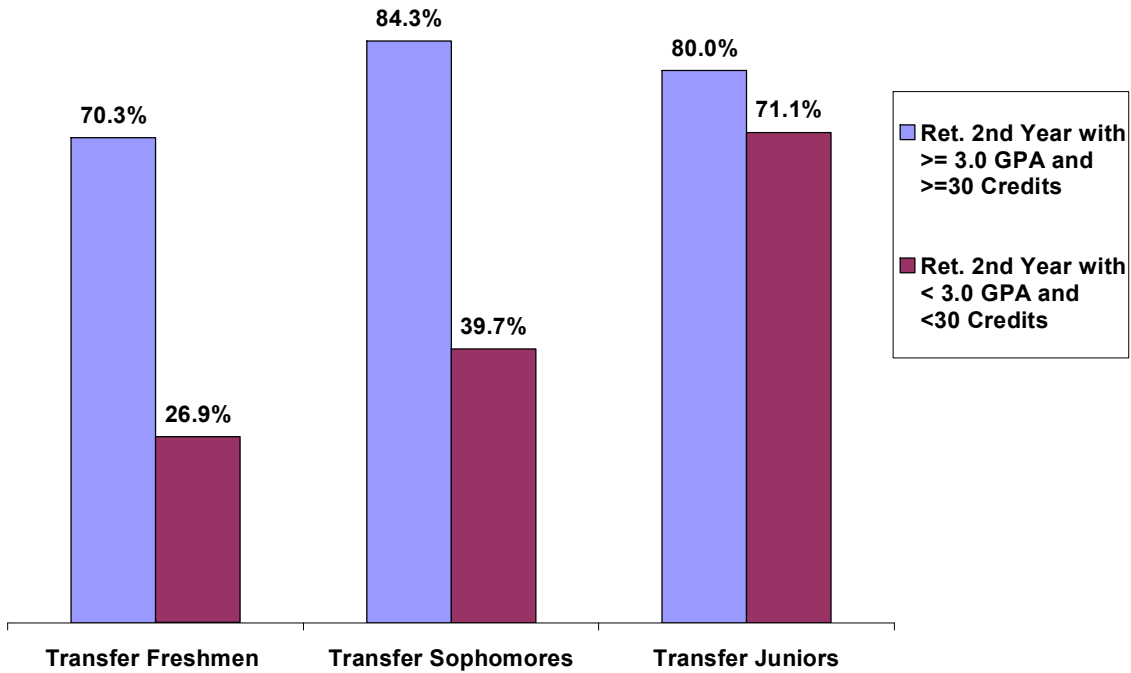
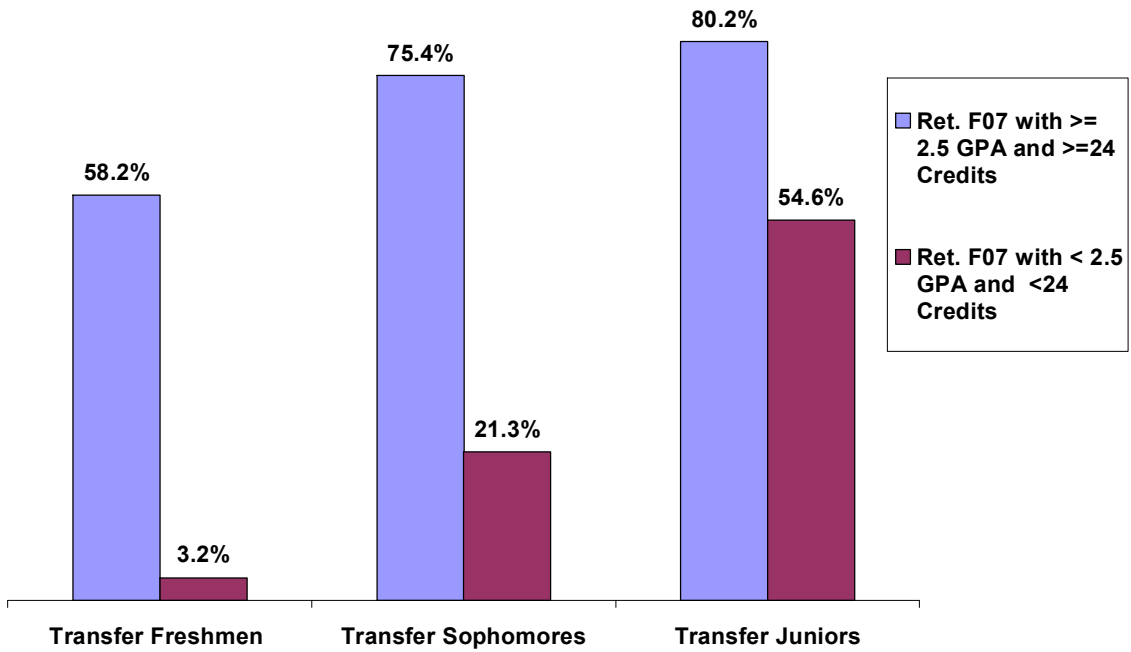


Figure 8: 2006 Cohort Graduation Rates by Fall 2010 by Entry Level, 2.5 GPA, And 24 Credit Status at the Beginning of the Second Year



Overall, success in the first year as measured by GPA and the number of credits accumulated is strongly related to the likelihood of graduating and of graduating sooner. We know that the first year GPA and number of credits are related to factors we can identify as the student enters UMass Boston. DSP status was related to the number of credits accumulated which is understandable given that many DSP students take some ESL or other non-credit courses in the first year. High school GPA and at least one of the SAT scores were related to every measure in each cohort except GPA for the 2006 cohort.

However, if a student returns for the second year, what matters then is how well the student did in the first year. DSP status, high school GPA, and SAT scores are no longer significant in the regression models. The key to improving graduation rates may be to focus on encouraging student success in the first year as measured by both by GPA and in the number of credits successfully completed. In other words, we need to make sure that the students start on track and stay on track.

Appendix 1: Freshman Graduation Rates

Fall 2003 Entering Cohort (545 Students)	Number	Grad. in 4 Years	Grad. in 5 Years	Grad. in 6 Years	Grad. in 7 Years
Ret. F04 with >= 3.0 GPA and >=30 Credits	61	37.7%	73.8%	80.3%	82.0%
Ret. F04 with < 3.0 GPA but >=30 Credits	7	14.3%	42.9%	57.1%	57.1%
Ret. F04 with >= 3.0 GPA but <30 Credits	136	20.6%	55.9%	66.9%	69.9%
Ret. F04 with < 3.0 GPA and <30 Credits	178	3.4%	23.0%	34.8%	38.2%
Ret. F04 with >= 2.5 GPA and >=24 Credits	195	25.1%	59.0%	68.2%	70.3%
Ret. F04 with <2.5 GPA but >= <24 Credits	34	5.9%	20.6%	35.3%	41.2%
Ret. F04 with >=2.5 GPA but <24 Credits	85	7.1%	32.9%	48.2%	50.6%
Ret. F04 with < 2.5 GPA & <24 Credits	68	1.5%	22.1%	29.4%	33.8%
Fall 2004 Entering Cohort (518 Students)	Number	Grad. in 4 Years	Grad. in 5 Years	Grad. in 6 Years	
Ret. F05 with >= 3.0 GPA and >=30 Credits	55	43.6%	69.1%	72.7%	
Ret. F05 with < 3.0 GPA but >=30 Credits	17	17.6%	58.8%	82.4%	
Ret. F05 with >= 3.0 GPA but <30 Credits	112	19.6%	53.6%	66.1%	
Ret. F05 with < 3.0 GPA and <30 Credits	177	6.2%	31.6%	41.8%	
Ret. F05 with >= 2.5 GPA and >=24 Credits	173	30.1%	63.6%	73.4%	
Ret. F05 with < 2.5 GPA but >=24 Credits	24	8.3%	25.0%	33.3%	
Ret. F05 with >= 2.5 GPA but <24 Credits	91	6.6%	35.2%	49.5%	
Ret. F05 with < 2.5 GPA & <24 Credits	73	0.0%	21.9%	30.1%	
Fall 2005 Entering Cohort (714 Students)	Number	Grad. in 4 Years	Grad. in 5 Years		
Ret. F06 with >= 3.0 GPA and >=30 Credits	72	55.1%	76.4%		
Ret. F06 with < 3.0 GPA but >=30 Credits	19	21.1%	47.4%		
Ret. F06 with >= 3.0 GPA but <30 Credits	188	24.5%	55.3%		
Ret. F06 with < 3.0 GPA and <30 Credits	225	5.8%	24.0%		

Fall 2005 Entering Cohort (714 Students)	Number	Grad. in 4 Years	Grad. in 5 Years		
Ret. F06 with >= 2.5 GPA and >=24 Credits	273	33.3%	62.6%		
Ret. F06 with < 2.5 GPA but >=24 Credits	25	8.0%	28.0%		
Ret. F06 with >= 2.5 GPA & <24 Credits	110	4.6%	30.9%		
Ret. F06 with < 2.5 GPA & <24 Credits	96	2.1%	10.4%		
Fall 2006 Entering Cohort (835 Students)	Number	Grad. in 4 Years			
Ret. F06 with >= 3.0 GPA and >=30 Credits	86	43.0%			
Ret. F06 with < 3.0 GPA but >=30 Credits	24	29.2%			
Ret. F06 with >= 3.0 GPA but <30 Credits	216	17.6%			
Ret. F06 with <= 3.0 GPA and <30 Credits	293	7.2%			
Ret. F06 with >= 2.5 GPA and >=24 Credits	312	28.2%			
Ret. F06 with < 2.5 GPA but >=24 Credits	46	10.9%			
Ret. F06 with >= 2.5 GPA & <24 Credits	109	8.3%			
Ret. F06 with < 2.5 GPA & <24 Credits	152	0.7%			

Appendix 2: Transfer Student Graduation Rates

Fall 2003 Cohort						
		Grad. By F06	Grad. By F07	Grad. By F08	Grad. By F09	Grad. By F10
Transfer Freshmen (6 to 29 credits)	N					
Ret. F04 with \geq 3.0 GPA and \geq 30 Credits	32	37.5%	65.6%	75.0%	78.1%	78.1%
Ret. F04 with $<$ 3.0 GPA but \geq 30 Credits	17	11.8%	35.3%	58.8%	58.8%	58.8%
Ret. F04 with \geq 3.0 GPA but $<$ 30 Credits	55	12.7%	40.0%	50.9%	58.2%	58.2%
Ret. F04 with $<$ 3.0 GPA and $<$ 30 Credits	75	2.7%	18.7%	38.7%	42.7%	45.3%
Ret. F04 with \geq 2.5 GPA and \geq 24 Credits	91	22.0%	56.1%	67.0%	72.5%	72.5%
Ret. F04 with $<$ 2.5 GPA but \geq 24 Credits	15	6.7%	13.3%	26.7%	26.7%	33.3%
Ret. F04 with \geq 2.5 GPA but $<$ 24 Credits	48	4.2%	16.7%	41.7%	45.8%	45.8%
Ret. F04 with $<$ 2.5 GPA and $<$ 24 Credits	25	0.0%	8.0%	24.0%	28.0%	32.0%
Transfer Sophomores (30 to 59 credits)	N	Grad. By F06	Grad. By F07	Grad. By F08	Grad. By F09	Grad. By F10
Ret. F04 with \geq 3.0 GPA and \geq 30 Credits	74	83.8%	87.8%	89.2%	91.9%	91.9%
Ret. F04 with $<$ 3.0 GPA but \geq 30 Credits	44	61.4%	65.9%	72.7%	75.0%	77.3%
Ret. F04 with \geq 3.0 GPA but $<$ 30 Credits	93	35.5%	61.3%	67.7%	76.3%	76.3%
Ret. F04 with $<$ 3.0 GPA and $<$ 30 Credits	117	23.1%	45.3%	47.9%	53.0%	54.7%
Ret. F04 with \geq 2.5 GPA and \geq 24 Credits	188	63.8%	79.8%	83.5%	87.2%	87.2%
Ret. F04 with $<$ 2.5 GPA but \geq 24 Credits	23	21.7%	30.4%	30.4%	34.8%	39.1%
Ret. F04 with \geq 2.5 GPA but $<$ 24 Credits	69	23.2%	44.9%	49.3%	58.0%	59.4%
Ret. F04 with $<$ 2.5 GPA and $<$ 24 Credits	48	16.7%	33.3%	39.6%	45.8%	47.9%
Transfer Juniors (60 to 89 credits)	N	Grad. By F06	Grad. By F07	Grad. By F08	Grad. By F09	Grad. By F10
Ret. F04 with \geq 3.0 GPA and \geq 30 Credits	41	90.2%	97.6%	97.6%	97.6%	97.6%
Ret. F04 with $<$ 3.0 GPA but \geq 30 Credits	13	69.2%	92.3%	92.3%	92.3%	92.3%
Ret. F04 with \geq 3.0 GPA but $<$ 30 Credits	82	64.6%	72.0%	74.4%	76.8%	76.8%
Ret. F04 with \leq 3.0 GPA and $<$ 30 Credits	38	52.6%	68.4%	71.1%	76.3%	76.3%
Ret. F04 with \geq 2.5 GPA and \geq 24 Credits	107	83.2%	89.7%	91.6%	92.5%	92.5%
Ret. F04 with $<$ 2.5 GPA but \geq 24 Credits	3	0.0%	33.3%	33.3%	33.3%	33.3%
Ret. F04 with \geq 2.5 GPA but $<$ 24 Credits	52	46.2%	61.5%	61.5%	67.3%	67.3%
Ret. F04 with $<$ 2.5 GPA and $<$ 24 Credits	12	50.0%	66.7%	75.0%	75.0%	75.0%

Fall 2006 Cohort						
		Grad. By F07	Grad. By F08	Grad. By F09	Grad. By F10	
Transfer Freshmen (6 to 29 credits)	N					
Ret. F07 with \geq 3.0 GPA and \geq 30 Credits	37	0.0%	5.3%	21.6%	70.3%	
Ret. F07 with $<$ 3.0 GPA but \geq 30 Credits	19	0.0%	0.0%	26.3%	63.2%	
Ret. F07 with \geq 3.0 GPA but $<$ 30 Credits	64	0.0%	0.0%	10.9%	42.2%	
Ret. F07 with $<$ 3.0 GPA and $<$ 30 Credits	78	0.0%	0.0%	1.3%	26.9%	
Ret. F07 with \geq 2.5 GPA and \geq 24 Credits	110	0.0%	5.3%	15.5%	58.2%	
Ret. F07 with $<$ 2.5 GPA but \geq 24 Credits	19	0.0%	0.0%	21.1%	68.4%	
Ret. F07 with \geq 2.5 GPA but $<$ 24 Credits	38	0.0%	0.0%	0.0%	21.1%	
Ret. F07 with $<$ 2.5 GPA and $<$ 24 Credits	31	0.0%	0.0%	0.0%	3.2%	
Transfer Sophomores (30 to 59 credits)	N	Grad. By F07	Grad. By F08	Grad. By F09	Grad. By F10	
Ret. F07 with \geq 3.0 GPA and \geq 30 Credits	89	0.0%	23.6%	74.2%	84.3%	
Ret. F07 with $<$ 3.0 GPA but \geq 30 Credits	36	0.0%	27.8%	72.2%	86.1%	
Ret. F07 with \geq 3.0 GPA but $<$ 30 Credits	82	0.0%	4.9%	40.2%	54.9%	
Ret. F07 with \leq 3.0 GPA and $<$ 30 Credits	116	0.0%	4.3%	26.7%	39.7%	
Ret. F07 with \geq 2.5 GPA and \geq 24 Credits	207	0.0%	16.9%	62.3%	75.4%	
Ret. F07 with $<$ 2.5 GPA but \geq 24 Credits	27	0.0%	18.5%	48.2%	66.7%	
Ret. F07 with \geq 2.5 GPA but $<$ 24 Credits	42	0.0%	0.0%	19.1%	31.0%	
Ret. F07 with $<$ 2.5 GPA and $<$ 24 Credits	47	0.0%	0.0%	12.8%	21.3%	
Transfer Juniors (60 to 89 credits)	N	Grad. By F07	Grad. By F08	Grad. By F09	Grad. By F10	
Ret. F07 with \geq 3.0 GPA and \geq 30 Credits	45	0.0%	55.6%	75.6%	80.0%	
Ret. F07 with $<$ 3.0 GPA but \geq 30 Credits	17	0.0%	58.8%	64.7%	70.6%	
Ret. F07 with \geq 3.0 GPA but $<$ 30 Credits	37	0.0%	24.3%	64.9%	78.4%	
Ret. F07 with \leq 3.0 GPA and $<$ 30 Credits	38	0.0%	21.1%	52.6%	71.1%	
Ret. F07 with \geq 2.5 GPA and \geq 24 Credits	91	0.0%	45.1%	72.5%	80.2%	
Ret. F07 with $<$ 2.5 GPA but \geq 24 Credits	14	0.0%	57.1%	78.6%	78.6%	
Ret. F07 with \geq 2.5 GPA but $<$ 24 Credits	21	0.0%	4.8%	38.1%	66.7%	
Ret. F07 with $<$ 2.5 GPA and $<$ 24 Credits	11	0.0%	18.2%	36.4%	54.6%	