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Office of Institutional Research

PREDICTORS OF RETENTION AND PROGRESSION TOWARD GRADUATION

Part 2: Factors Predicting First-to-Second-Year Retention and Progression to Sophomore Status for the 2010 Cohort

EXECUTIVE SUMMARY

The Keene State College Office of Institutional Research is engaged in a multi-part study to understand factors that predict retention and degree completion. Part 1 of the study (Turrentine, 2011), examined the five freshman classes that entered KSC from 2006 through 2010. That study examined the pattern of first-to-second-year retention and progression to sophomore status by demographic groups. It found clear and consistent trends indicating that women, non-residents, first-generation students, racial/ethnic minority students, and low-income students may be at greater risk of first-to-second-year attrition than their classmates. However, the gaps in retention rates between these students and their classmates only rarely rose to the level of statistical significance during this five-year period. Part 1 found, further, that for retained students in the 2010 cohort, women were significantly more likely than men to attain sophomore status by their second year of enrollment, and white students were significantly more likely than students from racial/ethnic minorities to attain sophomore status by year 2.

The present study, Part 2 of the larger analysis, looks more deeply at just the 2010 cohort. The 2010 cohort was selected both because it is the most recent and also because its overall retention rate was equal to the mean for all the cohorts from 2006 through 2010. This analysis considers a larger set of factors beyond the demographic categories examined in Part 1, and it uses logistic regression to examine their relative value as predictors of retention and progression to sophomore status. The findings here are generally consistent with data from the large national *Toolbox Revisited* study (Adelman, 2006), and so they can be used with some confidence even though this study is based on only one cohort. These results provide a broad view of the patterns that are associated with student success in the first year of enrollment at Keene State College.

KEY FINDINGS

First-to-Second-Year Retention

- Although the Part 1 analysis found five-year trends showing lower retention rates for students in certain demographic groups, the present analysis concludes that what students do is far more powerful than who they are in predicting retention. When demographic variables are considered simultaneously with students' behaviors in college, the college variables explain most of the variation in retention.

- Far and away the best predictor of first-to-second-year retention is earning credit for ITW (either at KSC or by transfer) in year 1 of enrollment. Credit for ITW increases the probability of being retained by 32.4% (from 52.8% to 85.2%).

- Completing ITW in year 1 does more to improve the probability of retention for students in the at-risk groups examined in Part 1 of this study (women, racial/ethnic minority students, first-generation students, low-income students, non-residents) than for their peers who are not in these groups.

Progression of Retained Students to Sophomore Status

- For retained students, the best predictor of progression to sophomore status or higher in year 2 is successful completion of at least 16 credits in the first fall semester. Particularly for students in at-risk demographic groups, completing 16 credits in fall increases the likelihood of progression in status by about 40 percentage points.

- While demographic categories are not in and of themselves significantly predictive of progression to sophomore status, follow-up analysis revealed that students in four demographic groups are less likely than their peers to complete the 16 credits in fall that would help them advance in status: racial/ethnic minority students, low-income students, first-generation students, and New Hampshire residents.

- Students who have high school grade averages below 3.00 and students who are Undecided at entry are at significantly greater risk than their peers of being retained in freshman status rather than progressing to the sophomore class. This is true even when they earn 16 credits in the first fall semester. Students who are in both these categories (Undecided and HSGPA<3.00) are at particular risk for being retained as freshmen. Even with 16 successful fall credits, the probability of these students progressing to sophomore status is only 68.6%, compared to 90.3% of retained students with higher high school grades and a Decided major.

Implications

- The single best thing that Keene State College can do to increase the probability that freshman students will be retained to year 2 is to ensure that they successfully complete ITW in year 1.

- The single best thing that the College can do increase the probability that retained students will progress to sophomore status in year 2 is to assist them to successfully complete 16 credits in fall.

- Racial/ethnic minority students, low-income students, first-generation students, and New Hampshire residents may need particular support in advancing to sophomore status, since they are less likely than their peers to complete 16 credits in the first fall semester. The data in this study do not explain why this is so. Follow-up conversations with students in these groups could help to identify the reasons, and thereby to guide the interventions that would be of greatest assistance to them.

- Undecided students with lower high school grades may be in need of particular support in order to progress successfully toward graduation. In the 2010 cohort, there were 102 students who were in both these categories (8.5% of the cohort). These students are not at greater risk of attrition after year 1 than their peers, but they are at significantly greater risk of stalling in freshman status, which is nationally identified as a major risk factor for failure to complete the degree (Adelman, 2006, p. 48).

DETAILED FINDINGS
FIRST-TO-SECOND-YEAR RETENTION

The following variables were analyzed using logistic regression to determine whether they are significantly associated with first-to-second-year retention:

Pre-college variables:

- Gender
- First-generation status
- Residency
- Race/ethnicity
- Low-income status (Pell Grant recipients)[1]
- Date of application for admission
- Undecided major
- High school grade point average
- SAT scores
- Date of application for financial aid
- Financial aid appeal
- Unmet financial need

College variables:

- Fall semester earned credits (16 or more vs. fewer than 16)
- Credit earned for ITW in Year 1 (at KSC or by transfer)
- Credit earned for IQL in Year 1 (at KSC or by transfer)
- Reported as "Student of Concern" at any time during the year[2]

With all variables entering the equation simultaneously[3], three variables were found to be statistically significant and positive predictors of retention at the level of $p < .01$:

- completing ITW in year 1,
- completing IQL in year 1, and
- not being on the Students of Concern list.

By combining all three significant variables (completing ITW; completing IQL; and managing personal, social, academic, and mental health issues so as to stay off the Students of Concern list), students increase their overall probability of being retained to 90%.

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[1] For this study Pell Grants were used as a proxy for low-income status. This is an imperfect substitution, since under some circumstances a student whose family income is moderate or even high may qualify for a Pell Grant – if, for example, there are several students in the family enrolled in college at once. Nevertheless, Pell eligibility was chosen for this study because it is commonly used as a proxy for low-income status in research of this type.

[2] Students of Concern are those who are reported to the Dean of Students for any serious academic, social, behavioral, or mental health issue. This might include failure to attend class for a lengthy period, a serious roommate conflict, reported suicidal ideation, being a victim of an assault, or any other indication of a similarly serious issue that might threaten a student's ability to continue to function successfully at the College.

[3] Not all students submit SAT scores or high school grades, and not all students apply for financial aid, so there are missing data on these variables for many students, which depresses the number of cases that can be considered in the regression analysis. Since these variables were found not to be significant predictors of retention, they were removed from the analysis and the regression was rerun in order to be able to consider the effect of the remaining variables on all students in the cohort.

Table 1 below shows the retention probabilities for each of these significant predictors, with all other independent variables held constant. Table 2 shows the additive value of the best predictor (completion of ITW in year 1) for each of the demographic groups studied in Part 1 of this study.

Table 1
Probability of Retention for Students in Significant Predictor Groups

Variable	Probability of student IN this group being retained	Probability of student NOT in this group being retained	Change in probability of retention associated with being in the group
Complete ITW in Year 1	85.2%	52.8%	32.4%
NOT on Students of Concern List	83.3%	66.3%	17.0%
Complete IQL in Year 1	86.7%	76.5%	10.2%

Table 2
Change in Probability of Retention Due to Completion of ITW in Year 1
for Students in Each Demographic Group

Group	Probability of Being Retained if ITW is Completed in Year 1	Probability of Being Retained if ITW is NOT Completed in Year 1	Change in Probability of Retention Due to ITW Completion
Women	84.1%	50.8%	33.3%
Men	86.6%	55.7%	30.9%
Racial/Ethnic Minorities	83.8%	50.2%	33.6%
White or Race/Ethnicity Unreported*	85.2%	52.9%	32.3%
Not NH Residents	82.6%	48.0%	34.6%
NH Residents	87.9%	58.5%	29.4%
Low-Income (Pell Recipients)	82.7%	48.1%	34.6%
Not Low-Income	86.0%	54.5%	31.5%
First-Generation Student	84.9%	52.2%	32.7%
Not First-Generation	85.4%	53.2%	32.2%

**Note: Part 1 of this report compared racial/ethnic minority students to white students, and those with unreported race/ethnicity were not considered in that original comparison. For the purposes of this report (Part 2), students of unreported race/ethnicity were grouped with white students in order not to depress the number of cases in the analysis. Although the groups are somewhat different, the retention rates are the same.*

Part 1 of this analysis reported five-year data trends suggesting lower retention rates for women, racial/ethnic minorities, non-residents of New Hampshire, low-income students, and first-generation students. As Table 2 demonstrates, students in the demographic groups for which there is a lower overall retention probability derive even greater retention-prediction benefit from completion of ITW in year 1 than do their classmates who are not in these groups.

PROGRESSION OF RETAINED STUDENTS TO SOPHOMORE STATUS

This study next considered whether retained students earned enough credits in their first year of study to progress to sophomore status. Two major national longitudinal studies have found that the number of credits earned in the first year of college is key to eventual graduation. The most recent of these studies, which followed more than 12,000 high school seniors for eight years, found that failure to earn at least 20 credits by the end of the first year of study reduces the likelihood of eventual graduation by a third (Adelman, 2006, p. 48).

To identify predictors of progression in status, the regression analysis was rerun using all the same predictor variables, this time considering only retained students and predicting whether the student returned to KSC in year 2 in sophomore status or higher. Three variables were found to be significantly and positively predictive of progression to sophomore status at the level of $p < .01$. They were

- successfully completing at least 16 credits in the fall semester of year 1,
- high school GPA of 3.00 or higher[4], and
- academic major Decided at entry.

By far the strongest predictor of these three is successfully completing at least 16 credits in the first fall semester. Earning these credits improves the probability of progressing in status by more than 40 percentage points. Table 3 shows the progression-in-status probabilities for each of these significant predictor variables, with all other independent variables held constant. Table 3 also shows the combined risk for students with lower high school grades and having undecided major at entry. Then Table 4 displays the additive value of the best predictor (completion of at least 16 credits in fall semester) for students in each demographic group plus groups based on high school grades and decided major.

Table 3
Probability of Progression to Sophomore Status for Retained Students in Significant Predictor Groups

Variable	Probability of student IN this group progressing to sophomore status	Probability of student NOT in this group progressing to sophomore status	Change in probability of progression in status associated with being in the group
Complete 16 credits in fall of year 1	75.2%	34.7%	40.5%
High school GPA >= 3.00	74.0%	54.7%	19.3%
Decided Major at entry	68.5%	54.7%	13.8%
Undecided Major AND High School GPA < 3.00	50.6%	81.3%*	-30.7%

**Note: The comparison group on this line of the table is students who are Decided at entry and also have high school grades of at least 3.00. Students who have only one of these risk factors are not included in the comparison on this line of the table.*

[4] Both high school GPA and SAT Total score were significantly predictive of progressing to sophomore status. Because of missing data, using both of these variables in the regression equation reduced the number of cases substantially. High school GPA was found to be a stronger predictor than SAT score, and the two variables are highly correlated. Therefore, SAT scores were removed from the equation and high school GPA was retained, to maximize the number of cases included in the final equation.

Table 4
Change in Probability of Progression to Sophomore Status Due to Completion of 16 Credits in Fall of Year 1 for Retained Students in Groups Based on Pre-College Variables

Group	Probability of progressing to sophomore status if 16 credits ARE completed in fall of year 1	Probability of progressing to sophomore status if 16 credits are NOT completed in fall of year 1	Change in probability due to completion of 16 credits in first fall semester
Women	76.0%	35.8%	40.2%
Men	72.6%	31.8%	40.8%
Racial/Ethnic Minorities	73.0%	32.2%	40.8%
White or Race/Ethnicity Unreported*	78.2%	38.6%	39.6%
Not NH Residents	73.3%	32.5%	40.8%
NH Residents	77.6%	37.8%	39.8%
Low-Income (Pell Recipients)	75.0%	34.5%	40.5%
Not Low-Income	75.4%	34.9%	40.4%
First-Generation Student	72.9%	32.0%	40.9%
Not First-Generation	75.3%	34.9%	40.4%
High School GPA<3.00	72.0%	31.1%	40.9%
High School GPA>=3.00	85.9%	51.6%	34.3%
Major Undecided at Entry	72.0%	31.1%	40.9%
Major Decided at Entry	82.2%	44.8%	37.4%
Undecided Major AND HSGPA<3.00	68.6%	27.7%	40.9%
Decided Major AND HSGPA>=3.00	90.3%	61.9%	28.4%

**Note: Part 1 of this report compared racial/ethnic minority students to white students, and those with unreported race/ethnicity were not considered in that original comparison. For the purposes of this report (Part 2), students of unreported race/ethnicity were grouped with white students in order not to depress the number of cases in the analysis. Although the retention rates are the same, the rates of progression are slightly different between the group considered here (white students plus students who are of unreported race/ethnicity) compared to white students alone, who were the subject of the analysis in Part 1.*

Table 4 (above) demonstrates that completing at least 16 credits in the first fall semester improves the likelihood of progression to sophomore status by about 40 percentage points for most demographic groups, and it is particularly valuable for students whose risk is higher due to lower high school grades or being Undecided at entry or both, as compared to their peers who are not in these risk groups. This analysis indicates that it is the behavior of completing 16 credits in the first fall semester rather than the demographic category that is predictive of progressing to sophomore status. However, follow-up analysis found that students in some demographic groups are less likely than their peers to complete 16 credits in fall. The data do not suggest why this might be so. Table 5 shows the pattern of completing 16 credits in fall by demographic groups.

Table 5
Percentage of Students in Each Demographic Group
Who Successfully Complete 16 Credits in Their First Fall Semester

Group	% Who Successfully Complete 16 Credits in Fall*	χ^2	*df*	*p*
Women	63.6%	1.28	1	.258
Men	66.7%			
Racial/Ethnic Minorities	47.1%	9.99	1	.002
White or Race/Ethnicity Unreported	65.9%			
Not NH Residents	67.9%	5.89	1	.015
NH Residents	61.2%			
Low-Income (Pell recipients)	57.6%	9.97	1	.002
Not Low-Income	67.5%			
First-Generation	60.9%	6.39	1	.012
Not First-Generation	67.9%			

**NOTE: Percentage based on all students in the adjusted original cohort.*

REFERENCES

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college.* Washington, D.C.: U.S. Department of Education.

Turrentine, C. (2011). *Predictors of retention and progression toward graduation; Part 1: First-to-second-year retention and progression to sophomore status, five year trends by demographic groups, 2006-2010.* Keene, NH: Keene State College Office of Institutional Research.