

Students' Sense of Belonging: The Development of a Predictive Retention Model

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Abstract: Educational institutions increasingly recognize the role that student belonging plays in retention. Many studies in this area focus on helping students improve a sense of belonging before they matriculate or identifying belonging as a reason for their departure. This study measures students' sense of belonging at key transition points during the first year and finds that social belonging and academic performance are both strong predictors of retention that are not necessarily correlated. These results suggest that a comprehensive, focused outreach protocol that encompasses both social and academic factors could have a positive impact on student persistence.

Keywords: social belonging, retention, predictive measures, higher education

Soon after St. Cloud State University joined AASCU's Reimagining the First Year initiative, which encourages institutions to think and act boldly when promoting the success of new incoming students, we turned our focus to belonging, which we recognized as the foundation for other strategies we planned to implement to improve students' experience. For more than forty years, researchers have recognized the critical role that social and academic integration play in students' decisions to remain in college and persist through to graduation (Tinto, 1975; Tinto, 1993; Tinto, 1997; Berger & Braxton, 1998). Hurtado and Carter's (1997) sense of belonging measure focused on students' attachment to the campus community as a whole while other researchers focused on attachment to various external communities or other university contexts (Hoffman, Richmond, Morrow, & Salomone, 2002; Kember & Leung, 2004; Lee & Davis, 2000). Zea, Reisen, Beil and Kaplan (1997) showed that both academic and social integration experiences impacted student persistence in college. In a study of 512 first-year students, Beil et al. (1999) found that academic and social integration predicted students' institutional commitments, which in turn influenced their persistence in college after three years. Researchers also have identified distinctions in the way that a sense of belonging to a campus community can be promoted for members of different student populations, including first-generation students (Wosley & Shepler, 2011; Stephens, Hamedani, & Destin, 2014) and students of color (Hurtado & Carter, 1997; Steele 1997; Lee & Davis 2000; Lane 2016). More recently, Jorgenson, Farrell, Fudge, and Pritchard (2018) have shown the importance of engaging students in defining what holistic social connectedness looks like on campus. Interventions such as orientation experiences, first-year seminar courses, mentoring, and promoting more intentional engagement with campus activities have all been shown to improve students' sense of belonging, and also their persistence.

The work of Walton and Cohen (2007, 2011), Walton and Yeager (2011), and Yeager *et al.* (2016) demonstrates that it is possible to improve students' sense of belonging before they matriculate,

25%	quartile	3.5
0%	minimum	1.0

The ten questions produce similar results in both the original data from 2014-2015 and in the new Fall 2017 data. From here we needed to establish what belonging category cut-offs might look like for the data that include the new survey questions for Fall 2017 and how all of the questions correlate.

Table 6. 2017 Qualtrics Data: New Academic Belonging Questions plus 10 Social Belonging Questions Selected for New Survey

100%	maximum	5.0
75%	quartile	4.0
50%	median	3.8
25%	quartile	3.4
0%	minimum	1.0

The quartiles in Table 6 for all belonging questions, both social and academic, appear to be close to the quartiles in both the Mapworks and the Qualtrics results of the ten original questions. Further analysis (Figure 4) shows a high positive correlation between the ten original questions and these questions plus the new academic belonging questions, with an adjusted R-squared of 0.855, indicating that the new survey and its resulting index should produce results close to those found from the Mapworks data.

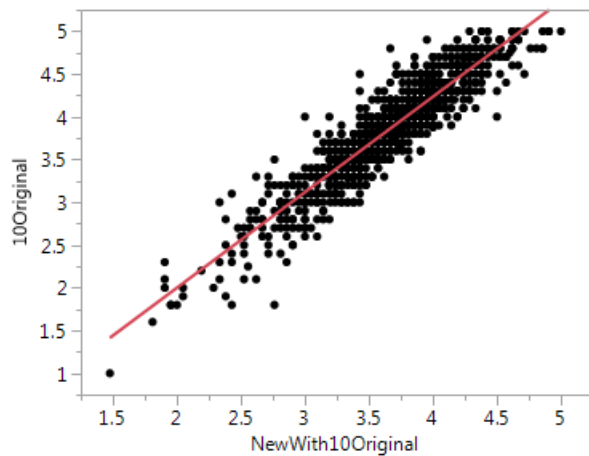


Figure 4. Fall 2017 Qualtrics Survey: 10 Original Questions v. New Questions + 10 original

Results

SBI continues to show the students whose score places them into the Low Belonging category are at much higher risk for non-retention (Table 7). A new finding shows that non-response is also a risk category for non-retention. Except for the No Response category, GPA is similar across groups, which led us to identify what impact students who earned a zero (0) GPA in Term 1 would have on these groups (Table 8).

Table 7. Social Belonging Index

Belonging Level	Number of Students	Fall 2017 GPA	Day 9 Retention
High	151	2.84	99%
Medium	443	2.86	93%
Low	180	2.80	82%
No Response	610	2.44	84%
Total	1384	2.66	88%

Table 8. Social Belonging Index without 0 GPAs

Belonging Level	Number of Students	Fall 2017 GPA	Day 9 Retention
High	150	2.86	99%
Medium	438	2.90	94%
Low	176	2.87	84%
No Response	560	2.65	91%
Total	1322	2.79	92%

While students with a zero GPA in Term 1 were part of each belonging category, they were largely clustered in the No Response category. This leads us to conclude that No Response is a higher risk of immediate drop out, in particular when paired with GPA.

Table 9. Academic Belonging Index

Belonging Level	Number of Students	Fall 2017 GPA	Term 2 Retention
High	153	2.91	97%
Medium	408	2.90	92%
Low	203	2.68	88%
No Response	620	2.44	84%
Total	1384	2.66	88%

According to results shown in Table 9, Low belonging and No Response categories have lower retention for ABI, as was true with SBI. Further analysis was conducted by removing the students whose Term 1 GPA was zero (Table 10). As with the SBI, we see a significant difference in the No Response category once students with a Term 1 zero GPA are removed. Analysis also indicates that SBI and ABI are correlated to each other, but neither is correlated with GPA (Table 11).

Table 10. Academic Belonging Index without 0 GPAs

Belonging Level	Number of Students	Fall 2017 GPA	Term 2 Retention
High	151	2.95	97%
Medium	403	2.94	93%
Low	200	2.72	89%
No Response	570	2.66	91%
Total	1324	2.79	92%

Table 11. Correlations of SBI, ABI and GPA

Correlations	
0.65	SBI with ABI
0.04	SBI with GPA
0.08	ABI with GPA

Since we have been using academic measures such as GPA in our retention models, we decided to compare the academic retention model to actual Term 2 retention in the light of the SBI belonging index categories (Table 12). While overall retention rates are essentially the same, actual retention by SBI belonging category indicates a large discrepancy, which suggests that we have been overlooking a key aspect of why students stay and what factors cause them to make that decision.

Table 12. Academic Retention Model versus Actual Retention

	Predicted Retention	Actual Retention
High	88%	98%
Medium	88%	91%
Low	87%	84%
No Response	86%	83%
Total	87%	88%

The analysis above indicates our current prediction models for retention based on academic measures alone have been missing a key component: a sense of social belonging. We can break this overall theme into four key findings.

Finding #1: There are at least two identifiable categories of at-risk students: academic performance risk and social belonging risk. The academic performance risk can be predicted by the traditional prediction models using Fall GPA and demographics. The present study, however, shows that social belonging risk must also be assessed and included in retention prediction models. This risk appears to be well predicted using the new survey created to measure a student’s Social Belonging Index.

Finding #2: Survey taking behavior is an indicator of retention. Students who do not take the survey are at higher risk for poor academic performance, and therefore Term 2 retention.

Finding #3: The two at-risk groups are stochastically independent. The study results indicate that belonging and academic performance are not correlated and therefore are not predictors of each other. Both must be considered when predicting retention.

Finding #4: ABI and SBI are correlated, but SBI is a better predictor of retention.

Conclusion

The information this survey provides allows us to use predictive measures beyond academic performance to assist first-year students in achieving their goals. A group of students, faculty, staff, and administrators is currently developing a new outreach protocol that takes social belonging into account to complement our existing efforts. Students whose challenges might otherwise have gone unnoticed can now be offered support that is tailored to their specific needs. This work has also

prompted us to identify ways our campus can promote social and academic belonging more broadly, including pedagogy workshops, seminars, and a speaker series. Together, these efforts will continue to shape the way we reimagine the first year of college for our students.

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