

Key Steps for Student Success and Thriving Initiatives: Lessons Learned and Shared

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Abstract: Social responsibility and support for diverse communities figure prominently among the Core Values of Grinnell College. As a result, the college has a long and proud history of student success initiatives. During the past five years, in connection with Grinnell's Quality Initiative associated with an upcoming accreditation review, college staff have intensified both the research and operational activities connected with this work. This paper will focus on both our progress and continuing challenges in three areas: 1) collecting and protecting high-quality data, 2) making meaning from the data and socializing results with the campus community, and 3) moving from data to action through effective interventions in collaboration with others. Included are several high-level conclusions and recommendations as well as an appendix outlining a number of recent initiatives.

Introduction

For the past five years, Grinnell College has been working to develop a deeper understanding of the factors leading to student success in a small (about 1,700 students with nearly 98 percent full-time), private college context and to promote a holistic, integrated approach to student retention and thriving. Among the long-standing core values of this college are social responsibility and support for diverse communities of students, so such efforts have a much longer history than just the past five years. However, the most recent focus on student success initiatives has been catalyzed by a combination of benchmark data from peer colleges as well as an upcoming accreditation review. For the most selective U.S. liberal arts colleges, six-year graduation rates frequently range from 85 to 95 percent illustrative of the way in which a rigorous admissions process, coupled with a devoted faculty and an engaging intellectual, co-curricular, and residential setting, can help promote excellent rates of retention and degree completion (U.S. News & World Report, 2017). In 2013 it was noted that Grinnell traditionally performs within, but at the lower end of this range, thus the interest in a period of focused research coupled with some new intervention initiatives. This work became the basis for Grinnell's Quality Initiative (Higher Learning Commission, 2018) within its ten-year accreditation cycle.

In the past year, Grinnell achieved its best first-year retention rate in the past quarter century and one of the four best four-year graduation rates in that same time period. However, given the many new studies and initiatives we have undertaken recently (see appendix), it is not clear which have had the greatest impact. What is clear though is that our work during this period can be categorized in three areas: 1) collecting and protecting high-quality data, 2) making meaning from the data and socializing the results with the campus community, and 3) moving from data to action through a wide variety of interventions in collaboration with others. In this paper we describe the results of the collaborative, evidence-based, and multi-pronged approach we have taken to student success and thriving, including the continuing challenges we have identified. While we recognize that institutional context matters greatly in measures

like persistence and completion rates, we believe that the steps we have taken in this work and the lessons we have learned are relevant for other colleges and universities as well.

Student Success as Persistence, Completion

We begin with a brief discussion of our evolving thinking about the meaning of “student success.” While persistence and completion rates are important and easily measured outcomes for colleges and universities, these statistics are strongly related to the institutional mission and resources, the demographics of the student body, and the lives and motivations of both the students and the faculty. For example, small, private, and selective colleges like Grinnell (acceptance rates were 25 percent and 20 percent in Fall 2015 and 2016, respectively) are well-known for providing supportive, “high-touch,” environments in which students enjoy small classes, inquiry-led pedagogy, and high-impact educational practices.

Grinnell College is fortunate to have sufficient resources so that it can operate as need-blind in its admissions practices and is able to meet the full demonstrated need of all of its students. As a result, while financial drivers of attrition sometimes come into play, they are less likely than at many other colleges and universities. Also, as a highly-selective school, nearly all of Grinnell’s students have especially strong academic backgrounds. Year after year, we have observed that the majority (about 60 percent) of our attrition is among students with grade point averages above 3.0 and about half of those have grade point averages above 3.5; often it is not a lack of preparation for college or academic performance in college that are among the primary underlying causes for withdrawals in this context.

During the past five years, we have begun thinking about attrition as a “syndrome” shaped by multiple connected and correlated factors (Figure 1). The academic and financial demands on our students are not irrelevant regarding persistence and completion but in addition, we have seen the need to explore in some depth a number of additional social and psychological factors. These have included mental health issues, substance use and abuse, the college location and its distance from home for many students, and the social climate of the campus. Also, even for some high-achieving students, the rigor of the academic program and their performance relative to peers can be an important factor in attrition.

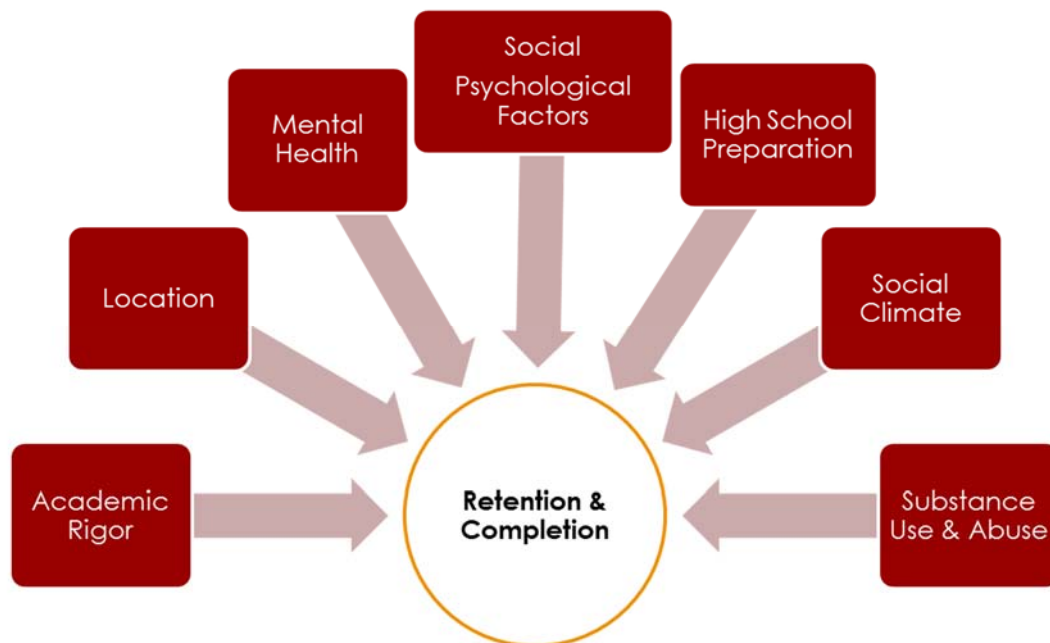


Figure 1. Seeing attrition as a syndrome

Student Success as Thriving

Thriving in college has been defined as being “fully engaged intellectually, socially, and emotionally in the college experience.” (Schreiner, 2013, p. 41). It can be measured by the Thriving Quotient, which only measures malleable and mutable domains of thriving, such that individuals who score low can participate in efforts to move them to a higher level of thriving. Given the practical nature of operationalizing results from the Thriving Quotient, we are planning to administer this measure across campus and work with campus partners to implement programming as appropriate, based on the results.

As part of our appreciation of the concept of thriving, we have also invested substantial effort in developing an understanding of the factors that facilitate student success, based on what students say has made them academically successful. These narratives and aggregated experiences have been influential in, and beneficial to, the work both of faculty and student affairs professionals. And, in pursuit of helping students thrive, we have used a combination of quantitative data, predictive analytics, and qualitative methods to increase our efforts to identify those students who are especially challenged with regard to thriving, in an effort to determine which interventions are most likely to provide them with the support they need.

We recognize that we are not alone in reframing our definition of, and thinking about, student success. For several years, the Higher Learning Commission (HLC) has been providing support for student success initiatives through its Persistence and Completion Academy. Recently, a decision has been made to restructure that program with a focus on the multifaceted nature of student success, and the many stakeholders involved in supporting the broadest sense of what it means for students to be ‘successful’ in college (Quintero, 2018).

We also recognize that context and culture vary widely among colleges and universities and, as noted earlier, this variability no doubt plays a substantial role in student success outcomes. In any case, we have concluded that while challenging, a broad, holistic approach to both our research and operational activities that is now focused on both attrition and thriving has been especially effective.

Accreditation as a Catalyst for the Work of the Past Five Years

In addition to establishing a framework for thought about student success, it is also important to develop a strategy for gaining campus-wide support for the work. In Grinnell’s case, an upcoming accreditation review provided both an incentive and a helpful structure. During the summer of 2014 President Raynard Kington established and charged the Student Success and Accreditation Task Force with the stewardship of the College’s Assurance Review and Quality Initiative processes toward the goal of maintaining our accreditation relationship with the HLC. For the Quality Initiative (QI), which involves the selection of “one major improvement project that meets its current needs or aspirations,” the Task Force developed a plan to promote our understanding of and support for student success and retention at Grinnell College. Our 2014 QI proposal for HLC stated the following:

“Grinnell College will undertake a systematic analysis of student success and persistence to completion of the baccalaureate degree. Beginning with an examination of the current and historical 4-year and 6-year graduation rates, we expect to improve our methodology of tracking student success in real time, using aggregate data to model features of student success, to examine these features to understand student behavior, and to enhance those support services that promote student success.”

The accreditation process is important for every college and university for a variety of reasons but most important is the fact that it provides an opportunity for reflection on, and improvement in the institutional mission. What remains in this paper then are the steps we have taken and the lessons we have learned in the three key areas of our work described in the abstract.

Collecting and Protecting High-Quality Data

The authors of this paper work in an office charged with providing analytic support and institutional research (IR) services for the college. Thomas Davenport, Jeanne Harris, and Robert Morison (2010, p.7) have noted that the questions addressed by analytics can be organized across two dimensions: time frame (past, present, and future) and innovation (known information or gaining new insights). During the past five years we have redoubled our efforts to collect and report on data from the past, to develop new, near-real-time alerts, and to explore the potential for predictive modeling. They also note that “You can’t be analytical without quality data, and you can’t be really good at analytics without really good data.” (Davenport et al., 2010, p. 23).

Data Inventory

In the fall of 2013 and in support of one of the elements of Grinnell’s strategic plan (to develop a culture of continuous planning and evidence-based decision-making), a Data Stewards Working Group was established and was tasked with developing a shared understanding of what is meant by “good data,” (see Pipino, et al, 2002) developing an inventory of institutional data specifically for the college’s Core Metrics shared with trustees at each Board Meeting, and ensuring that there are clear definitions and quality standards for the relevant data and information elements in those metrics. Membership in the cross-functional group was drawn from those who routinely work with and/or provide raw data for the operational data store. Meetings were held monthly during the initial definition of the Core Metrics and then on an ad hoc basis once the confidence was gained in the various elements and procedures of data governance. Since the beginning of that effort, a high priority has been established within IT Services at Grinnell on cybersecurity through a combination of staff additions and focused projects.

This is very challenging work in the absence of a data warehouse and well-established data governance processes. While Grinnell is a small campus, it is resourced with many disparate data systems resulting in a number of “data silo” issues. We have made some progress with the quality of data for our primary institutional effectiveness metrics but continue to rely heavily on personal connections and checking by those who have worked with the data for a long time. Considerable progress has been made regarding data security with the addition of new specialists within IT Services. The growth of the data security team within ITS has provided the campus community with much-needed expertise in data security matters, and will continue to be an integral part of our work with the upcoming implementation of the general data protection regulation (GDPR) (Nassirian, 2017).

Data Collection and Analytics

Like other college and universities, Grinnell College has for a long time relied on human-intelligence networks made up of faculty, professional advisors, administrators and staff, and the students themselves to collect and share data for the purpose of establishing both a challenging and supportive learning environment. One of the arguments for small, residential, and well-resourced campuses is that staff to student ratios are high so such data sharing increases the odds of student success. Several examples of this human intelligence sharing are contained in the appendix to this paper including but not limited to Academic Performance Ratings; Mid-Term Assessments; the work of Careers, Life, and Service advisors; and micro-survey data.

Meanwhile, there is ongoing interest and research in higher education regarding the potential for data mining and machine learning to provide new and helpful early alerts and predictive models, exemplified by the work of the Society for Learning Analytics Research (SOLAR). Charles Lang, et al., have dedicated the entire first chapter of a 2017 handbook to a discussion of how learning analytics are “a bigger incarnation of a shift to an algorithmically pervaded society, and their wider impact on education needs careful consideration.” (Lang, et.al., 2017, p. 17). We have anticipated and written about a future where there will be an integration or blending of human intelligence networks with learning analytics (Stiles & Wilcox, 2016). Such a future has also been described by Thomas Davenport and Julia Kirby as an example of “augmentation.”

Augmentation means starting with what minds and machines do individually today and figuring out how that work could be deepened rather than diminished by a collaboration between the two. The intent is never to have less work for those expensive, high-maintenance humans. It is always to allow them to do more valuable work. (Davenport & Kirby, 2016, p. 63).

To test the potential for new analytics techniques in the Grinnell College environment, we contracted with a commercial provider of predictive modeling for three years. While the results were promising, especially as one of the few ways we might identify high-performing students at risk of leaving the college, we also identified some special challenges we are now addressing through our own continuing work. First, because Grinnell is a small (about 1,700 students) and selective college, our persistence and completion rates are relatively high so we are frequently confronted with the “small n ” problem in any test for statistical significance in the non-persisting subpopulations of the student body. Second, throughout the period of our predictive modeling work, we had only infrequent initial condition data (student data upon entry to the college) and once-per semester student information system data such as grades and credit accumulation. The paucity of time-series data proved to be problematic. Third and as noted earlier, the majority of attrition at Grinnell is among students who are not in academic trouble so it became clear that features over and above those from the student information system including social and psychological data would be important in a predictive model. We continue to conduct research with regard to both the data frequency challenge and that of identifying important social and psychological variables. Finally, as we envision a day when we might have a wealth of personally identifiable data at hand and a robust predictive model, we are confronted with the issues of privacy and intervention “science.” How might we make acceptable and socialize such a model with students and the faculty? How would we use the probabilistic results of such a model to develop effective interventions, especially for our high-achieving students? Having identified these challenges, our current efforts focus on enhancing our human-intelligence networks, our use of analytical tools, and the synergies we are finding at their intersection.

In addition to the models focused on standard measures of students’ success, we are also engaged in helping our students in a holistic way by supporting mental wellness on campus. To that end, researchers from the RAND Corporation have partnered with Grinnell College to develop, implement, and analyze the results of a large scale mental health survey. This survey covers nine key areas related to mental health and wellness: 1) depression, anxiety, and their impact on academics, 2) alcohol and other drug use, 3) experiences with counseling and/or mental health services, 4) information availability and usefulness for students, 5) perceptions of those with mental health concerns, 6) campus mental health climate, 7) the importance of social networks, 8) mental health literacy, and 9) key demographics. This wide-ranging survey has been instrumental in helping the campus understand the nuances, severity, and range of mental wellness-related issues the students face (Wilcox, Dossani, Ng, & Graf, 2018). With these data in hand we have engaged in conversations with key campus constituencies, helped to inform staffing in the student counseling center, and are developing a pilot program, which if effective may improve the mental health service model currently in use. In addition to the data itself, the partnership with RAND Corporation has been valuable in lending research expertise to an area where so many institutions struggle to make effective change.

Making Meaning From the Data and Socializing the Results With the Campus Community

Understanding the Data Through Narrative

Student success and retention research has largely been quantitatively conducted. We have argued elsewhere in-depth about the importance of qualitative data for understanding student motivations and the student experience (Robinson, Wilcox, & Stiles, 2017). To summarize, however, IR offices are replete with skilled quantitative analysts and statisticians. Working with large datasets that could include tens of

thousands of students, IR work has to be predominantly quantitative in nature and generalizable to be helpful for decision makers. However, while patterns and statistical significance can be seen from such data, they provide limited assurance that the users of the data—those making decisions based on the data—fully understand the reasons the data are as they are. Effectively, we cannot claim to know what the data mean or how to interpret it appropriately without some additional background or context.

At Grinnell, we obtain that context and background through collecting and analyzing sizeable amounts of qualitative data, gathered mostly through individual in-depth interviews. The narratives that we hear then inform and expand our understanding of any number of issues that we also study quantitatively. Hearing from students about a topic in sufficient depth and breadth allows us to arrive at themes pertaining to the topic. These themes emerge as plausible explanations for particular data patterns. We can understand student motivations for particular behaviors or responses to surveys, and we can then have greater confidence in talking with practitioners and administrators seeking to rectify or ameliorate specific problems within the institution.

At this point, an example of how interview data help us understand quantitative survey data may be informative. In a recent survey conducted at the start of the second semester, we asked students about their belongingness in their major department and whether they had at least one faculty member within their department with whom they felt they had established a strong relationship. As expected, the vast majority of respondents indicated that they have a strong sense of belonging in their major department and had at least one good faculty relationship. Those who answered otherwise were intriguing to us. We wondered what it was about the student that made their experience apparently somewhat isolated in their major, when the institution strives to provide small classes, close contact with faculty, and a strong sense of community on campus. In the course of over 40 interviews with fourth year students—including those who had indicated limited belongingness or faculty relationships—we came to recognize the limitations in our assumptions around students reporting these sentiments. Each had a particular set of circumstances for feeling as they did. Some were in a reasonably large major that was a hybrid of two other departments, with faculty from these other two departments. These students often felt they had nothing to which to belong, since they were neither department A or B, but were major AB. Thus, although some felt that they were part of a community, their belongingness was limited. In another case, students in a very small department had arrived on campus right after the departure of one of the few tenured/tenure-stream faculty in the department. Therefore, visiting professors were a substantial part of their major faculty in their first and second year. Following time abroad, they finally got to know the new tenure-line faculty member. However, due to their limited exposure to this faculty member, the relatively high turnover in this small department, time studying abroad, and the fact that they were only half way through the year of the new professor's appointment, these students felt they had not had a chance to develop a strong relationship with faculty in the department.

In this example, there were systemic causes for limited belongingness or faculty relationships that had little to do with the individual students. We also learned to question our assumptions about the necessity of belongingness and faculty relationships, despite the large body of literature that suggests they are vital for student success. Some students who identified as strong introverts remarked that they had no faculty relationships other than a transactional interaction with their advisor each semester to sign up for next semester's courses. They were very content with this state of affairs, and would have been uncomfortable with a stronger relationship.

Communicating Results Throughout the Campus Community

Another benefit of qualitative data is that it can be more accessible to a wide array of individuals. Narrative, or story-telling, is part of the human experience and how we make sense of the world (Weick, 1995). Decision-makers around campus, therefore, are often able to grasp data findings more intuitively, when the findings are in the form of narrative—a quotation from a study participant.

When we present data in the form of stories or quotations around campus, we receive two common reactions. First is the nodding of heads; the audience, whether faculty, student affairs professionals, or staff in a range of other offices, recognize the face validity of the findings. The stories

mesh with experiences they have heard students recount. After the initial nodding of heads often then comes some form of cognitive push-back, commonly phrased as, “You are presenting things we already know.” Faculty and staff are thus surprised when we express delight in their recognition of the themes, glad to hear the data have face validity. This interaction allows us the opportunity to point out that we are providing empirical data that support the lived experience of either audience members or students with whom the audience member has interacted. In a culture of data-informed decision making, having empirical data around an issue is vital for the institution to direct resources to addressing a problem. A third, less common reaction is to discuss the limited generalizability of the results. We use this opportunity to discuss the fact that transferability, rather than generalizability, is more appropriate for qualitative research methods and epistemologies (Rallis & Lawrence, 2017). Then, we discuss the cyclical nature of qualitative and quantitative work, where qualitative investigation can derive new hypotheses that can be quantitatively queried, and puzzling quantitative findings can be more fully explained through qualitative work.

The ability to reach a greater proportion of the campus constituents with more readily comprehensible findings has strengthened the office’s relationships with faculty and staff around the institution. Our campus colleagues know that we, as a research group, can and will approach research questions with epistemological and methodological breadth, are able and willing to use methods best suited to the question, and often adopt a multi-methods approach, where we conduct complementary quantitative and qualitative studies around a single issue.

Moving From Data to Action

Grinnell’s Quality Initiative that was described earlier in this paper included multiple, connected elements of research and operational activities. Fifteen individual programs are briefly summarized in the appendix. In considering the most effective ways to communicate data and information, we have recognized that providing data itself does not move people to act on issues at hand. The role of an institutional research office, or other groups providing data, then, is not only to provide those data, but to provide information—that is, data in context—for others. Many who are unfamiliar with the research methods utilized appreciate an objective but clear framing of the information, and in any case, the data itself does not exist in a vacuum but only in a larger context, which must also be included in interpretation.

This fact has perhaps become particularly salient in the description of the mental health challenges our students face as revealed in the large scale mental health survey described earlier. Reporting this information through risk ratios, severity measures, and probabilities failed to communicate the urgency of the issue at hand, and the actual challenge the institution faced in meeting the students’ needs. When we extrapolated the information to indicate the number of students who were faced with a specific challenge, it was clear to all listening that the issues were impacting more than just a handful of students with pre-existing conditions. The same holds true for explaining the risk of attrition; where probabilities often fail to communicate the message a simple color code (red, yellow, green) or narrative based indicator (satisfactory, marginal, risk of failing) were more appropriate for gaining traction on critical issues. This is not to say that presentation of the complex survey methods or analysis is unimportant, but only that the information is much more actionable when presented in full context and in a way that demonstrates the tangible results to key stakeholders.

While the results of the mental health survey proved to be problematic in generating action, the finish line project (outlined in the appendix) has produced ongoing and effective outcomes. The origin of this project was in the development of three scatter plots showing a predictor variable (first semester GPA) on the horizontal axis and an outcome variable (current GPA) on the vertical axis. The first plot showed results for students in a given cohort who had completed their degree within four years. The second plot showed the same for students who had withdrawn from the college. The third highlighted those students who had neither completed nor withdrawn, i.e., those who still had a possibility of crossing

the “finish line.” After several years of activity, the following new actions and policies have evolved: 1) an increased willingness to accept transfer credits from other institutions of courses that do not have equivalent courses at Grinnell, 2) an increased number of course withdrawals, in lieu of failure and in response to revised and much more proactive academic advising, and 3) a move away from first-year suspensions and toward newly established programs and classes that aim to support academically struggling students.

Another example of moving from data to action has been our work on grade dynamics which is managed largely by the staff in our Office of Analytic Support and Institutional Research. At the end of each semester, the difference between current semester GPA and cumulative GPA for all students is determined. The cases of particularly large negative changes are shared with the academic advising staff to ensure that no one who might need assistance is missed. Students who have demonstrated a large positive change in GPA, especially from less than average performance at the college, receive a congratulatory note from the president. These cases of improved academic success have also been the subject of an in-depth qualitative research study.

So, in the end, engaging successfully in data-informed initiatives across campus is dependent on the ability of the researcher(s) and staff to communicate the importance, nuances, and impact of the data and information. We have seen and experienced the limits associated with sharing just quantitative data. Projects that have involved a multi-methods approach, often from an iterative research cycle on a set of similar or related questions, have proven to be most helpful in establishing face validity for a variety of audiences and in producing action. In cases where a quantitative analysis alone may be especially counter to the culture, the contribution of qualitative work can be transformative.

Conclusion

One only needs to read the popular press at the beginning of the academic year or to review the growing number of college rating and ranking systems to see that undergraduate retention and completion rates are clearly the subject of national interest; questions of cost, value, and accountability abound within these systems. As we have noted in this paper, there is evolving thinking and increasing complexity in notions of student success. We would encourage those who develop and drive campus policy and initiatives related to student success to consider the multiple and broadly-defined elements of ‘success’ and thriving. The quality assurance and improvement programs associated with regional accreditation might be used to create an opportunity for broad campus involvement in the work of understanding and enabling student success and thriving.

We recommend that new initiatives should be informed by empirical information, both quantitative and qualitative, and designed to assist the academic affairs and student affairs constituencies simultaneously. The coordination of information sharing among stakeholders, although complex and challenging, is essential for the support of student thriving. We need to continue to press for the integration of data and information from our human intelligence networks with results from analytics work. Of course, ensuring data quality is “job one” in any research effort but this is no simple task, especially in those cases where data warehousing and data governance processes are not well-developed. Those involved in data collection, protection, and meaning-making must continue to press for these critical elements of infrastructure and support services.

Concerns around mental health are growing nationally as is the desire to better understand students with mental illness and to support them during their time in college. To do this, data sharing and coordinated research in alternative models of support may be helpful. In addition, how we frame students’ struggles as mental health or mental ‘hurt’ is of primary importance. An increased focus on mental wellness, service delivery models and other social and psychological factors should be considered as they relate to the holistic notion of student success.

Finally and as we have noted in the appendix where we outline a large number of relatively new initiatives on our campus, we recommend that program assessment strategies and tools should be

considered early on in the development of those initiatives. At present, even though we have recently achieved some of the best persistence and completion rates in the recent history of the college, we only have a rough sense of the relative effectiveness of many of these various programs. Our mission statement at Grinnell is quite explicit in expressing our intent to support students all the way through degree completion; this critically important work is understood to be everybody's business on our campus.

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Appendix

In the following we provide brief descriptions of fifteen initiatives undertaken at Grinnell during the past five years; this list demonstrates our efforts in moving from data to action and in engaging the whole campus community in this work. However, we do not intend to imply that a focus on student success is a new idea at this college; rather, what is perhaps new is the degree to which our research efforts are informing practice as well as the breadth and coordination of the work as a result of the campus-wide focus on our Quality Initiative. It is too early in some of these initiatives to rate the relative effectiveness of the fifteen actions described below. Our work has been focused thus far on implementing these initiatives and working with the data. A system-wide assessment of these activities in the future will help determine the effectiveness of each in relation to the other and within the context of Grinnell College.

The Predictive Modeling Project. This was a three-year project conducted in partnership with a commercial provider of predictive modeling services in higher education. The predictive model provided insights from two perspectives: “students” and “courses.” The “students” perspective yields data on the probability of persistence based on a wide variety of student characteristics. The “courses” perspective provides data regarding how a student’s course grade influences persistence and graduation, which courses offer the greatest probability of increasing graduation rates, and the courses in which students are most challenged. These predictive modeling results are one of the only sources of alerts at Grinnell for attrition among students with GPAs above 3.0—the majority of those students who leave the college prematurely.

- *Data sources: Sources were largely from Grinnell’s Colleague Student Information System but also included selected admission and financial aid data. The vendor was able to include some national census data based on the home of record for students. It important to note that social-psychological data were thought to be especially important but were not included in the analysis during the trial period. College staff are using such data in ongoing on-campus work now.*
- *Data usage: Predictive modeling outcomes were reviewed and used by Institutional Research staff to evaluate the model and to share with Student Affairs staff in conversations about potential use of such techniques in the future. Model outcomes were not shared with students at any time during the trial period due to the probabilistic nature of the results and the fact that no there had been no IRB review or approval of results-sharing.*
- *Impact on student success outcomes: This experiment helped the IR staff and others on campus understand both the potential and limitations of predictive modeling in the Grinnell College context; these results have informed ongoing modeling work by college staff.*

Attrition Trajectories. Once-per-semester graphs of attrition trajectories for each student cohort have proved to be an especially useful way of informing the campus about student persistence data. These graphs include upper and lower limits, i.e., the best and worst cases during the past fifteen years of experience at the college. Attrition statistics account not only for students who have withdrawn, but also those who are suspended and on leave. Therefore, these graphs provide a helpful visual image of the uncertainty associated with students in the latter two categories.

- *Data sources: Sources are student status codes (leave, suspended, or withdrawn) at the time of fall and spring censuses each year.*
- *Data usage: Attrition trajectory graphs have been developed and shared with college leadership each semester.*
- *Impact on student success outcomes: These graphs provide early and quite tangible indicators of the results of ongoing student persistence and completion initiatives. They have helped college staff visualize overall cohort performance as well as the timing of attrition, e.g. about 40 percent and 30 percent on the average for a given cohort’s attrition in the first two years, respectively.*

Grade Dynamics Analysis. Sharing data on the difference between the most recent semester GPA performance and prior cumulative GPA has also proved to be especially helpful. By visualizing the most extreme cases of decline or improvement, we have been able to: 1) ensure that no cases of decline go unnoticed by academic advisors, and 2) recognize and congratulate through a note from the president those cases of dramatic improvement.

- *Data sources: The source is term-based GPAs.*
- *Data usage: Those cases with the most dramatic changes are identified by IR staff. For declines, results are passed along for a review by the Student Advising staff to ensure that no such cases are missed. Cases of dramatic improvement, especially from relatively poor academic performance, have served at the basis for notes from the President as described above as well as targets for qualitative research.*
- *Impact on student success outcomes: This work provides a check on ongoing Student Advising work to ensure that no student “falls through the crack.” Each semester, the President receives some positive and appreciative responses from students regarding his notes. Grade dynamics data have also been identified as an important feature in any predictive modeling work going forward.*

The Finish Line Project. Early on in our student success work, we recognized that it would be beneficial to focus special attention on those students who had not completed after four years of study and who were also not in a withdrawn status. Graphics highlighting these cases led to the development of the “finish line project,” now led by the registrar’s office and designed to provide carefully considered follow-up with these students.

- *Data sources: The source is status codes (leave, suspended, or withdrawn) for each cohort at the end of each semester.*
- *Data usage: This project began with three scatter plots shared with the President and the Dean: first-semester GPA on the x-axis as a predictor, and current semester GPA on the vertical axis with: 1) a plot for those who completed in four years or less, 2) a plot for those students who had withdrawn, and 3) a plot for those who were still active but not completed, on leave, or suspended.*
- *Impact on student success outcomes: The scatter plots described above triggered more aggressive and systematic action to stay in touch with those students identified in the third plot described above; the “Finish Line Team” was created and has continued its work since.*

Qualitative Research through In-Depth Interviews. As described earlier in this paper, the addition of in-depth qualitative research, mostly through individual interviews, to our Analytic Support and Institutional Research team has contributed greatly to our work on student success and thriving.

- *Data sources: Individual interviews with relevant members of the campus community for a given research question (most often these are students, but may include people in other roles).*
- *Data usage: Narratives are aggregated and analyzed for saturated themes. These themes are shared as findings, illustrated with quotes, with the relevant campus constituents to inform their understanding of student motivations and perceptions.*
- *Impact on student success outcomes: Qualitative findings have changed practice in a variety of domains within Grinnell College, including: new student orientation, faculty advising and teaching, admissions, Title IX, academic support, and residential life.*

Learning from Leaving. Exit interviews allow the college to understand more fully the factors influencing students to depart prior to graduation. With the arrival of an experienced qualitative researcher in the fall of 2016, the exit interview process and format changed for a period of time. Where previously, interviews were structured, with data recorded by the interviewer into an electronic file during the interview, a new, temporary process wherein interviews were semi-structured, audio-recorded, transcribed verbatim, and coded in depth inductively was developed. The purpose of this change was to allow factors that may not

have been covered in the structured format to emerge in the more loosely structured interviews, which prompt the interviewee to take the lead in describing the factors contributing to their departure.

- *Data sources: Interviews with students who are voluntarily leaving.*
- *Data usage: Findings have been shared with relevant leaders in various campus domains.*
- *Impact on student success outcomes: With the many and varied reasons for premature departure from Grinnell College, the findings have influenced practice in multiple domains (as above, with qualitative research), or confirmed the need for change in some areas.*

Micro-Survey Data. Given the challenges noted in this paper with data frequency, we are in the early stages of testing a micro-survey strategy. Six weeks into the fall semester of the past academic year, we asked students a single question: “In general, how is it going?” We received a response rate of 69 percent overall and 82 percent for the first year students. We are now following up with the analysis to determine the predictive power of these data.

- *Data sources: Data were collected via an online survey with the use of an email embedded response option. All active students at the college were invited to participate in this pilot.*
- *Data usage: We are currently evaluating the additive predictive power of this single question in models currently used to estimate probability of individual student attrition. In addition, we are evaluating this survey as a proxy for a combination of other variables. In this sense, if it does not provide additional predictive power, we may see utility in using it as a simple and easy to gather proxy for other, more difficult to combine data points.*
- *Impact on student success outcomes: The pilot survey had a successful implementation. A group of stakeholders will be meeting in the coming year to review the results of analysis and determine if it would be beneficial to repeat the survey.*

Real-Time Data in First Year (Mid-Term Assessments [MTAs] and Academic Performance Reports [APRs]). MTAs and APRs are examples of the use of “human intelligence” with regard to new and earlier alerts regarding student academic performance at Grinnell. For all first year students, faculty provide a rating of “S” for solid performance, “M” for marginal performance, and “R” for risk of failure. This initiative has been an important step forward for the college in moving to additional, near-real-time data for both students and advisors.

- *Data sources: Sources are ratings by faculty at each mid-semester for first and second-year students, now with 100 percent faculty participation.*
- *Data usage: Results are shared with Student Advising staff and the students themselves.*
- *Impact on student success outcomes: This is an example of “human intelligence,” i.e., a near-real-time faculty assessment of the likely academic outcome for all first and second-year students. Analysis of results show the low levels of false positive and false negatives in these data. In 2016, only 5 percent of students with an S MTA received a final grade of C+ or below (false negative) while 14 percent of students with an R rating received a final grade of B- or better (false positive). Grinnell faculty were reluctant to give mid-term grades so as not to discourage the students. IR staff have found the MTA data to be somewhat useful in modeling though lacking in granularity.*

Partners in Education. The Partners in Education (PiE) project is now in its third year and gives strong evidence of positive effect on targeted students. Students in the bottom decile of GPA in their first semester are invited to participate; those who choose to do so attend a weekend retreat prior to the spring semester, where a strong group spirit is developed along with honest reflection on work patterns and behaviors that led to below-average performance. As in past years, this retreat is then followed by active mentoring by post-baccalaureate fellows and a team of faculty “senior mentors.” A designated study room provides resources and drop-in support as well for study skills, time management, and general accountability. (Lopatto, 2017).

- *Data sources: The source is first semester GPA for those students in the bottom decile.*

- *Data usage: Students who have performed in the bottom decile in their first semester are invited to participate in this program. This retreat is then followed by active mentoring by two post-baccalaureate fellows and a team of “senior mentors.”*
- *Impact on student success outcomes: The second PiE cohort (a group of eleven) saw sizeable increases in GPA. Each student’s GPA increased from fall to spring, and the averages increased from 1.91 to 2.50, roughly twice the increase experienced by students who were invited but did not participate. Retention from first year to second year for PiE participants has been 95 percent over the past two years.*

HHMI Second-Year Retreat. The Howard Hughes Medical Institute (HHMI) second-year retreat is a grant-funded activity for second-year students interested in the sciences. It was held for the fourth time last fall. As in prior years, student evaluations of the event ranked very highly, with 96 percent of students recommending the event to others. Although the grant period is ending, the college has added a budget line to continue to support this event. (Lopatto, 2017).

- *Data sources: The source is students in their second year expressing an interest in the sciences.*
- *Data usage:*
- *Impact on student success outcomes: The impact on performance in two challenging science courses (Molecules, Cells, and Organisms (BIO 251) and Organic Chemistry (CHEM 221) have been documented..*

Academic Success Seminar. In spring semesters since 2014, first-year students who were in the lowest decile GPA were invited to participate in either Academic Seminar or the Partners in Education Program (PiE). Academic Seminar is a five-week, hour-long workshop series focused on academic and self-management skills. Because PiE demonstrated better engagement and GPA outcomes, the content for Seminar is now incorporated into PiE. (Lopatto, 2017).

- *Data sources: The source is first-semester GPA for those students in the bottom decile.*
- *Data usage: Students not electing the PiE program described above were given the option of participating in the Academic Success Seminar.*
- *Impact on student success outcomes: The content of this program has now been incorporated into the PiE program.*

CLS Advisors. In 2016-17, the Center for Careers, Life, and Service (CLS) invited every first-year student to connect with a CLS Adviser through at least two interactions with the goals to (1) acquaint every first-year student with the staff, programs, and services of the CLS; (2) foster an advising relationship between every first-year student and a member of the CLS advising team; and (3) introduce students to the concept of making intentional decisions based on their personal values throughout their time at Grinnell to assist in their professional, personal, and civic development. (Lopatto, 2017).

- *Data sources: Sources are records of student interactions with CLS staff and programming.*
- *Data usage: New trend data regarding advising engagement have been developed and widely shared.*
- *Impact on student success outcomes: CLS appointments with unique students were increased by 384 percent from fall 2013 (Class of 2017) to fall 2016 (Class of 2020). Also, CLS advisers collaborated with 21 of 35 Tutorial (a required course for first-year students) faculty advisers to plan 25 in-class sessions to benefit tutees; many sessions included an intersection between CLS-related topics and course content.*

Belongingness. The Belonging Study seeks to model an intervention after Walton and Cohen’s (2011) study to investigate whether there are specific, mutable psychological phenomena impacting the academic performance of Grinnell students who are members of socially stigmatized groups. That is, we wanted to know if the positive academic gains achieved by students of color at other institutions can be replicated at

Grinnell. Next steps include analysis of existing data, now that outcome measures, including fall term GPA, are available for the study participants.

- *Data sources: Students were asked to participate in an online, video, and writing-based intervention focused on why they think students might feel initially unsure about whether they fit in but ultimately overcome these fears. Data regarding participation in the intervention was combined with existing college data sources including; term grades, credit accumulation, and student status.*
- *Data usage: In order to estimate the impact of the intervention (treatment) on academic outcomes defined as mid-term assessment, 1st semester grade point average (GPA), and persistence we employ a treatment effects model (Angrist, 1998; Rubin, 1974, 2006). This type of model is commonly used to estimate the counterfactual or 'alternative universe' scenario.*
- *Impact on student success outcomes: The primary impact of the intervention, as measured by first-year student participants' fall Midterm Assessment and by first-semester GPA, is small and, in all but two cases, insignificant. This indicates that the intervention had little to no impact on students' initial academic outcomes in college. This result is counter to what was predicted in the research literature on which our intervention was based.*

Advising Week. In the Second Grinnell Year program, seven events introduce resources and provide information about the opportunities and challenges of the second year, and support for choosing a major. (Lopatto, 2017).

- *Data sources: The source was evaluation data regarding the Fall 2015 Advising Week program.*
- *Data usage: These data were used to identify the seven most effective components of earlier programs.*
- *Impact on student success outcomes: Specific outcomes are unclear but the evolution of this program is now being informed by regular student feedback.*

Conferences on Student Success and Thriving. Since 2015, Grinnell has hosted an annual spring conference on student success and thriving. To-date these conferences have attracted the participation of faculty and staff from more than fifty colleges and universities. Conference summary papers have been presented at the National Symposium on Student Retention for the past three years as noted in the references. (Latham, M., Stiles, & Wilcox, 2015, 2016; Wilcox, & Stiles, 2017). Information on the most recent conference, which was on the theme of “*Purposeful lives and meaningful work: Thriving after college*” is available online (Grinnell College, 2018).

- *Data sources: Sources include data and information sharing among participating institutions.*
- *Data usage: These conferences have served as a way for faculty and staff to make connections with others with similar interests and challenges regarding student persistence and completion.*
- *Impact on student success outcomes: Grinnell College faculty and staff have benefited from the ideas and contacts made at these conferences. They have also served as a way to motivate and involve a broad cross-section of the campus in ongoing student success and thriving work.*