Understanding Student Motivations to Inform Practice: Adopting a Multi-methods Approach to Complex Questions

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Abstract: Institutional decision making is typically informed by quantitative data. However, the factors that promote student success are many and varied, and have complex relationships that may not be understood quantitatively or be meaningfully quantifiable. While student behaviors may be measurable, the motivations underlying their actions are often inaccessible via quantitative data. This paper describes one approach taken by Grinnell College to understand student success holistically. Researchers noticed students dramatically improving their recent term GPA compared to their cumulative GPA, but were unable to determine the causes of this improvement from the quantitative data. In-depth qualitative interviews, lasting approximately an hour, uncovered the complex factors contributing to students' improved academic performance, as well as the barriers they had previously experienced. Barriers that became facilitators of academic success included class choices, faculty, study behaviors and attitudes, and help seeking. Other barriers included adjustment to the Grinnell environment and suboptimal mental health. Use of resources, self-care, organization, extra-curricular activities, and friendships acted as facilitators. The paper closes with a brief review of how the greater understanding of student motivations underlying their behaviors are being used by faculty and staff in various roles at Grinnell College to inform practice, program development, and decision making.

Introduction

Much of the data about students and institutions are collected, managed, and analyzed by institutional research (IR) offices. The majority of IR offices in institutions of higher education in the United States are staffed with analysts and managers skilled in quantitative methods and data management (Harper and Kuh, 2007). A recent national survey of IR Offices (Swing, Jones, & Ross, 2016), showed that approximately 80% of these offices hold primary responsibility on campus for federal and state mandatory reporting, the reporting of data for national rankings, and the creation of institutional fact books, with other primary duties including enrollment reporting and analysis, data sharing, and the monitoring and development of key performance indicators. The same survey found that IR staff also frequently have shared responsibility for contributing to accreditation studies, strategic planning, and outcomes assessment. Thus, in addition to fulfilling reporting requirements, many IR offices gather and provide data to inform institutional decision making. The data that IR staff frequently assemble and manage for reporting and internal decision making are largely measurable or sortable variables. These quantitative data provide decision makers with helpful information about a wide variety of patterns and associations among a very large number of institutional constituents.

The topics of student success, engagement, retention, and college experience in general have been extensively studied quantitatively in the literature, with a sizeable body of literature stemming from the seminal works of Astin (1977), Tinto (1975) and Pascarella & Terenzini (2005), to name a few. The vast majority of studies cited in literature reviews of student success (e.g., Kuh, Kinzie, Buckley, Bridges, and Hayek, 2006) are also quantitatively oriented. These important works have necessarily used quantitative analytical techniques because of their desire to study a very large sample population and for their findings to be widely generalizable. They have shown that the factors that promote student success are many and varied, and have complex relationships with each other. In aggregate, their statistical findings are substantial and very informative for higher education scholars and practitioners.

Student success and retention, however, happens at a personal level; retention rates are comprised of individual students deciding to remain or leave. Subsequent use and application of these seminal theories in a variety of contexts and for a variety of populations show that organizational and social context can be important. There have been many studies applying, updating, revising, and adding to the seminal works in the field of higher education to investigate or take account of various elements of pedagogical design or context (e.g., Braxton, Milem, & Sullivan, 2000; Willging & Johnson, 2009), diverse populations (e.g., Quaye & Harper, 2014), as well as many other contexts and uses. Behind each student who leaves an institution prior to graduation is an individual set of factors that are salient to that particular student's college experience. These various factors may not be entirely quantifiable or understood quantitatively, and they may not adhere to the statistical trends shown in the larger studies due to the student's background, personality, behaviors, organizational culture, personal assumptions, or any other dimension that contributes to the student's lived experience.

Although large quantitative studies provide us with trends and action items to provide assistance to students, these studies can only quantify the factors that they choose to measure. Studies cannot examine relationships between the multitude of factors of which researchers may be unaware, for any given student, at the time of measure administration. Additionally, the interplay of factors that can and do influence each individual's student's likelihood of persisting to graduation at any given institution is dynamic. As students' circumstances change, so too may their outlook, desire, self-efficacy, and ability to continue their education. Thus, factors that may influence students' behaviors regarding persistence may not be measured or counted, or may occur after measure administration. Therefore, quantitative researchers may be unable to see these factors, when examining larger datasets with data from student records or administered measures.

Turning from the literature to studies conducted by institutions to aid decision making, there are additional complexities in working with quantitative data. Within a single institution, particularly a small college, there may be patterns visible quantitatively that do not reach statistical significance due to the limited sample size. It may also be that the complex and multi-faceted nature of student success does not lend itself to the identification of clear patterns in commonly used college administrative records. Also, within the cultural context of a single institution, it is plausible that there are immeasurable cultural factors that influence students' behaviors that would be masked in a multi-institution, larger study.

Decision makers requesting data from IR offices often like to understand trends, and even causality, in the data. However, to inform practice around enhancing retention, institutions need to be able to understand the factors that influence premature departure sufficiently to be able to prevent future departures. This requires a deep understanding of student motivations for their behavior, as well as student interpretations of the campus culture, of the behaviors of campus constituents, and of administrative actions. Individual interpretations are complex and highly varied; ultimately, while student behaviors may be measurable, the motivations underlying their actions are often inaccessible via quantitative data.

In addition, many scholars and practitioners have framed student success as a broad term with relevance to process improvements in a variety of departments or administrative units. In some cases, a wholly quantitative approach will be insufficient at best and misleading at worst to understand and address leading causes of attrition in different parts of an institution. Most process and quality improvements related to student success require both data and an appropriate interpretation for informed

decision making, as well as practitioner knowledge and understanding of cultural nuances. Such cultural understanding and contextual interpretation may be more readily provided systematically by qualitative research conducted at the institution in question.

This paper describes a new approach taken by Grinnell College to understand student success holistically—the use of multi-methods research. This approach is distinct from the more commonly used 'mixed-methods' research (Johnson, Onwuegbuzie, & Turner, 2007) in that the defining characteristics of each method are unique, and are applied in a complementary fashion to similar, but necessarily different, research questions in distinct studies around a common problem. Although the purpose of this paper is not to present the study's results in depth, the results may be of interest to faculty and staff at institutions of higher education who work on matters of student retention. They also highlight the richness of data available using this method, thus illustrate well the benefit of the approach. Therefore, study results are presented briefly, along with a small number of illustrative quotes.

Method

As researchers in the Office of Analytic Support and Institutional Research (OASIR) at Grinnell College, we were asked to identify students who had dramatically improved their grade point average (GPA) compared to their previous semester's cumulative GPA because the president wished to congratulate these students on their improved academic performance. Once we identified these students, curiosity about their method or circumstances of their academic performance drove us to investigate a myriad of available quantitative data types. These included demographic factors, previous academic performance, high school preparation, reported high school behaviors from the Higher Education Research Institute Cooperative Institutional Research Program (CIRP) Freshmen Survey (Higher Education Research Institute 2017), admissions criteria, and other administrative data as available. However, ultimately there were no statistically significant differences that explained these students' improved academic performance.

This type of investigation is consistent with a variety of other quantitative student success-related research questions the office has addressed; we have termed this set of research questions the "attrition syndrome." This set of analyses involves analysis of the predictive ability of standard measures mentioned above, along with analyses of a complex set of mental health-related factors that may be related to attrition, as well as analyses of the Grit scale (both individual items as well as the holistic measure) created by Angela Duckworth (Duckworth, Peterson, Matthews, & Kelly, 2007). As with many research studies, analyses into the attrition syndrome begin with summary statistics and description, and regularly take the form of binary or count outcomes analysis (logistic or Poisson regression, where appropriate), or alternative forms of estimation including two-stage least squares and evaluation of instrumental variables for use when direct observation of the variable of interest is not possible or is likely to be endogenous. Given the relatively small sample size for many of our analyses, we cannot use recently popularized methods of advanced "data-science" due to either their methodological inappropriateness for the questions at hand and/or for the demands they make on data quantity and availability. Additionally, we find that traditional descriptive measures visualized in alternative ways are often more effective for communicating actionable data than providing decision-makers with nuanced descriptions of findings. These visualization efforts have resulted in a variety of unique and immediately understood analysis including what we commonly refer to as "grade-dynamics": a visualization of each student's most recent performance compared to their past history. A variation of this visual also provides us with a path view of a student's academic achievement. This allows us to point out quickly to those who work with students that our numbers indicate an adverse trend in a specific individual's performance, or even in that of a larger group. These specific snapshots of performance show us clearly when a student has changed trajectory, but we cannot determine from this quantitative data, presented in either complex or relatively simple visual form, the reasons behind this change in trajectory.

To investigate the factors contributing to these students' increased academic success, therefore, we decided to conduct an in-depth qualitative study. This study adopted an interpretive, constructivist approach, using narrative data obtained from individual interviews. Qualitative methods help researchers "to understand the meaning people have constructed about their world and their experiences." (Merriam, 2002, p. 4-5). They provide rich descriptions of complex phenomena, capture the range of interpretations held by a variety of constituents around key events and campus conventions, describe motivations for behaviors and choices, and can uncover the constructs and factors at play in particular focal areas. Qualitative methods are particularly helpful when there are limited numbers of individuals related to the topic of interest, and when the topic is sensitive and/or complicated. The multiple layers of complexity that OASIR staff thought could be contributing to students' substantially improved grades made qualitative methods an appropriate method for this study, especially after quantitative data had found no significant differences in the groups to explain their improved academic performance.

Narrative research data consist of stories detailing the narrators' experiences of lived events (Merriam, 2002). People understand, explain, and make sense of their lives and the world about them through stories. They then use these stories to articulate the meaning they have subsequently constructed from their experiences. Narrative methods seek to uncover both the inner and outer meanings individuals create from their lived experiences, i.e., what the experiences mean on a personal level to the individuals, as well as on a social level in terms of an existing external environment (Clandinin & Connelly, 1998) This study thus solicited stories around a particular topic—students' experiences of academic difficulty before increasing their grades at Grinnell College—to reveal the meaning-making they had performed, as well as the strategies they employed to improve their academic performance.

Having obtained approval from Grinnell College's Institutional Review Board, we invited 39 students to participate. These students were those identified for the president's congratulatory message, as well as others who showed remarkable and substantial improvement in their academic performance. These students received an invitational email to participate in the study. Those who volunteered participated in individual semi-structured interviews that covered topics suggested by the persistence literature and former research at Grinnell. First, participants were invited to tell their story of their academic improvement, bringing in whatever factors they perceived as relevant. Then they were asked about faculty, friends, institutional belonging, activities, post-graduation goals, and any other factors that they think may have contributed to their higher grades. Although the interviewer ensured all topics were covered, participants were invited to take the lead in these interview-conversations (Mishler, 1986), to ensure that the scope of the conversation was not limited to the factors about which the interviewer asked.

We assigned participants pseudonyms to protect their identities, transcribed the interviews verbatim, and coded the transcripts deductively and then inductively using NVivo 10 (QSR International, Melbourne, Australia) software. Analytical memoing and iterative coding—to recode data into themes that had emerged subsequent to when a transcript had initially been coded—were an integral part of the analytical process. We invited participants to read a full draft of the report to verify that they were comfortable that their quotes were presented in the context in which they had stated them, and that the researcher's interpretations were appropriate. This process is also known as "member checks;" it contributes to the credibility, and therefore quality, of qualitative research (Lincoln & Guba, 1985). We also asked participants to suggest any changes they felt were necessary to protect their identity.

Results

Of the 39 invited students, 26 students agreed to participate, and 22 attended an interview. The interviews lasted an hour, on average, and provided substantial data pertaining to the complexities and factors contributing to students' improved academic performance ("facilitators"), as well as the barriers they had previously experienced. Although we had not specifically asked about the barriers to academic success, participants frequently raised the issue as essential to understanding the narrative around their subsequent improvement. In many cases, once participants had found ways to overcome barriers or

reframe their experiences in a more positive or more productive manner, they began to see almost immediate academic improvement.

The barriers and facilitators can be largely grouped academic or social/personal domains (figure 1). The academic barriers mainly had strongly related facilitators; the academic barriers that subsequently became facilitators included class choices, faculty relationships, and study behaviors and attitudes. Social barriers had a less direct relationship with their associated facilitators, although seeking help was both a barrier and facilitator. Other barriers included adjustment to the campus environment and mental health issues. Use of resources, engaging in self-care, getting organized, extra-curricular activities, and friendships were social/personal facilitators that improved the circumstances of students who were struggling to adjust to being at college or who had suboptimal mental health.

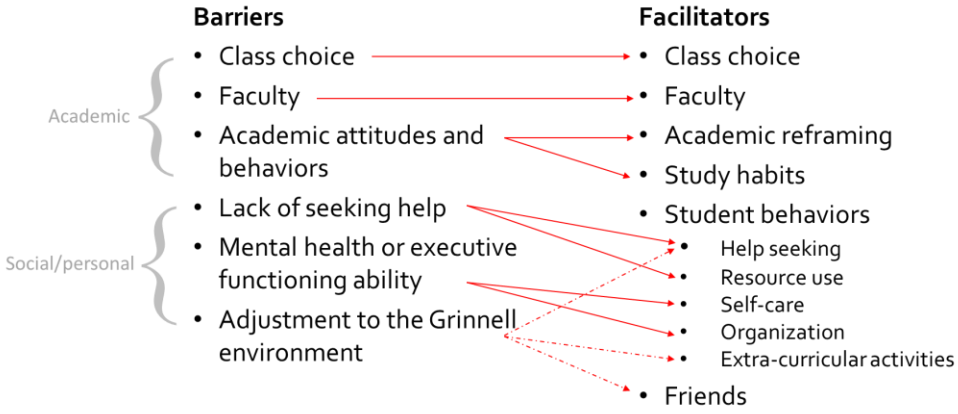

Figure 1: Relationship of barriers to student success and associated facilitators

Academic Barriers and Facilitators

Class Choice

A number of participants described finding that, once in a class, they found they were substantially less interested in it than they had expected. Often this stemmed from a poor understanding of what it would mean to take the class in terms of their own intrinsic interest, the type of work involved, or the pedagogical style employed. In these cases it was sometimes the case that the student had received incomplete or very limited advising around class choice, especially in the first semester. Lack of interest led to a lack of class engagement, and frequently poor class attendance. To compound the matter, once a student started to struggle in one class, miss classes, or stop doing the homework in one class, the behavior was contagious, with the student adopting this behavior in other classes in which they were not previously struggling or disengaged.

However, as students discovered the courses in which they were intrinsically interested and inherently motivated to learn more about the topic, their grades improved. Additionally, finding classes that had a pedagogical style, the type of work, and faculty personalities with which they were comfortable, their performance improved.

Given these experiences, participants strongly recommended being deliberate and intentional about course choices. They stressed the importance of carefully reading the course catalog, and talking to other students, their advisors, and other faculty members about different courses they were considering. Participants also advocated taking a variety of disciplines early in one's college career, rather than narrowing down to an intended major early.

Relationships with Faculty

Interacting with faculty was remarkably intimidating for a number of participants, particularly domestic students of color and first generation students. In quite a few cases, students did not know how

to interact with faculty because faculty appeared unapproachable to them. One student commented, "I don't think a lot of people know that professors aren't trying to fail you. … For the most part, if you need to, they're going to meet with you every day if they can. And I didn't know that in my first semester." Particularly where students were performing poorly in a class, talking to the faculty member teaching the class meant that the student needed to confront their underperformance on a personal level, which was intensely uncomfortable; it was easier and more comfortable not to do so. For many students, the barrier between themselves and faculty was due to a near-deification of the faculty; these students saw achieving a faculty position at an elite liberal arts institution as having reached the pinnacle of academic success, increasing the distance they felt between themselves and faculty members.

Closing the gap between themselves and professors occurred in a variety of ways. One common stimulus for this shift was for students to recognize that "professors are people too." Once students saw faculty as fallible humans, they were able to begin forging relationships with faculty. Having informal conversations with faculty and seeing how faculty have struggled and then achieved success was instrumental in this regard. Students also benefited from asking their peers how to approach faculty, and recognizing that making an effort in a class makes approaching the faculty member easier. Participants appreciated faculty celebrating their effort and their small successes, stating that this made faculty feel more approachable.

Establishing trusting, strong relationships with faculty was important for academic success. Feeling comfortable interacting with faculty meant that participants were more apt to go to office hours and seek help. Over time and after numerous conversations with faculty and advisors, some participants then began to see faculty as collaborators and mentors in the student's education, rather than directors or puppet-masters of time passage through college.

Study Attitudes and Behaviors

This reframing of faculty members' roles occurred as students' attitudes and behaviors surrounding their studies also changed. Like many of their peers, most participants had been academically successful in high school without substantial effort. Consequently, many recounted not fully understanding how academically rigorous Grinnell is, or the importance of regular class attendance and keeping up with class work. If students began to disengage and missed a class or two, they found it hard to return to the class. They thus entered a spiral of not doing homework, not attending class, and earning failing grades. Trapped in this cycle, many felt that working hard was almost futile because it did not lead to the results they desired: "It was kind of the slippery slope effect. I felt myself going downhill, but I just couldn't stop it. And once it got started and I got behind on work, I stopped, kind of gave up, I felt like, 'What's the point?'"

Once students started to improve their academic performance—often through finding classes they loved and establishing relationships with their faculty members—they had the insight to recognize their former lack of ownership of their studies and the necessity of taking charge of their academic progress. As they discovered in which courses they were intrinsically interested, some participants began to change how they thought about academic work, finding new value in the knowledge and skills they gained, as one student described: "I kind of realized, 'It's not about grades so much as it is about learning as much as you can, and learning to enjoy your classes." As their personal horizons broadened by learning new material, meeting more people on campus, and engaging in extra-curricular activities, they were able to find personal connections to their class material, making the work more meaningful. They began to learn for learning's sake rather than to earn a grade or for credits. For a few participants, this process eventually led to an identity shift around their studies, where they began to see themselves as "the kid who loves to learn." Other participants did not experience a shift of this magnitude, but they developed new academic self-efficacy, which motivated them further. Perhaps for the first time, some participants felt that they did indeed belong academically at Grinnell, and they deserved to be here—something many had doubted previously.

Participants often mentioned their former lack of effective study habits and the distractions in which they would engage, as well as the many and varied justifications they gave themselves for this

behavior. Receiving one or more failing grades was a clarion call to behavior change for many participants. With help from academic advising, faculty members, friends, and parents, participants largely changed their study habits, finding that, "You can work a lot harder than you think you can." Of the many different methods available to study effectively, participants described having to test various strategies until they found an approach and method that was most effective for them. Once discovered, they stuck to this method either through determination to improve their grades, or because the results were so dramatic that they were motivated to do so.

Social or Personal Barriers and Facilitators

Adjusting to the Campus Environment

Many participants described experiencing entry shock their first semester, and having a difficult time adjusting to the college both as an institution and the town of Grinnell. Students from urban areas and domestic students of color, in particular, struggled to adopt to life in rural Iowa, with its predominantly white population: "I felt very black when I came to campus." The academic culture of the institution was foreign to many participants, who often now had to confront the "hard realization" of not being at the top of their class, as they had been in high school. Participants described entering this unfamiliar setting, with few or no friends, and feeling more academically challenged than ever before. Until their basic needs of friends and some level of competence in managing their daily lives were met, students could not attend to their academics. This was a barrier for which the corresponding facilitators were more loosely connected. To adjust, or feel like they belonged at the institution, participants had to take multiple other steps, such as learning to seek help, using available resources, finding fun activities, and making friends.

Seeking Help

Asking for help, or even identifying that they needed help, was extremely difficult for most of the participants. Having excelled in high school, many did not know how to ask for help. Often, they lacked the institutional knowledge to know whom to ask for help. Some simply did not know even that they needed to ask for help: "[I was] just going through, not asking for help, because I didn't know to ask for help." Participants frequently had established no help-seeking identity, describing themselves as not being someone who asks for help. A number of participants were also worried about being judged for needing help. In some cases, students described help being offered multiple times by staff and faculty, but the students were too uncomfortable receiving help or acknowledging their need for it. Trying to get by alone, some participants eventually sunk into a quagmire of disengagement and academic failure, paralyzed by their inability to accept help and too anxious to embark on behavior change alone.

Even when students had largely accepted the need to request help, a lack of knowledge about the plethora of available resources on campus prevented many from accessing the type of support they needed. Students learn of a variety of resources during new student orientation, but it is one of many sets of information they are given, and often they do not retain it. Having a staff member, advisor, or friend help participants identify potential resources played a large role in them commencing efforts to reach out for help and use the resources.

However, there are multiple steps between identifying the need to ask for help, and ultimately receiving help. Participants described needing self-awareness to recognize one's need; courage to ask openly for help and expose oneself as needing it; time to visit the resource; and organization to schedule appointments or arrange time to meet the people providing the assistance. It is very easy for any of these multiple links in the chain between needing and receiving help to break, and students described a failure to follow the full chain to the end as a barrier in itself.

Mental Wellness

Mental wellness is an important issue for students across the nation. In interviews, Maslow's (1943) Hierarchy of Needs emerged as highly relevant when thinking about mental health. Participants

described not being able to muster motivation to study or even care about grades when trying to overcome mental health challenges. When managing mental illness, whether sub-clinical or clinical, a number of participants described experiencing limited executive functioning ability; they lacked the organizational skills and follow-through behaviors to ensure that they were doing all they needed to do, academically.

Participants who experienced some of the most pre-occupying mental health challenges eventually recognized the need for self-care. They often came to this realization during the breaks from college, when they had to time contemplate how to improve their college situation. Once they recognized this need, students described changing their behaviors to prioritize self-care activities higher, and to desist from activities that may be harmful. They also arrived at some personal insights into their experience of and their behavior within the institutional culture.

Extra-Curricular Activities

There were two facilitators that were not directly linked to a specific barrier, but that had a more holistic positive effect on participants and their college life. The first is extra-curricular activities. Joining clubs and getting involved with activities, while a time burden, forced students to be intentional in managing their time. With a fun activity scheduled later in the day, students were more likely to complete a portion of their studies earlier, rather than using the middle of the day as leisure time and studying until late at night as a consequence. Activities also helped participants clarify their interests, which then allowed them to find more personally relevant classes. Finally, joining a club also opened up a network of friends with similar interests.

Friendships

Making friends was helpful in numerous ways. Friends provided a support network for all sorts of troubles, and generally boosted participants' spirits. However, participants did note the importance of finding friends whose behaviors they would like to emulate; if their friends were all studying, participants said they were also more like to study. Friends provided advice and social wellness for participants, but many recognized only in retrospect the time and effort required to form meaningful friendships. Often, students arrived at college never having had to make this effort. Therefore, several participants did not realize that they would have to do this, or were reluctant to do so. However, some explained that once they were willing to make themselves vulnerable, by opening up to others about inner thoughts, the effort was rewarded with true and lasting friendships.

Discussion

The brief results presented above demonstrate the complexity and variety of experiences, attitudes, perceptions, and assumptions that affect students' lives on campus. It is important to remember that participants did not experience these barriers and facilitators in isolation; frequently they were grappling with multiple barriers concurrently. As one barrier was overcome or reframed to become a facilitator, so others were often able to dissolve, either as a result of the student's new positivity, new behaviors or perceptions, or new relationships.

Deep and Rich Data

The interplay of these barriers and facilitators was individual to each participant, but, in aggregate, the data the 22 participants provided allow readers of the study's findings a glimpse into some common experiences. Understanding *why* some students found faculty intimidating is an added dimension that would be difficult to capture fully in a quantitative survey, if researchers even thought to include this as a possible answer or question. However, without a deep understanding for the causes behind some students' sense of intimidation, it is difficult for faculty to know what behaviors they could reasonably modify to begin to show themselves as fallible humans interested in providing a meaningful educational experience to all students. Similarly, if faculty advisors do not fully appreciate the potential consequences

of students choosing classes somewhat haphazardly, or at least without legitimate intentionality, they may not give as much thought and attention to advising meetings as some students may need, even if the students themselves are unaware of their need when they are choosing courses. The results around resource use and help-seeking were illuminating of the multiple steps in between students recognizing they need help, and actually obtaining the help. Without this understanding, the only data around resource use would be numbers and types of students using specific resources on campus, as well as their grade improvements that may result from this help.

An additional, helpful insight from the data results not just from its qualitative nature, but particularly from the exploratory nature of the interviews and the interview style we employed, yielding to participants the power to lead the conversation to wherever they thought was relevant. We reached a deep understanding of the reframing in which students engaged of their attitudes to faculty and academic work only by inviting participants to raise these issues and talk about them at length, as well as then asking them about the ramifications of their new insights and views. In some cases, during the course of protracted descriptions of how their views changed, students created or clarified new insights of their own about their experience, during the interview. Thus, for some participants, engaging in gently guided, thoughtful reflection led to renewed awareness of their agency in their academic improvement.

The inclusion of a qualitative researcher in OASIR, and therefore the adoption of a multi-methods approach to some taxing questions, has brought positive feedback from around the institution. Previously, we had to limit our investigations of some questions when our results found no statistical significance, but now we have the opportunity to investigate them more fully. When studies using quantitative data reach no statistically significant findings—often because of a small sample size—we are able to dig deeper into the issue with in-depth interviews and reach a level of understanding about what is happening for a sub-section of the possibility. Although qualitative findings are not widely generalizable in the manner of statistically significant findings, they illuminate some common experiences of the group of students under study, and thus can enhance appreciation of students' perspectives and needs.

Implications for Practice

We have presented the results from this study to various campus constituents, including administrative leadership across the institution, faculty, student affairs and advising staff, trustees, and student government. Many people, in a variety of positions, have appreciated hearing students' aggregated experiences in their own words. Well-chosen quotes from the data can illustrate a point with great clarity and strength, conveying the accompanying emotional consequences of an experience that are often unavailable to researchers working only with quantitative data. As a result, the data are more accessible to those readers who find representative stories or quotes more compelling than statistics.

Many readers of the report or audience members in presentations have noted the face validity of the findings; that is, they too had experienced or witnessed one or more of the barriers or facilitators, or shared, in some way, an experience described in the report or presentation. Staff from academic advising and student affairs staff appreciated the empirical evidence that the results provide of what they know as professional knowledge gleaned from working with many students over longer periods. They particularly welcomed that the report brings attention to the interplay among the factors, because working out how to manage multiple stressors and emerge from them in a positive manner is problematic for many of the students with whom they work.

College leadership have been using quantitative data to inform their decisions, and plan and evaluate programs for considerable time. Most notably, OASIR led the drive for more frequent assessment of student performance and notification of key intervention staff when appropriate. As is typical at many small liberal arts colleges, Grinnell is faced with the challenge of extended lag time between observations of student performance, namely end-of-term GPA. To combat this lack of actionable information during each semester, the college implemented a mid-term assessment program for all first-year students. Although not as granular as mid-term grading, this three category assessment provided key staff with an indicator of 'solid', 'marginal', or 'at risk' academic performance for every first-year student in each of their classes during the semester. In addition, these categorical data provide

researchers with an estimate of student performance at another point in time. Although immediately helpful in many ways, this additional data point cannot provide us with any information on how students who end up earning a high grade achieve this, or conversely what hampers the success of those who have 'at risk' or 'marginal' reports at the mid-point of the semester. Although we can observe some limited behaviors, for example number of visits to academic advising, these types of data act as only a proxy for the change in behavior we are attempting to understand.

Results of the qualitative study detailed in this paper have further informed decision making and program development in multiple domains around campus. For example, faculty teaching a first-year seminar, who also serve as a student's advisor until they declare a major, have been made aware particularly of the findings regarding faculty relationships and class choices. Student affairs staff planning new student orientation have recognized the benefits of making small changes to orientation, based on what the results showed about students' awareness of campus resources and willingness to seek help. The qualitative study results have been used by faculty and staff developing a new pre-orientation program to fine-tune particular aspects of the program so that it is most helpful to incoming students.

Students who have become aware of the study from attending presentations and from casual discussions with OASIR staff seem to find much more meaning in the qualitative results, possibly as a reflection of their own experience, than they do with graphs or numbers presented from quantitative research. The results have also been shared with all senior-level administrators, to provide them with additional institutional insights and context to the decisions that their units will make.

Conclusion

The combination of rigorous quantitative methods and in-depth qualitative research as employed by Grinnell College and described here has provided institutional decision-makers with a rich and deep understanding of why some students behave in the manner that we have seen through our professional experience of working at the institution, and that have been quantified in a variety of surveys and reports. While the data do not, and cannot, explain all student behaviors, or pertain to each individual student on campus, they contribute to an appreciation of how students experience the institution, and therefore what may assist students in taking full advantage of their undergraduate experience, and completing their bachelor's degree.

This methodological combination also yields the development of an interesting cycle of question and answer in the higher education context. In this case, quantitative research drove the implementation of a qualitative study. In turn, the findings here may drive future quantitative studies. The themes, which emerged inductively from the qualitative data, often had not been considered previously as variables for quantitative measure, but could be incorporated in additional study related to student success.

There is also professional capital to be gained for the OASIR staff from the inclusion of a qualitative researcher. On a campus with a variety of different epistemological perspectives, the credibility and value of the entire research team is bolstered by adopting an holistic view of the issues at hand. Some practitioners may find more accessible the data that they can easily recognize as mirroring their professional day-to-day experiences, compared to presentation of statistics and trends. Additionally, as research staff, our approach to a variety of studies has benefitted. Central to the process of developing research questions is the dialogue that happens organically among researchers, as well as between researchers and campus constituents. These conversations are especially valuable when the researchers can bring to light new and diverse perspectives on the questions at hand, as well as an informed and constructive criticism of each other's work. This more accessible and epistemologically inclusive approach has strengthened our relationships with a variety of campus constituents.

This case study and the Grinnell College OASIR structure presents a unique application of multi-methods research. The case presented here is a prime example of the added value from the inclusion of qualitative research, not only for a deeper understanding of the research questions at hand, but also in the guidance that the results of the qualitative study provides for future quantitative work, and implications for higher education practitioners.

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