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This chapter describes how campuses can use longitudinal data to investigate and improve the experiences and engagement patterns of their first-year students.

Using Longitudinal Data to Improve the Experiences and Engagement of First-Year Students

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Students enter our campuses with a variety of high school academic and co-curricular experiences, family backgrounds, and other factors that influence and shape their expectations and attitudes toward college, as well as their actual experiences and success in college (Kuh and others, 2005; Pascarella and Terenzini, 2005). Therefore, to better understand first-year student engagement, it makes sense to consider the background and precollege characteristics of entering college students. To do this effectively, however, requires access to longitudinal data that connect student-level precollege information with actual first-year experiences.

This chapter has two goals. The first is to briefly describe the relationship between precollege student characteristics such as their high school engagement and their engagement expectations for the first year of college with their subsequent first-year engagement and experiences. The second is to present concrete examples of how campuses can use longitudinal data to better understand the experiences and engagement patterns of their first-year students.

Using Longitudinal Data to Assess the Student Experience

There is growing internal and external pressure for institutions to expand their assessment activities to improve student success. Although use of one-time surveys that give a cross-sectional view of the student experience is common, the value is somewhat limited (Astin and Lee, 2003). For instance, cross-sectional data can answer the question, "How many times do students meet with an advisor?" Longitudinal data can answer this same question, but also potentially furnish important information regarding student characteristics and prior experiences that may help in understanding why some students meet with their advisor more frequently than others. Precollege assessment data regarding student characteristics and experiences supply important baseline information that can be used to document the effectiveness of program-level as well as institutional initiatives (see Cole, Kennedy, and Ben-Avie, 2009).

There are many assessment and survey instruments available for institutions to use. This chapter employs longitudinal data from institutions that participated in the Beginning College Survey of Student Engagement (BCSSE) and the companion National Survey of Student Engagement (NSSE). BCSSE collects information from entering first-year students prior to the start of their fall class. The survey includes questions regarding high school engagement, co-curricular experiences, and other important high school educational experiences. The survey also asks students about their expectations of being engaged and other important attitudes regarding the upcoming first year of college. NSSE asks students about their engagement and participation in a variety of important educational experiences (see http://www.nsse.iub.edu for more information regarding these two surveys). For this chapter, we report two NSSE benchmarks indicating academic engagement: (a) level of academic challenge (LAC) as measured by the amount of writing, reading, and higher order learning activities, and (b) as measured by active and collaborative learning (ACL) as measured by class discussions, presentations, and working with peers.

The examples presented in this chapter represent real, longitudinal data from the BCSSE 2008 and NSSE 2009 administration. The data do not represent one specific institution, but instead results from fifteen hundred randomly selected first-year students who completed both BCSSE and NSSE from baccalaureate-granting institutions across the United States. For the purposes of this chapter, these students represent the entering first-year class of "BCSSEville State University."

There are a multitude of important potential assessment activities on any campus. For this exercise, campus leaders at BCSSEville State are interested in using BCSSE-NSSE data in three specific ways. One is to inform faculty development initiatives. The director of their Center for Teaching and Learning wants to present the results from these surveys to faculty, particularly those who teach first-year classes. In addition to faculty development, the provost is particularly interested in evaluating the learning communities and service learning programs.

Faculty Development

After meeting with the institutional research office, the director of the Center for Teaching and Learning requested a report containing information regarding the characteristics of the incoming first-year class and the students' high school academic engagement and subsequent expectations of being engaged in their first year. The director was also interested in finding out more about those students who feel somewhat alienated from the faculty. The institutional research office put together the results shown here, with comments and interpretation.

Past, Expected, and Current Engagement Patterns of Entering First-Year Students. As expected, students who report a lower level of high school engagement and lower expectations of being engaged in their first year are more likely to be less engaged during their first year of college. For instance, of the entering first-year students who reported high school engagement in the lower one-third, 54 percent of them reported ACL scores in the lower one-third near the end of the first year (see Table 4.1). Only 16 percent of students in the lower one-third of high school engagement reported ACL engagement in the upper one-third in their first year of college. The same pattern existed for the more engaged high school students (top one-third) in the opposite direction; only 17 percent reported first year college engagement in LAC and ACL in the bottom one-third while around half of them reported engagement in the top one-third for both LAC and ACL.

A similar pattern was found regarding students' expectations of being engaged. Half of those who expected being less engaged in their first year of college reported lower engagement in ACL and LAC. Around 16 percent of the students in the lower-expectations group actually reported engagement in the top one-third for ACL, and 19 percent in LAC. Students in the higher-expectations group showed a similar trend; almost half of the higher-expectations students reported more engagement in ACL and LAC, while only 18 percent reported less engagement in these two measures. However, out of all this analysis, the faculty were interested particularly in the less-engaged first-year students.

Why is it that some students who were engaged less in high school end up being highly engaged in college? What types of engagement distinguish these highly engaged students from their peers who remain less engaged? These are important questions to ask in that their answers offer critical information regarding what types of educational experiences and teaching practices may have the greatest impact on engagement. Though important, these are not easy questions to answer, given that this requires access to longitudinal data.

To answer these questions, the institutional research office recoded engagement items from NSSE such that the response categories "often" and "very often" were collapsed together. They then ran analysis comparing the percentage of less-engaged high school students who became less-engaged first-year students (aka "less-less") with less-engaged high school students who became more-engaged first-year students (aka "less-more") who indicated often or very often to twelve academic engagement items.

Table 4.1. High School Engagement and Expected Engagement Patterns by First-Year Engagement Patterns

		First-Year ACL			*First-Year ACA*		
		Low 1/3 (*n* = 525)	*Middle 1/3* (*n* = 506)	*Top 1/3* (*n* = 451)	*Low 1/3* (*n* = 492)	*Middle 1/3* (*n* = 491)	*Top 1/3* (*n* = 494)
High school engagement	Low 1/3	54%	30%	16%	45%	35%	20%
	Middle 1/3	35%	39%	26%	38%	33%	29%
	Top 1/3	17%	34%	49%	17%	31%	52%
Expected engagement	Low 1/3	52%	32%	16%	48%	34%	19%
	Middle 1/3	36%	38%	26%	34%	35%	31%
	Top 1/3	18%	33%	49%	18%	31%	51%

Of course, the institutional researcher expected the less-more group would be higher on all items. However, the goal of this analysis was to identify those items (behaviors) with the largest differences between the groups. There were five items where the difference between the two groups was 50 percent or greater, with the greatest difference being "discussed grades or assignments with an instructor" (difference of 63 percent). For this behavior, of those students who were less engaged in high school and maintained lower engagement in college, only 18 percent indicated they discussed grades or assignments with an instructor. This was in stark contrast to the 81 percent less-engaged high school student peers who subsequently reported higher engagement during their first year. The faculty members were not so surprised to see that there was a big distinction (55 percent difference) between less-less and less-more students regarding classroom engagement (asked questions in class and made a class presentation). Working with other students outside the class (53 percent difference) and discussing ideas from readings with others outside of class (50 percent difference) were similarly very different for these two types of students. However, the faculty were quite surprised to see that less-less engaged students and less-more engaged students were not that different regarding the number of books read and number of papers written. They were also surprised to see that the less-more students spent approximately six more hours studying per week than the less-less students.

Overall, the report confirmed what a number of faculty suspected: many students who were less engaged in high school continued to be less engaged in college. The report also yielded important contextual information that supported practical and meaningful change. It pointed to areas where faculty may be able to intervene and raise the engagement level of these less-engaged students. One thing the faculty learned was the compensatory effect of student-faculty interaction for these less-engaged students. Less-engaged high school students, who then reported being more engaged in their first year of college, were much more likely to report that they "often" or "very often" discussed grades or assignments with an instructor. Therefore, the report led to recommendations that faculty should not only make themselves readily available to meet with first-year students but should also find ways to encourage such engagement. The faculty discovered as well that the amount of reading and writing does not distinguish the less-engaged high school students and their subsequent first-year engagement, but rather their in-class participation (asking questions, making a presentation) as well as working with other students out of class distinguishes these two groups. The director of the Center for Teaching and Learning saw these results as an opportunity to work with faculty on developing curriculum that encourages more in-class engagement and use of effective student group work assignments.

the importance of student academic and social integration, especially the need to connect with faculty, to increase student success and persistence (see Pascarella and Terenzini, 2005). To do this analysis, the institutional research office looked at the results from the NSSE item asking students to indicate the quality of relationships with faculty at their institution (for this item 1 = "unavailable, unhelpful, unsympathetic" and 7 = "available, helpful, sympathetic"). They were pleased to report that only about 8 percent of the first-year students indicated a relatively high level of alienation from faculty (response range 1 to 3), whereas 49 percent indicated a positive, meaningful relationship with faculty (response range 6 or 7). Realizing that these alienated students are at higher risk of not returning for their sophomore year, the director and the institutional research office used BCSSE-NSSE data to distinguish how these alienated students are different from their unalienated peers regarding some of their precollege characteristics.

One thing they discovered was that alienated students were significantly more likely to enter college expecting that "interacting with faculty" would be difficult. The difference was significant, with an effect size of .57. These same students were also less likely to indicate that they were certain they would ask instructors for help when they were struggling with course assignments. Again, this difference was statistically significant, with an effect size of .47. Collectively, this indicated to faculty that many of the students who reported feeling alienated from the faculty started college already believing that it would be difficult to interact with faculty. The report also suggested that many students who feel alienated from faculty expected a certain level of alienation and difficulty before the school year even began. This led to the important information that faculty and the orientation staff on campus needed to make improvements.

These improvements included asking faculty and other campus staff to talk explicitly about the availability of faculty assistance and the positive benefits of such assistance early on in the first year. It also convinced the faculty that they needed to "tear down" the barriers that discourage interaction between first-year students and faculty. One way the faculty chose to demonstrate their approachability was to host a series of student-faculty cookouts during Welcome Week, complete with games and other interactive activities. The cookouts were organized by major. The goal was to foster a fun atmosphere where students could get to know faculty positively and meaningfully early on in the academic year.

Program Evaluation

In addition to presenting important information to faculty and staff, BCSSE-NSSE longitudinal data can also be used to evaluate specific programs implemented on a campus. Again, there are many examples that could be used, but this section will use BCSSE-NSSE data to evaluate learning communities and service learning. Both of these examples are designed to provide important information to campus leaders in a succinct report.

Learning Communities. The provost at BCSSEville State supported creation of a learning community three years ago. Since then, there has only been anecdotal evidence regarding its impact on student experience and success. Given the positive benefits of academic engagement for a variety of student outcomes (e.g., persistence and achievement), the provost was particularly interested in the extent to which participation in a learning community fosters student academic engagement.

The institutional research office felt the best way to approach examining the influence of participation in a learning community on academic engagement would be to use a regression model that included precollege characteristics known to relate to academic engagement. Given the consistency of behavior over time, it is reasonable to assume that many past engagement behaviors will persist through the first year of college (Funder and Colvin, 1991). Though past behavior does not necessarily "cause" future behavior (in other words, time 1 and time 2 behaviors are most likely spurious correlations that share common causal factors; Bandura, 1986; Pedhazur, 1997), it is reasonable to treat these past behaviors as controls that allow an institution to better isolate the unique contribution of learning communities on student engagement. As with previous examples, this question could be answered only with access to longitudinal data such as those available to institutions that participate in BCSSE and NSSE.

To be better aligned with the high school academic engagement scale used in BCSSE, the institutional research office created a new academic engagement scale using the similar NSSE items. For instance, an item in the high school academic engagement scale asks students how often they "asked questions in class or contributed to class discussions." On NSSE, this same item is asked but in the context of the first year of college. This newly created first-year academic engagement scale was used as the dependent variable in the learning community and service learning examples below.

According to the BCSSEville State data, the student sample was composed of 37 percent first-generation college students, 33 percent men, and 27 percent minority students. In addition, 18 percent indicated they participated in a learning community. They included first-generation college student status, gender, race and ethnicity, high school grades, high school academic engagement, and participation in a learning community into the regression model predicting first-year academic engagement. This model explained 20 percent of variance in first-year academic engagement. As expected, prior high school engagement accounted for the largest percentage of variation explained in first-year academic engagement, with a standardized effect size of .41. What was of particular importance, though, was the unique contribution of participation in a learning community engagement (.15 effect size). In other words, after one took into account first-generation status (not significant), gender (not significant), race and ethnicity (not significant), high school grades, and prior high school academic engagement, participation in a learning community still significantly contributed to the explanation of first-year academic engagement. To the institution, this lent evidence that learning communities were improving student engagement. The results also showed there is still room for improving the learning community experience to focus even more on effectively engaging students.

Service Learning. Service learning (and the Office of Service Learning) has been in existence for fifteen years now at BCSSEville State. Though there is an annual evaluation of this program, the director of the service learning office, with support from the provost, saw an opportunity to use BCSSE-NSSE longitudinal data to promote even greater insight as to the effectiveness of the service learning program. Similar to the learning community program, the provost and the director were particularly interested in the extent to which participation in service learning was related to student academic engagement.

Again, the institutional research office felt that the best way to approach this would be to use a regression model that included precollege characteristics known to relate to academic engagement. With these controls in place, participation in service learning was then included in the model. As with the learning community analysis, the dependent variable was first-year academic engagement.

This model explained 22 percent of variance in first-year academic engagement. Similar to the learning community analysis, prior high school engagement accounted for the largest percentage of variation in first-year engagement with a standardized effect size of .42. The unique contribution of participation in service learning (.21 effect size) on academic engagement was particularly important. In other words, after taking into account first-generation status (not significant), gender (not significant), race and ethnicity (not significant), high school grades, and prior high school academic engagement, participation in service learning still significantly contributed to the explanation of students' first-year academic engagement.

At BCSSEville State, only a small percentage of first-year students participate in service learning. However, these results presented evidence that service learning was improving first-year student engagement. To increase the number of students who participate in service learning, the director of service learning and the provost decided that more resources and incentives should be given to faculty who integrate a service learning component into their curriculum. They also decided to conduct a follow-up assessment in two years, again using the longitudinal data supplied by BCSSE and NSSE.

Summary

The primary goal of this chapter was to demonstrate how longitudinal data can supply important precollege characteristics that would otherwise be missing in a report generated from typical cross-sectional survey data. We hope that this chapter has highlighted ways in which an institution can use longitudinal data to generate important information for faculty, staff, and campus leaders. Though this chapter used data provided by BCSSE and NSSE, many other surveys and data sources could be used in similar ways. Whatever the data source, we hope this chapter provides impetus for readers to think of how they can effectively use longitudinal data on their campus.

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