

Banking on the Future: Student Academic Performance, Retention, Graduation, and Instructor Type

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Abstract: Students experience challenges with persistence, retention, graduation, and overall academic success in colleges and universities, particularly when courses are taught by adjunct instructors. Using a sample of 21,274 student results in three different general education disciplines from 2010 to 2019, the authors found that there was a disparity between adjunct and full-time faculty members in those key outcomes. The purpose of this study is to analyze data about student persistence, retention, and academic skills and its relationships with type of instructor (adjunct or non-adjunct) to consider the means by which the results may help to respond effectively to negative indicators in those areas. In addition to including adjunct instructors in professional development and student engagement activities on campuses, strategically hiring full-time faculty may result in gains that offset the higher financial outlay for those instructors.

Keywords: adjunct instructors, general education, student retention, student persistence, student success

In recent years, colleges and universities have faced significant challenges relating to enrollment and student retention. On the one hand, university administrators are often preoccupied with the retention of their students, who struggle with academic performance, personal concerns, and financial challenges. As well, public universities have experienced significant cuts in state funding allocations in the last several years. This sometimes precipitates a struggle to staff adequately a pool of instructors who can uphold institutions' high academic standards. To meet enrollment demand, universities have increasingly resorted to staffing courses with adjunct instructors (part-time or contingent faculty whose contracts are based on per-course compensation, usually without benefits) rather than hiring full-time faculty (who earn higher salaries and benefits) (Jaeger & Eagan, 2010, p. 507). Pledging their institutions to academic excellence, university administrators thus routinely engage in efforts to recruit and retain students. This requires a delicate balance in which campus leaders must pay close attention to the bottom line, both in enrollment figures and in the financial balance sheet. The role of adjunct instructors in higher education is central to these concerns about personnel and academic performance. Put simply, courses taught by adjunct instructors often correlate to higher rates of students' withdrawal and poor academic performance, and yet administrators often fear that employing full-time faculty is an onerous financial commitment. How can universities navigate this complex landscape? The purpose of this study is to analyze data about student persistence, retention, and academic performance and its relationships with type of instructor (adjunct or non-adjunct) to

consider the means by which campus leaders may respond more effectively to negative indicators in those areas.

Literature Review

Universities have relied heavily upon adjunct/part-time instructors, particularly to staff the general education courses that are part of most students' core curriculum. These courses are sometimes called surveys, "gateway" classes, or "gatekeeper courses" (Glenn, 2008). Most institutional leaders agree that these courses are crucial, since they expose students to key skills in reading, writing, communication, argumentation, or mathematics. Many students' first exposure to collegiate expectations is in the General Education curriculum. Statistically speaking, a small but substantial cohort also struggle in some of those courses. This is the concern that has generated academic attention: students who earn D, F, or W grades in their college courses face the prospect of a longer timeline to graduation, or withdrawal from college altogether (Glenn, 2008; Ronco & Cahill, 2004). As a result, most authors note that lower rates of student retention and academic performance are strongly correlated to part-time instruction (Harrington & Schibik, 2001; Jaeger & Eagan, 2011; Johnson, 2006; Smith, 2010; Tirelli, 1997). Even when investigators evaluated student performance in the same course but with different assessments (e.g. different final examination questions), they still found that "full-time instructors outperform part-time instructors, on average" (Chingos, 2016, p. 106). Extant research thus tends to cast a critical eye on the academic accomplishments and engagement of students who take courses with adjunct instructors.

As a result, research has often focused on the relationship between adjunct instructors and student academic performance. Some authors acknowledge adjuncts' tenuous position in academia. These instructors are often poorly compensated; they receive no benefits; and they often work in areas that limit their abilities to store materials or to enjoy private conferences. Scholarly research characterizes adjunct instructors as an exploited group whose working conditions contribute to their students' inability to complete or pass their courses (Childress, 2019; Louis, 2009; Rhoades, 2020). When these authors claim that "faculty's working conditions are students' learning conditions," they suggest that adjunct instructors' lack of resources or motivation is not only a reflection of their own experience (Rhoades, 2020, p. 329). Rather, these authors suggest that a ripple effect impacts their students, other faculty (including full-time colleagues), and American education generally (Childress, 2019; Jaeger & Eagan, 2011; Twigg, 1989). There is only limited research to suggest that "an institution's proportion of part-time faculty does not have a statistically significant impact on retention and graduation, controlling for other input variables" (Deutsch, 2015, p. iv). As well, even when researchers claim that there is little difference in retention or academic outcomes for students, they still note that the diminishing proportion of full-time faculty can lead to other problems. As Hollis (2015) puts it, "less full-time faculty yields less service to students" (p. 5). In essence, most scholarly research about adjunct instructors simultaneously notes the need for their contributions, but also bemoans the negative impacts upon students with whom they work.

Academic persistence (that is, steady progress toward graduation) is also a significant consequence of part-time faculty instruction. Of the 3,000 colleges and universities nationwide, Strikwerda (2019) found that "fewer than 300 of these institutions graduate at least 70 percent of their students within six years" and that "nationwide, only 59 percent of students graduate within six years." While Strikwerda's primary concern focused on instructional culture and its focus on at-risk students, he noted that "introductory courses are crucial make-or-break arenas." As a whole, the available scholarly literature agrees that adjunct instructors often teach introductory courses, yet the students who take those classes experience higher rates of poor academic performance and withdrawal. Even those students who stay the course to graduation sometimes struggle to complete their academic

degrees in a timely way. How can institutions grapple with the academic needs of students and the pressing financial concerns that face higher education?

The Challenge, and Some Solutions

This is the crux of the matter: colleges and universities rely heavily on the contributions of adjunct instructors, even though academic research shows that students tend to struggle academically as a result. Only a few scholars have provided suggestions about possible solutions for this concerning trend. One publication, for example, established an aspirational goal: “the important question for those who teach in a traditional undergraduate program is how to increase the positive attributes of adjunct professors and mitigate against what is less positive” (Stenerson et al., p. 26). Those who decry the difficult working conditions of adjuncts suggest that collective bargaining may address labor market segmentation that undergirds the “suspicion, resentment, and distrust generated bidirectionally in the two-tiered system” (Tirelli, 1997, p. 86). To the extent possible, say other scholars, institutions should replicate conditions (such as compensation, day-to-day working environment, or scheduling flexibility) that are more likely to encourage adjunct faculty members’ commitment to institutions (Kuvakas, 2018; Louis, 2009). Finally, other researchers emphasize a broader institutional culture in which improved training for both contingent and resident faculty will help to ameliorate the conditions under which students are more likely to withdraw (Tinto, 2006). Even though academic research reflects valid concerns about the challenges facing adjunct instructors, the proposed solutions remain largely dependent upon significant changes in institutional culture.

The current situation seems daunting, and it focuses strongly upon the very group that contribute heavily to most campuses’ General Education curricula. Unless institutions are willing to alter completely their hiring patterns, criticizing adjunct instructors is both unfair and unrealistic. But the goals of improving retention and persistence among students are valid. Instead of seeing this as a zero-sum game, institutions should consider using a data-driven analysis that targets the courses that correlate to poor academic progress or retention, and prioritizes strategic hiring of full-time faculty to diminish those setbacks. This is more than a matter of comparing salary lines and benefits, since it involves a victory both in student retention and persistence, as well as acting upon the institution’s commitment to quality instruction. In other words, a positive change in any one of these areas may result in gains that impact all of these important academic categories.

At our institution (a small, Midwestern, regional campus of a larger statewide public university system), we face the same conundrum as most other colleges and universities nationwide. Our campus employs adjunct instructors who represent a range of skills, preparation, and experience, and we have experienced challenges with student retention, graduation, and performance. Most importantly, a key topic of interest preoccupied us: we propose here a means by which the campus could fulfill its institutional mission and vision, including the goal of “promot[ing] academic success, access, and affordability for students in higher education by informing the campus community’s decisions through the practical application of research” (Office of Institutional Effectiveness, 2021). A systematic review of students’ performance in General Education courses, alongside retention and graduation data, can inform administrators’ strategic approaches to employment. The payoff is significant, not only for financial reasons, but also because an institution can fulfill its educational objectives more effectively when it improves upon overall success in general education outcomes. Thus, we believe that institutions should engage in a two-pronged effort to improve student outcomes by including adjunct faculty members in developmental efforts both in their instructional skills and also in student mentoring opportunities. It is also a question of investment. Employing some full-time faculty who only teach survey courses may diminish rates of D, F, and W grades, and as a result may improve

retention and encourage timely graduation rates, both of which promise other financial rewards that offset the higher salary and benefits committed to full-time faculty instruction.

Research Questions and Methodology

As noted, administrators are concerned with the relationship of adjunct-to-faculty ratios, adjunct working conditions, and other issues that may impact specific student outcomes like retention and graduation (Childress, 2019; Louis, 2009; Rhoades, 2020). We therefore asked the following research questions:

RQ1. Is there a difference in retention between students who take general education courses from adjunct faculty versus those who take general education courses from full-time faculty?

RQ2. Is there a difference in the graduation rate between students who take general education courses from adjunct faculty versus those who take general education courses from full-time faculty?

We examined two units of retention: semester-to-semester and year-to-year. In other words, did the student return the semester following the course in question, and did they return the following year? For graduation, we used four, five, and six years as benchmarks.

Another potential negative impact noted in the literature is academic performance (Harrington and Schibik, 2001; Jaeger & Eagan, 2011; Johnson, 2006; Smith, 2010; Tirelli, 1997). We therefore asked:

RQ3. Is there a difference in grades received in general education courses between students who take those courses from adjunct faculty versus those who take them from full-time faculty?

We examined students' academic performance by dividing the student data points into two groups: one was the group of students who earned course grades of A, B, or C (resulting in a student obtaining General Education course credit); the other group were students who earned D, F, or W (withdraw) or other marks, such as incomplete, pass, or fail. The pass/fail option is seldom employed by students, so the DFW results, combined with retention data, typically indicate that a student likely would not earn academic credit and thus may be at risk of discontinuing their educational program, or increasing the amount of time required to earn their degree.

To investigate our research questions, we obtained data from our institutional research specialist. These data were gathered from courses in three general education categories: public speaking, composition, and mathematics. We selected these categories because they include a small number of required courses that all students must take, are taught by a mix of resident and adjunct faculty, and include a large number of sections each semester (approximately 10-15 in each category). We excluded other general education categories because courses in those categories rely very little on adjunct faculty (for example, our critical thinking component includes 21 different courses, none of which are taught by adjuncts with any regularity). We also excluded disciplines in which only a small number of adjunct instructors were represented in order to avoid compromising anonymity in our results. Data were drawn from every section of the courses taught from calendar years 2010-2019 in the general education categories of public speaking, writing, and mathematics. Every student who took these courses was represented, providing a dataset of 21,274 data points.

Data for each student were de-identified and included the following: instructor type (adjunct or resident faculty), semester-to-semester and year-to-year retention (yes or no), whether the student graduated in 4, 5, or 6 years, and grade earned by the student. We also obtained demographic data for each student, including sex, socio-economic status (low or high SES as determined by campus definitions), and race/ethnicity. Additionally, we obtained information about course modality (in-person, online, or hybrid), whether the student was a first-time undergraduate or a transfer student, and whether the student retook the course in question.

The data were cleaned and then imported into the statistical software SPSS version 27.0. Then we looked at the variables and further coded it after mutual consultations between the three authors. Some recoded variables, such as “InstructorType,” where all the types of instructors available in the raw data points was coded into adjunct or non-adjunct; the student grades were recoded into two groups: students who received either A, B or C; and students who received all other grades, including D, F, and W). Similar dichotomous groupings were noted in the dataset for other questions like whether they graduated in 4 years (5 years, 6 years) or not; whether they were retained to the next semester and the next year; and whether they were retaking the course. The majority of the data were categorized as nominal and thus we created analysis groups to examine the data.

To answer our three research questions we conducted a series of Pearson Chi-Square tests for independence between the instructor groups (adjunct vs. non-adjunct) and retention, graduation and performance data from the student record sample. We set the significance level of tests at 95% ($p < .05$). Any result with a p-value less than .05 was considered statistically significant at 95% level. We further examined the group counts on each parameter to support the significant result and also noted the effect size. All tests were conducted with SPSS version 27.0.

Results

The sample consisted of 21,274 student data points (40.8% males and 59.2% females) from 7702 students enrolled in the writing, public speaking and mathematics courses over the 10 calendar years (see Table 1). 36% of the sample were enrolled in Math, 43.2% in English and 20.9% in Public Speaking. The majority of the students were taught by adjunct instructors (66.5%) vs non-adjunct instructors (33.5%). Examining their grade performance, 66.6% scored in the ABC grade group and 33.4 % were in the “all other grades” group, which included D, F and W. A total of 14.3% students graduated in 4 years, 19.3% graduated in 5 years and 20.7% graduated in 6 years with 45.7% not reporting a graduation in the data set. The ethnicity descriptive analyses showed a majority of White/Caucasian students (82.2%), an ethnically diverse subset of 15% reflecting minorities and international students. A total of 46.7% of the students in the sample (nearly half) reported a low socio-economic status which is a reflection of the region served by our institution.

Table 1. Sample demographics (N = 21274)

Characteristic	N (%)
Sex	
Male	8230 (40.8)
Female	12604 (59.2)
Ethnicity	
White/Caucasian	17485 (82.2)
Black/African American	897 (4.2)
Asian	200 (0.9)
Hispanic or Latino	1214 (5.7)
Native Hawaiian/ Pacific Islander	21 (0.1)
NR-Alien	129 (0.6)
Two or more races	728 (3.4)
Null (No information)	532 (2.5)
Economic standing	
Low SES	9945 (46.7)
Not Low SES	11329 (53.3)
English, Public Speaking, or Math	
Public Speaking (SPCH-S)	4441 (20.9)
English (ENG-W)	9180 (43.2)
Math (MATH-M)	7653 (36)
Grade distribution	
ABC	14167 (66.6)
Rest Grades	7107 (33.4)
Graduation Years*	
4 year graduates	3037 (14.3)
5 year graduates	4099 (19.3)
6 year graduates	4395 (20.7)
Other	9743 (45.7)
Retention to next year	
Retained to next year	12604 (59.2)
Not retained to next year	8670 (40.8)
Retention to next semester	
Retained to next semester	16587 (78)
Not retained to next semester	4687 (22)
Instructor Type (taught by)	
Adjunct instructor	14154 (66.5)
Non-adjunct instructor	7120 (33.5)

*The graduation years' data is cumulative

We conducted a series of Pearson Chi-square tests to answer the research questions (see Table 2). Research question RQ1 explored the relationship in student retention between the students taught by the two faculty groups. To address this question, we conducted two Chi-square tests between the student retention to the next semester and to the next year between the faculty groups. Consistent with other scholarly findings, we found a significant difference in the student retention in both to next

semester ($\chi^2 (1) = 16.722, p < .05$) and to next year ($\chi^2 (1) = 34.17, p < .05$) amongst the student group taught by the adjunct instructors vs non-adjunct instructors. Examination of the observed and expected cell counts indicated that contribution of the adjuncts to the difference in Chi-square was the largest and underlines the importance of implementing institution wide interventions to address this disparity in student retention.

For research question RQ2, which investigated the relationship between graduation rates between the students taught by the two different faculty groups, significant differences were observed in the Chi-square test in each of the 4, 5 and 6 year graduation rates: graduated in 4 years ($\chi^2 (2) = 105.96, p < .05$); graduated in 5 years ($\chi^2 (2) = 74.19, p < .05$); and graduated in 6 years ($\chi^2 (2) = 67.37, p < .05$). Examination of cell counts pointed at the large contribution from the adjunct instructors' group students to the Chi-square significance value. This indicated that the students taking courses taught by adjunct instructors tended to take longer to complete their courses of study.

Research question RQ3, exploring difference in performance, was examined by conducting a Chi-square test between students those who scored A, B or C grade and those who did not. A significant Chi-square ($\chi^2 (1) = 77.304, p < .05$) underlined the difference in performance between the student groups taught by the adjunct vs non-adjunct instructors. Effect size (ϕ) calculations were done for all the Chi-square tests using Cramer's V and a small but significant effect was noted indicating that the type of instructors significantly contributed to the overall differences noted in student retention, graduation rates and performance.

Table 2. Comparison of relevant variables by Instructor type (Adjunct vs Non-Adjunct)

Characteristic	Overall sample	Non- adjunct instructor	Adjunct instructor	Chi square test of independence (p<.05)
Grade distribution				
ABC	14167 (66.6)	4456 (62.6)	9711 (68.6)	$\chi^2 (1) = 77.304$
Rest Grades	7107 (33.4)	2664 (37.4)	4443 (31.4)	$p = 0.000$ $\varphi = 0.06^a$
Retention to next semester				
Retained to next semester	16587 (78)	5668(79.6)	10919 (77.1)	$\chi^2 (1) = 16.722$
Not retained to next semester	4687 (22)	1452 (20.4)	3235 (22.9)	$p = 0.000$ $\varphi = 0.03^a$
Retention to next year				
Retained to next year	12604 (59.2)	4416 (62)	8188 (57.8)	$\chi^2 (1) = 34.166$
Not retained to next year	8670 (40.8)	2704 (38)	5966 (42.2)	$p = 0.000$ $\varphi = 0.04^a$
Graduated in 4 years				
4-Year Graduate	3037 (14.3)	1165 (16.4)	1872 (13.2)	$\chi^2 (2) = 105.955$
Not 4-Year Graduate	14368 (67.5)	4477 (62.9)	9891 (69.9)	$p = 0.000$
Other	3869 (18.2)	1478 (20.8)	2391 (16.9)	$\varphi = 0.07^a$
Graduated in 5 years				
5-Year Graduate	4099 (19.3)	1465 (20.6)	2634(18.6)	$\chi^2 (2) = 74.188$
Not 5-Year Graduate	13306 (62.5)	4177 (58.7)	9129 (64.5)	$p = 0.000$
Other	3869 (18.2)	1478 (20.8)	2391 (16.9)	$\varphi = 0.06^a$
Graduated in 6 years				
6-Year Graduate	4395 (20.7)	1545 (21.7)	2850 (20.1)	$\chi^2 (2) = 67.365$
Not 6-Year Graduate	13010 (61.2)	4097 (57.5)	8913 (63.0)	$p = 0.000$
Other	3869 (18.2)	1478 (20.8)	2391 (16.9)	$\varphi = 0.06^a$
Retaking the course				
Retaken	10031(47.2)	3852 (54.1)	6179 (43.7)	$\chi^2 (1) = 207.420$
Not Retaken	11243 (52.8)	3268 (45.9)	7975 (56.3)	$p = 0.000$ $\varphi = 0.1^a$

φ = effect size (phi coefficient or Cramer’s V). ^a A significant difference with an effect size ~ to Cohen’s definition of “small”

Discussion and Recommendations

Consistent with many other scholars' findings, our data demonstrate significant disparities in student academic performance in General Education courses, retention, and persistence. Unfortunately, this means that most institutions are left to struggle with an apparent contradiction. Employers recognize that part-time faculty do not always attain the same degrees of retention, persistence, or student academic achievement that their full-time colleagues do, but they depend upon the crucial contributions of part-time faculty members, nonetheless. But the discussion should not stop there, nor should the data be used to demean adjunct instructors who contribute to institutions' overall educational objectives. We also acknowledge that there is no direct cause-and-effect formula that will easily resolve this challenge. Yet a key question remains: if institutions are committed to employing part-time instructors, in what ways may available data be used to pursue avenues through which student retention, persistence, and academic performance may be improved? A few possible solutions merit consideration.

First, because there is a relationship between adjunct instructors in General Education curricula and students' struggles with retention, persistence, and performance, one solution is to foster inclusion of adjuncts in development opportunities. At our institution, as with many others, adjunct instructors are sometimes invited to attend conferences and to participate in technical and instructional training, but more could be done to help them develop their teaching skills. Some adjuncts, of course, are at the beginning of their academic careers, and others are experts in their fields but not in the classroom. If an institution can support adjunct instructors with mentoring by full-time faculty, conference registration costs, or instructional workshops, including adjuncts in pedagogical conversations will encourage them to improve their own skills and to support the institution's overall educational mission. While the ability of adjuncts to pursue those opportunities may be varied because of their location or the time they can commit to such enterprises, the presence of part-time faculty members in developmental efforts can only help to maintain high instructional standards.

A second approach to consider relates to the connection between full-time faculty members and student engagement. Not only do some researchers show that adjunct instructors struggle to engage in their institutions, scholarly studies also suggest that when students take courses from adjunct instructors, those students also tend not to be as engaged on their campuses (Childress, 2019; Harrington & Schibik, 2001; Hollis, 2015; Jaeger & Eagan, 2011; Johnson, 2006; Smith, 2010; Tirelli, 1997; Twigg, 1989). Scholars have detailed extensively the importance of supporting student engagement (Bain, 2004; Kuh, 2009; Kuh et al., 2008). Including adjunct instructors in efforts that stimulate student engagement is therefore crucial.

For example, at our institution, adjunct instructors are invited to contribute to our campus' Summer Institute, a program for incoming first-year students. Faculty participants contribute to rich conversations about how to help students adjust to the expectations of higher education, and their efforts strive to ease the challenges that students face, fostering an atmosphere that encourages their engagement in the campus culture and in their own learning processes. Adjunct instructors' participation in this enterprise is another means by which we strive to offset the disparity in outcomes between full-time and part-time faculty on our campus. Small steps like these should help to bolster adjunct instructors' skills and may support their integration into a campus culture that fosters and celebrates quality instruction. An initial survey of the data considered student retention by comparing Summer Institute attendees to a similar group of students who did not participate in the program, finding that retention was significantly higher for those who attended. While further analysis is needed, individual programs like ours provide some evidence that such efforts are worthwhile. In fact, the campus director of the Summer Institute says "controlling for typical factors that would contribute to retention outcomes ([high school] GPA, expected family contribution as a corollary for income, etc.)

this program had a positive impact” (Christina Downy to Chris Darr, personal communication, June 17, 2021). Encouraging part-time faculty to be part of an institutional culture that values all contributions to student success is key.

There is one more possibility that may bolster the approaches that we (and other campuses) have implemented. A final important option is to consider the strategic employment of full-time faculty. On first glance, the stark contrast between a full-time salary (with benefits) and the modest compensation offered to adjuncts may make this feel like a fool’s errand. But a great deal more is at stake. Since full-time faculty employment appears to correlate strongly to improved student performance, retention, and on-time graduation, administrators should examine cumulative data in those areas to identify the areas in which students experience higher rates of problematic outcomes so that strategic hiring of full-time faculty might be implemented. Not only would an institution fulfill its educational promises to a greater number of students, but there may be additional benefits that come from this approach.

For example, many institutions receive performance-based funding for achieving improvements in such factors as graduation rates, persistence benchmarks, and so on. Our institution receives performance funding for improving a number of metrics, including our four-year graduation rate. The funding formula is based on increasing the three-year averages of on-time (4-year) degrees awarded. In the 2019-2021 biennium, \$1,161,864 in performance funding was awarded to our campus by the state based on a comparison of two three-year periods: 2012-2014 and 2015-2017 (Indiana Commission for Higher Education, 2021). This resulted in a funding increase of \$576,639 in 2019-20 and \$585,225 in 2020-21 as a result of our gain of 27 graduates (on average) in the on-time graduation rate metric. Put another way, every three additional on-time degrees awarded in the second three-year period (2015-2017) would have increased the average gain by one on-time graduate, thus resulting in an additional \$21,357 in funding for our campus. Regardless of whether or how state funding impacts other campuses, improvements in retention and student performance may provide increases in tuition revenue that are worth pursuing. Under these guidelines, the financial incentives for improving on-time graduation are clear and significant. Our analysis suggests that since four-year graduation rates are tied to instructor status, hiring additional full-time faculty may—under the right circumstances—pay for itself.

For the extensive survey that our data provided, the results seem to suggest reasonable conclusions about students’ ongoing academic progress. Students who work with full-time faculty tend to enjoy greater promise in terms of retention, persistence, and on-time graduation. If the data is that clear, then administrators could pursue an innovative mix of strategies, such as those outlined above. Academic administrators could identify disciplines in which students seem to struggle the most and employ full-time instructors when the data supports that conclusion. As well, full-time positions may—or may not—be permanent appointments. Visiting roles (such as Visiting Lecturer or Visiting Assistant Professor) would provide an appointment in which the instructors can commit more fully to a single campus’ instructional culture and the student engagement that goes with it. As well, short-term full-time appointments permit administrators some flexibility. If student outcomes improve in one discipline, academic administrators may use the ongoing results to suggest areas in which a different position may be warranted. It should be recognized that this is not an easy tit-for-tat process. Hiring individual instructors or including adjuncts in innovative retention efforts will not automatically guarantee the results envisioned here. After all, there are many factors that contribute to individual students’ retention and academic performance, and adjunct instructors are neither the direct cause nor the sole explanation for those difficulties. Nonetheless, while much of the available research only notes the differences in academic performance, retention, or persistence, additional work is needed to ameliorate those disparate outcomes.

Limitations and Conclusion

While our data were extensive and our statistical analysis found significant differences between adjunct-taught students and permanent faculty-taught students, our study has some limitations. The data set we collected did not include several variables that may have influenced our findings, such as class standing (freshman, sophomore, junior, senior), or personal factors beyond SES that may help to contextualize the results. And while we did collect data on SES status (yes or no), more information on factors like financial or student aid details could provide additional clarity to the relationship between students' financial status and their overall academic success. Additionally, students appear in our 21,274 data points more than once, as they are required to take courses in all three general education categories we examined. For instance, a student who graduated in four years would appear in our data set at least three times, as they would need to take a public speaking, writing, and mathematics course. Additionally, some students repeat courses due to withdrawal, failure, or other factors. Also, we did not track factors like faculty development, such as participation in workshops or other training opportunities. Future studies might track whether adjuncts take advantage of opportunities like teaching workshops or mentoring opportunities, and should consider how (or whether) development activities for faculty members encourages positive change in student academic outcomes.

This study shows that there is good reason for institutional administrators to consider the disparate results between adjunct and full-time faculty in General Education courses. Our data results demonstrate that there were significant differences in student academic outcomes based upon the type of instructor from whom they took General Education courses. In what ways can institutions use the available data to pursue improvements in retention, persistence, and on-time graduation? We believe that the challenge lies less in the availability of data. Instead, it is important to consider how data is used to monitor progress. For example, institutions routinely collect data that records student retention, persistence, and academic performance. However, some do not acknowledge the differences between adjunct instructors' results compared to full-time faculty. Without penalizing adjunct instructors for those disparities, paying close attention to the numbers may suggest avenues for improvement. As well, the numerical data do not always indicate the reasons for challenges in the areas we studied. For that reason, we suggest that routine student surveys be implemented to better understand the ways in which students' experiences lead them to drop out or to struggle academically. Similarly, the National Survey of Student Engagement (NSSE) may be used to keep track of student perceptions about institutional efforts. While anecdotal data should not dictate any campus' approach, student feedback is crucial to understanding and contextualizing data trends.

We recognize that our examination of these trends is incomplete and is better characterized as suggestive rather than conclusive. To build upon these initial findings, additional research will help to explain student challenges with the academic outcomes discussed here, and to investigate other solutions. For example, the role of so-called bridge programs in bolstering student engagement and success merits further consideration. What would happen if more adjunct instructors were included in those early efforts with entering students? As well, scholars might consider in greater depth the role of any campus' instructional culture. Does institutional training for full- and part-time faculty respond effectively to students' lack of engagement and other academic challenges?

Another factor our study did not consider was the 30, 60, and 90 credit hour benchmarks that often play a part in our state's higher education funding formula. While retained students are obviously making progress toward these markers, future data collection by our campus should examine these data specifically in order to refine the findings that those results suggest. Similarly, we recommend that any institution undertaking an analysis of factors related to adjunct instruction fully examine available data that is directly related to any state funding formulas. While there are many ways in which

available research can go farther, our data seems suggestive enough to encourage other scholars to continue to investigate these crucial components of academic hiring and student academic success.

We have surveyed here a common experience found on many college campuses. General education courses taught by part-time instructors on average experience higher rates of problematic student outcomes than do the courses taught by full-time faculty. This study encompassed nearly a decade of student results in three academic disciplines. Other academic units were omitted from this study to ensure that data was depersonalized. Going forward, campuses should consider all available data to identify and act upon the areas in which students struggle the most. As well, academic administrators should consider strategic hiring of full-time faculty. Not only will this benefit overall student outcomes, but it may also provide a boost to campus' financial bottom line. We can do better by our academic colleagues and our students by including part-time faculty in some efforts that foster student persistence and academic success. We all benefit when students do better.

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