Student Analytics and Research

SAReport

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FLORIDA STATE COLLEGE AT JACKSONVILLE™

Introduction

How are a student's course load, Grade Point Average (GPA) and term-to-term persistence related? Answering this question is of practical importance for many including students, parents, advisors, college administrators, and others.

According to Szafran (2001), both students and advisors need this information to make better first and second semester scheduling decisions. Parents or those who assist in paying for a student's education have obvious interest. College administrators are concerned with student retention, persistence, and overall academic success. And, according to Szafran (2001, p. 28), the answer to this question "…has recently become of interest to state legislatures and the public concerned with the length of time students are taking to complete their college degrees."

Intuitively, and with all other things "equal," it may seem that students who take more credit hours per term risk lowering their semester GPA simply due to "overload" or the lack of time necessary to maximize their course grades. After all, compared to their higher credit load counterparts, students who take less credit hours should have more time to spend per course to achieve higher grades. On the other hand, the higher course load group may consist of full-time students who are more engaged, committed, or dedicated to their studies compared to their lighter course load (part-time) counterparts. Fortunately, research is able to provide additional guidance.

Prior Research

In studying the relationship between student course load and grade point average in a university setting, Shami and Ansar (1980) defined three groups of students based on credit load. These consisted of those who took less than 11 credit hours, 12 to 17 credit hours, and 18 or more credit hours. In presenting separate findings across six different departments, the researchers found statistically significant differences in GPA by course load for the three groups. According to the authors, "As the credit loads of the students increased, their mean GPAs also increased." The authors suggest the results "may indicate that the subjects did not exceed the optimum course load, or that students who have high GPAs tend to take more courses" and concluded that additional research was needed. In a follow-up study Khouj, Mohammad, Ansar, and Shami (1982) defined three groups in terms of students taking (a) 13 to 14 credit hours, (b) 15 to 16 credit hours, or (c) 17 to 18 credit hours. The authors found significant differences between the mean GPAs of all three course load categories concluding "that as the course loads increase, GPAs also increase" reinforcing findings from their previous study.

Finding survey evidence "that freshmen who took higher course loads tended to have higher GPAs," Duby and Schartman (1997) suggested that a higher credit load may impact GPA because it represents a student's commitment to academics relative to other time consuming activities such as work or family. Furthermore, an advisor's recommendation that a student take a lighter academic load may be perceived by the student as a judgment about their academic ability and may function as a self-fulfilling prophesy.

In looking at the effect of academic load on success for new college students, Szafran (2001) explored the specific relationship between course load and GPA. Using a systematic random cohort sample of n = 512 of new (entering) students, and variables that included credit load, GPA, and course difficulty, Szafran employed correlation, regression, and two-way ANOVA (to analyze possible interactions between credit load and course difficulty). He found that "students who register for more credits tend to earn higher GPAs and have greater retention even after controlling for academic ability, prior academic success, on-campus employment hours, and other background characteristics" (Szafram, 2001, p. 27).

In summary then, prior research findings support a positive association between course load and GPA. When viewed against the larger landscape of student degree completion, such findings also support Adelman's (2006) discussion of "academic momentum" in terms of the importance of earning at least 20 credits during the first academic year of enrollment (e.g., via continuous enrollment including the summer term), as well as student "…effort required to yield a rising GPA…" (Adelman, 2006, p. xxiv).

FSCJ Research

To investigate local results, the FSCJ Office of Student Analytics and Research examined associations between student credit load and two key measures of student success: (1) GPA and (2) term-to-term student persistence.

GPA and Credit Load

To examine relationships between both GPA and term-to-term persistence, a sample cohort of n = 1,384 recent high school graduates who enrolled at FSCJ in the Fall 2013 term for college credit courses was defined. Cohort student progress and performance was compared in and across the Fall 2013, Spring 2014, and Fall 2014 academic term(s). Students in the cohort included both former dual-enrollment and First Time in College (FTIC) students. [i]

Full-time students are defined as those taking at least 12-credit hours per term. **Table 1** is a three term cross-tabulation of FSCJ cohort student GPA by load status (full-time or part-time). **As shown, *all* full-time GPAs are significantly higher compared to part-time GPAs.** In Fall 2013 the average GPA for 521 full-time students was 2.70 compared to 2.46 for 853 part-time students. In Spring 2014 the average GPA for 543 full-time students was 2.66 compared to 2.20 for 581 part-time students. In Fall 2014 the average GPA for 405 full-time students was 2.79 compared to 2.34 for 475 part-time students.

Table 1. GPA by course load in terms of full-time or part-time student status [ii]

	Fall 2013 Load Status				Spring 2014 Load Status				Fall 2014 Load Status			
	full-time		part-time		full-time		part-time		full-time		part-time	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Fall 2013	2.70_a	521	2.46_b	853								
Spring 2014					2.66_a	543	2.20_b	581				
Fall 2014									2.79_a	405	2.34_b	475

Note: Values in the same row and subtable not sharing the same subscript are significantly different at p< .05 in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances.1

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

In addition to comparisons based on load status, average (mean) GPA comparisons were also done based on the total number of academic terms (out of three possible) that a student enrolled. Of the total cohort consisting of 1,384 students who enrolled in Fall 2013, 170 had a GPA in only that term. Their average GPA was 1.55. In contrast, 377 students had GPAs in two terms and their (two-term) GPA average was 1.96. The average for 837 students with GPAs in all three terms was 2.72. These results are summarized in **Figure 1** indicating a positive relationship between continuous enrollment and average student GPA: **Students continuously enrolled also have the highest average GPA.**

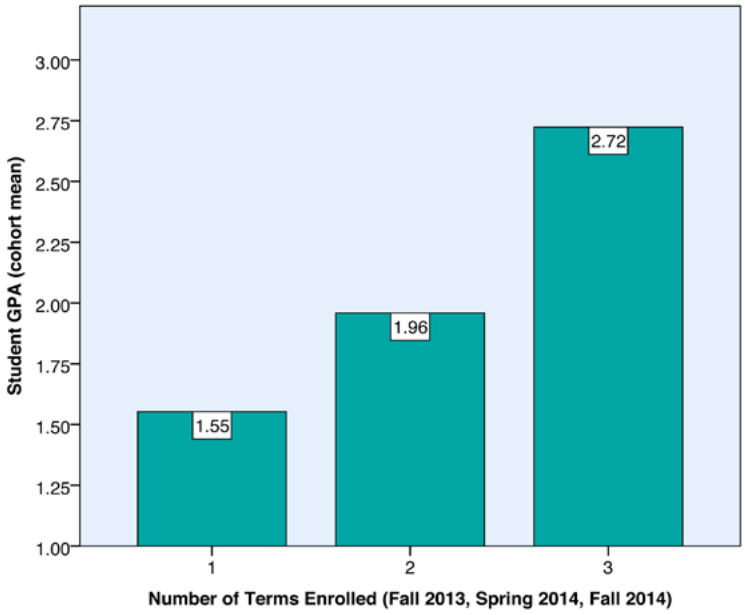

Figure 1. Average GPA by total number of terms enrolled. All GPA mean differences are statistically significant ($p < .05$). Cohort n = 1,384. Bar insets show mean GPA of students enrolled in 1 (of three), 2 (of three), or all 3 (of three) terms.

Term-to-Term Persistence & Credit Load

Student Average Course Load[iii] was also compared against the number of terms a student was enrolled as a measure of term-to-term persistence. As with GPA, the results show statistically significant increases in Average Course Load (ACL) with increased persistence from one, to two, to three terms.[iv] **In other words, students with higher levels of persistence also tend to have a higher average course load. Table 2** compares both ACL and GPA by the number of terms a student was enrolled. As shown, student ACL increased significantly from 7.83 credit hours for students who persisted only one term, to 10.18 hours for students who persisted all three terms. **GPA increased significantly from 1.55 for students who persisted only one term, to 2.72 for students who persisted all three terms.**

Table 2. Comparison of average course load and student GPA by number of terms enrolled

	Number of Terms Enrolled							
	1		2		3		Total	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Average Course Load	7.83_a	170	8.69_b	377	10.18_c	837	9.49	1384
GPA	1.55_a	170	1.96_b	377	2.72_a	837	2.37	1384

Note: Values in the same row and subtable not sharing the same subscript are significantly different at $p < .05$ in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances.1

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

GPA and Actual Credit Hours

In addition to comparisons based on full-time or part-time enrollment status, the relationship between the *actual* number of credit hours taken by students and their GPA was also compared.[v] Based on Fall 2013 results, significant GPA differences were found at 6 credit hours. The average GPA for 440 students who took 6 or less credit hours in Fall 2013 was 2.34 compared to 2.65 for 934 students who took more than 6 hours.

Using Spring 2014 results, significant GPA differences were found at 11 credit hours. The average GPA for 581 students who took 11 or less credit hours in Spring 2014 was 2.20 compared to 2.66 for 543 students who took more than 11 hours **(Table 3)**. This comparison also happens to exactly match the results shown in Table 1 because the credit load level occurs at 11 hours (which is very close to the 12 hour load level used to operationally define full-time students).

Table 3. GPA comparison based on actual credit hour load

Actual Credit Spring 2014	Grade Point Average
11 or less	2.20
12 or more	2.66

Using Fall 2014 results, three significant credit hour groups were revealed. The mean GPA for 221 students taking less than 8 hours was 2.14. The mean GPA for 254 students who took between 8 and 11 credits was 2.51, and the mean GPA for 405 students who took more than 11 hours was 2.79. Note, this last result again matches the results shown in Table 1 for full-time students.

Conclusion

The results for the cohort of students analyzed for this report agree well with the findings of published research on the topic of student GPA and course load. FSCJ student course load and GPA are positively associated meaning that students with higher average course loads tend to also have higher average GPAs. Furthermore, students who persist at higher levels (e.g., those who consistently enroll each term over an extended period) also tend to have a higher average course load compared to those who do not. Finally, as suggested by the literature and the additional analyses discussed, many other factors are in play.[vi] Additional research is required to fully explore and capitalize on these less obvious, more complex, relationships. The results of such research would be most helpful to students, advisors, and others in terms of guiding overall student progress and success, as well as benefits to the College service area and society beyond.

References

Adelman, C. (2006). The toolbox revisited: Paths to degree completion from high school through college. Washington, D.C.: U.S. Department of Education.

Duby, P., & Schartman, L. (1997). Credit hour loads at college onset and subsequent college performance: A multi-institution pilot project. In Annual Forum of the Association for Institutional Research, Orlando.

Herzog, S. (2006). Estimating student retention and degree-completion time: Decision trees and neural networks vis-á-vis regression. New Directions for Institutional Research, 2006, 17-33.

Mendez, G., Buskirk, T. D., Lohr, S., & Haag, S. (2008). Factors Associated With Persistence in Science and Engineering Majors: An Exploratory Study Using Classification Trees and Random Forests. Journal of Engineering Education, 97, 57-70.

Shami, A., & Ansar, M. (1980). Relationship of Students' Course Loads with Their Grade Point Average Scores. (ERIC ED202441)

Szafran, R. F. (2001). The effect of academic load on success for new college students: Is lighter better? Research in Higher Education, 42(1), 27-50.

Thomas, E. H. & Galambos, N. (2004). What Satisfies Students? Mining Student-Opinion Data with Regression and Decision Tree Analysis. Research in Higher Education, 45, 251-269.

Zakir Khouj, A. M., Shami, A., & Ansar, M. (1982). Relationship of Students' Course Loads with their Grade Point Average Scores, Study II: An Occasional Paper. (ERIC ED219004)

End Notes

i The population for the sample consisted of 3,524 FSCJ service area (i.e. Duval and Nassau Counties) high school graduates who graduated in May-June 2013. Although only three academic terms were examined, a total of 66 students were found to have completed an A.A. (e.g., through dual enrollment) within five academic terms of HS graduation (20133, 20141, 20142, 20143, and 20151). Of this population, 1,384 (39.3%) enrolled at FSCJ in the Fall 2013 term (20141). Of this total entering cohort, 580 (41.9%) were former dual-enrollment students, and 804 (58.1%) were First Time In College (FTIC) students. Notes—Compared to the total cohort, 1,374 students had a GPA in the Fall 2013 term. Term-to-term GPA calculations exclude relatively small numbers (<20) of students that enrolled in the term, but subsequently withdrew from their classes.

ii Note—while not shown in the table, for 450 cohort students classified in Fall 2013 as full-time and returning in Spring 2014 the average GPA was 2.68 compared to 2.26 for 681 students classified in Fall 2013 as part-time. Similarly, for 368 cohort students classified in Fall 2013 as full-time and returning in Fall 2014 the average GPA was 2.71 compared to 2.42 for 517 students classified in Fall 2013 as part-time. The Fall 2013 GPA of 546 students classified as full-time in Spring 2014 was 2.99 compared to 2.47 for 594 students classified as part-time in Spring 2014. For 439 students classified as full-time in Spring 2014 the average Fall 2014 GPA was 2.73 compared to 2.45 for 383 students classified as part-time in Fall 2014. The Fall 2013 GPA for 406 students classified in Fall 2014 as full-time was 3.12 compared to 2.60 for 484 students classified as part-time in Fall 2013. The Spring 2014 GPA for 402 students classified as full-time in Fall 2014 was 2.94 compared to 2.45 for 425 students classified as part-time in Fall 2014.

iii For example, the average course load for a student who took 6 credit hours per term and completed three terms (e.g., Fall, Spring, Fall) would be 6 hours, i.e., 18/3 = 6.

iv The two variables, Average Course Load and Number of Terms Enrolled, are also significantly correlated (Pearson r = 0.285, $p < .001$).

v Chi square Automatic Interaction Detection (CHAID) analysis was used. This statistical technique has been well documented in educational research (see references).

vi While all of the results presented suggest a consistent positive association between course load and GPA, not surprisingly many other variables can also be associated with and/or predictive of student GPA. In addition to course load, other GPA predictors were also explored using CHAID. Along with the number of credit hours, student date of birth (DOB), gender, zip code, student race/ethnicity, Fall 2013 Program of Study, high school name, high school diploma type, and dual enrollment history were also used. Using the average Fall 2014 GPA (2.54) for 885 students as a target, this technique revealed a subset of 405 students who took over 11 credit hours to have an average GPA of 2.79 (as described above). Of these students, a further subset of 194 students from 18 particular zip codes had an average GPA of 3.05, and a further subset of 86 dual enrollment students had the highest average GPA of 3.25.

Further Information

The comprehensive 2013-2014 Edition of the College Fact Book (FACTOR) is currently available on FSCJ's website at http://www.fscj.edu/discover-fscj/about-us/. The 2014-2015 Edition of FACTOR (scheduled for publication fall of 2015) will provide additional summaries, analyses, and comparisons. For additional information or research requests, please contact Student Analytics and Research.

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Disclaimers