The Impact of Internship Credits On Student Success Varies Across Schools

Samantha Flores, Rachel Kudlacz, Darcie Nelson, Germaine Ng

University of Washington Bothell

Abstract

This quantitative research study explored the relationship between exit grade point average (GPA) and the amount of internship credits taken. There was no knowledge examining the students at the University of Washington Bothell (UWB). Our group was interested in if there was, if any, a correlation between the amount of credits taken and the exit GPA of undergraduate students. Therefore, by examining the data around high-impact practice participation (HIP), provided by the University, we were able to create a visualization that demonstrates our findings. The data included undergraduate students at UWB who received internship credits and their exit GPA for each school within the university. Our findings include the school of IAS and Business where the relationship between the two variables was clear. Our visualization shows that in the school of business at UWB, the students who took internship credits had a lower exit GPA. While the students in the school of IAS had a higher GPA.

Keywords: students, high-impact practices, internships, United States of America

The Impact of Internship Credits On Student Success Varies Across Schools

The Career Services department at the University of Washington Bothell (UWB) defines internships as "a short term opportunity to provide practical experience in an occupation or career field" (University of Washington Bothell, 2019a). As students in the School of Interdisciplinary Arts and Sciences (IAS) at UWB, we are curious as to how beneficial internships are to us, as our skills relate to a variety of fields. While looking into the different types of internships available through job networking sites such as Handshake and LinkedIn, we noticed that the titles of many of these internship positions specifically targeted STEM and business majors. Although this was our initial reaction, we have yet to confirm whether or not internships are distributed equally across departments, especially in relationship to the schools at UWB. To address this gap in understanding, we will be looking into internships taken across the departments and students' exit grade point average (GPA) upon graduation for any possible correlation.

Preliminary research showed that internships are one of ten high-impact practices (HIP) established by the Association of American Colleges and Universities (Parker III, Kilgo, Sheets & Pascarella, 2016). Obtaining an internship prior to graduation does indeed have an impact on employment opportunities for students (Callanan & Benzing, 2004). The statistics behind internships presented some intriguing facts: people of color are less likely to get internships; there was no difference in the internship rate between men and women; students who obtain internships tend to not only have higher GPAs and graduation rates, they also tend to be younger or graduate slightly sooner than those who do not do internships (Gault, Redington, & Schlager, 2000). In contrast to our original assumption, we discovered that business majors did not actually have a better chance at getting an internship over other majors (Knouse, 1999). The study found

that while students who had internships tend to find jobs quickly upon graduation, that advantage disappears after six months. So there is a short window of advantage over other students. On top of this, we found a study that discussed how high-impact classes are widely used and accepted as a measure of student success, yet students do not necessarily take part in them (Johnson, 2018). We do not know, however, how this pertains to students at UWB, specifically if internship credits are predictive of a higher GPA.

Therefore, we ask the following research question: How do internship credits relate to the exit GPA of undergraduate students across schools at the University of Washington Bothell? By addressing this question we can analyze the data provided and compare it to the research that has already been done about the success rates of students who participate in internships to fill our gap in knowledge.

Methods and Materials

Data Summary

The data used in this study is from research done on high-impact practices (HIP) from the Global Initiatives program at the University of Washington, Bothell (UWB) campus. The data set includes HIPs such as Community-Based Learning Research (CBLR), Fieldwork, Internships, Study Abroad, Undergraduate Research, Capstone, Practicum, and Collaborative Online International Learning (COIL). In addition to transfer status and major, the student variables consist of identifying information such as ethnicity, gender, first-generation college student, and class standing.

There are 2139 students in our sample. We will use the following data from the HIP worksheet of the “INC-376 High Impact Practices-Student Success” file: CareerLevel [UG only], Internship.Credits [one credit and above selected], and Exit GPA. The data for School is taken

from the "Compiled HIPs, one spreadsheet 3" file. Regarding data type: Career Level and School are categorical; Internship Credits and Exit GPA are interval.

We will look at exit GPA and internship credits to determine the correlation, if any, between students' exit GPA with their quantity of internship credits. Each student's exit GPA measures the overall average score students have once they leave UWB. We are making the assumption that the higher the GPA, the harder a student may have worked to earn that grade, thus measuring success. As each school has different requirements, we will analyze the data of each department to increase the accuracy of the outcome.

There are some missing data in section "UWBCareerLevelDegreeQtr", "TimeToDegree(Yrs)", "TimeToDegree(Yrs)" etc. However, there is no missing data from the data set we will be using.

Analytical Approaches

In order to address the research question, how do internship credits relate to the exit GPA of undergraduate students across schools at the UWB, we will analyze if students' participation in internships impacted their exit GPAs. From there we will be conducting a comparison of these variables across the different schools offered at UWB.

To conduct our test and analysis, we will use the lm() function in the stats package for R (R Core Team, 2019) to calculate a linear regression and test the correlation between students' internship credits and exit GPA. One component of linear regression is whether or not an independent variable can predict the outcome of a dependent variable, and if so, how strong the relationship is between them. Using the formula $\boldsymbol{y = b + ax}$, where $\boldsymbol{y}$ is the student's exit GPA and $\boldsymbol{x}$ is the number of internship credits, the value of the regression coefficient $\boldsymbol{a}$ will determine the strength of the relationship: if $a > 0$, there is a positive correlation, if $a < 0$ there is a negative

correlation, and if a = 0, there is no correlation between the variables. The regression coefficient is the slope of the regression line, which passes through the mean values of the ***x*** and ***y*** variables.

The linear regression test is appropriate because it is used to "visualise the linear relationship between the predictor and response" (Machine Learning Plus). Each school will have its own code for the test rather than one across all the departments. We will use a scatter plot to demonstrate if there is a negative, positive or no correlation between internship credits and exit GPA. This method will help us see the connections in a more explicit way, which is exactly what we're looking for. Additionally we also used the Pearson's Product-Moment Correlation to more specifically define the relationship between our two continuous variables through the p-value (Stat Direct). If the p-value is less than 0.05 this means the pattern is less likely to be explained by a change, making it significant. On the other hand if the p-value is greater than or equal to 0.05, then it is not significant.

Results

To address our research question, is there a relationship between the amount of internship credits and GPA, we analyzed the data of each school at UWB. Figure 1 displays a series of scatter plot graphs indicating the students who participated in internships and their GPA post graduation. Contradicting our initial belief, our linear regression test indicates that there is not a direct relationship between the amount of internship credits and exit GPA across the board.

After taking their internships, the overall average GPA for Business students taking 3.41 internship credits decreased by 0.0071 points per credit, whereas the overall average GPA for IAS students taking 3.29 internship credits increased by 0.021 points per credit. In other words, our results indicate that if both an IAS major and Business major were to take 10 internship

credits, the IAS major could expect a 0.21 increase to their GPA whereas the Business major could expect a 0.071 decrease to their GPA.

Figure 1 also indicates that there was not a positive trend ($a < 0$) between internship credits and exit GPA amongst Business students. In the case of IAS students there is a slight positive correlation ($a > 0$) between the two variables. As stated previously, the amount is not enough to confirm any correlation, thus there is not a direct relationship (a = really close to 0).

The results of our Pearson's Product-Moment Correlation further support this point. Between exit GPA and internship credits, Business students had a p-value of 0.3328 and IAS students had a p-value of 0.01319. The p-value for business students is greater than 0.05, indicating no statistical significance, whereas the p-value for IAS students is less than 0.05, indicating there is a statistical significance. We decided to only display data for the Business and IAS departments in our visual, as the data for other UWB departments appeared scattered, suggesting there was not enough student participation to make any relevant correlations among these groups.

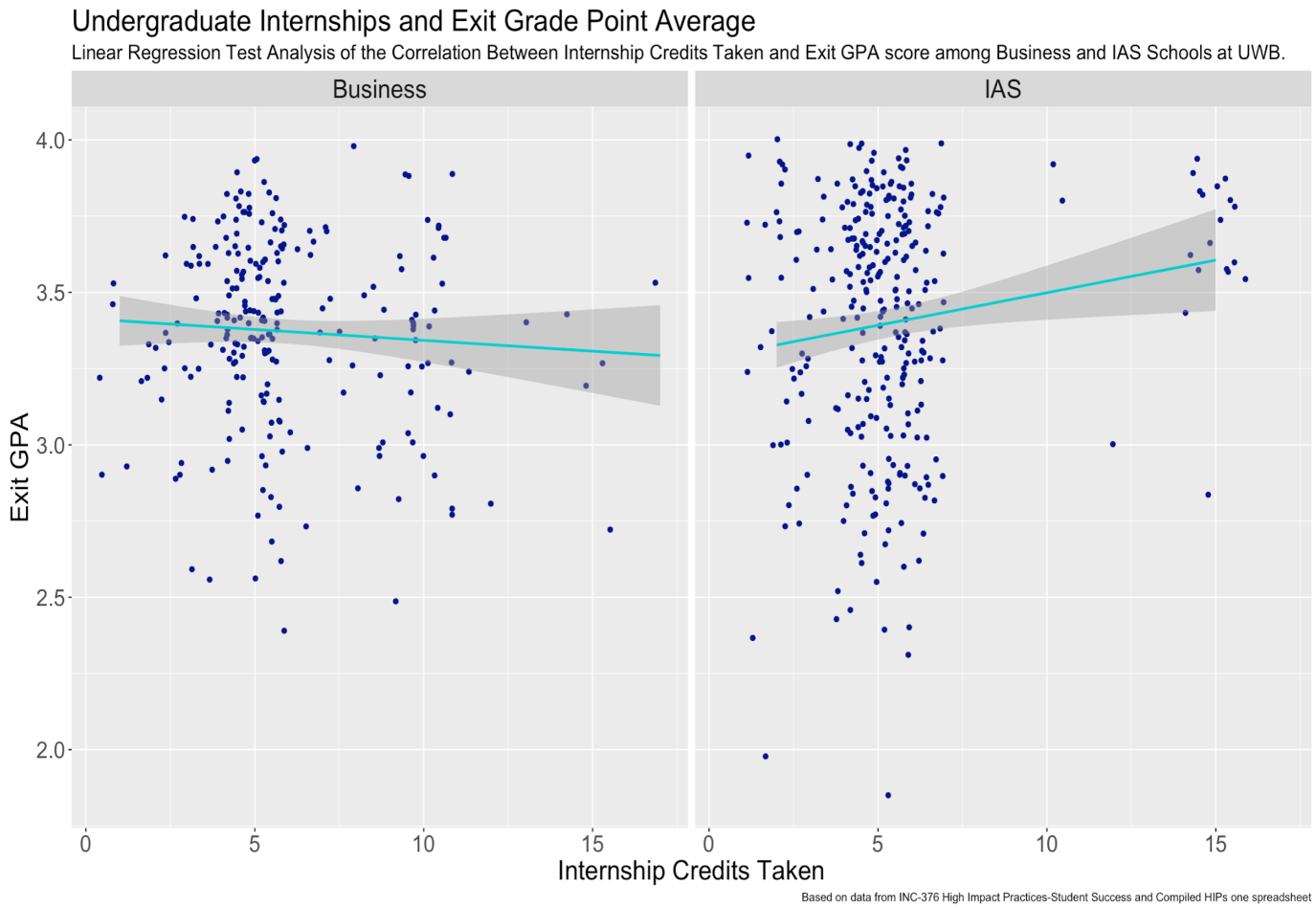


Figure 1 shows the correlation between internship credit taken and exit GPA score among school of Business and IAS at UW Bothell. The grey area behind the line indicates the 95% confidence interval which show the range of the line could be based on errors.

Discussion

With the intentions of coming to a better understanding on how internships relate to us as IAS students, we explored the correlation between internship credits taken and student's exit GPA across the departments offered at UWB. We initially assumed that mostly STEM and Business students would participate in internships versus students in IAS, Education, and Nursing & Health Studies because many job search engines such as LinkedIn, Handshake, and

Glassdoor had shown us that a majority of the positions offered addressed specific majors in the prior departments.

However, through looking at the data of student participation in internships at UWB, we found that a surprisingly large population of students in IAS completed internships while performing well academically. As for the other departments, we did not expect to see that there is a significantly lower number of STEM student participants than that of Business and IAS students. In regards to the school of Educational Studies (University of Washington Bothell, 2019b), it is important to point out that we are missing data from that fraction because these students participate in "fieldwork" as opposed to internships. The same can be said for students in Nursing and Health Studies as they are also required to participate in health field work (University of Washington Bothell, 2019c).

Another factor that we did not take into consideration are internships taken outside of class credit, in other words outside school or even perhaps outside of state. This could possibly explain the discrepancies between STEM, IAS, and Business as the latter two have clear classes that cover internship credits (University of Washington Bothell, 2019d & 2019e) whereas STEM students do not (University of Washington Bothell, 2019f). More qualitative nuances such as these are not as easy to find within the data, and we are limited in this aspect as we are unsure what questions were asked to give us the information we have.

Regardless of all this, there are still some misunderstandings regarding pre-major students and how they can have an exit GPA. Our current assumption is that these students are transfer students, either coming in or leaving, who participated in internships prior their transfer at UWB or elsewhere. Also regarding our limited time and knowledge, we were unable to separate students who were double majors as we remained broadly analyzing the departments.

Perhaps we could have received more nuanced insight to the benefits of taking an internship for students through analyzing the majors and how each gains more or less from participating in internships.

Through future research and deeper analysis of the data at hand, there is potential to better understand the role that internships play for specific majors and whether that correlates with students' concerns for relevant opportunities or university concerns for student retention. For example, exploring the relationship between students transferring out of UWB their sophomore year and internship opportunities, to see if this is a factor to why a student may stay at a specific school or move to schools in certain areas.

References

Callanan, G., & Benzing, C. (2004), "Assessing the role of internships in the career‐oriented employment of graduating college students". *Education + Training, 46*(2), 82-89. doi.org/10.1108/00400910410525261.

Gault, J., Redington, J., & Schlager, T. (2000). Undergraduate Business Internships and Career Success: Are They Related? *Journal of Marketing Education, 22*(1), 45-53. https://doi.org/10.1177/0273475300221006.

Johnson, S. R., & Stage, F. K. (2018). Academic Engagement and Student Success: Do High-Impact Practices Mean Higher Graduation Rates? *Journal of Higher Education*, *89*(5), 753-781. https://doi.org/10.1080/00221546.2018.1441107.

Knouse, S. B., Tanner, J. R., & Harris, E. W. (2011). The Relation of College Internships, College Performance, and Subsequent Job Opportunity. *Journal of Employment Counseling*, *36*(1), 35–43. https://doi.org/10.1002/j.2161-1920.1999.tb01007.x

Linear Regression - A Complete Introduction in R with Examples. (2019, October 22). Retrieved October 30, 2019, from https://www.machinelearningplus.com/machine-learning/complete-introduction-linear-regression-r/.

Parker, E.T., III, Kilgo, C.A., Sheets, J.K.E., & Pascarella, E.T. (2016). The Differential Effects of Internship Participation on End-of-Fourth-Year GPA by Demographic and Institutional Characteristics. Journal of College Student Development 57(1), 104-109. doi:10.1353/csd.2016.0012.

R Core Team (2019). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

University of Washington Bothell. (2019a). Internships. Retrieved from https://www.uwb.edu/careers/jobs-and-internships/internships

University of Washington Bothell. (2019b). Educational Studies. Retrieved from https://www.uwb.edu/educational-studies/completion-requirements.

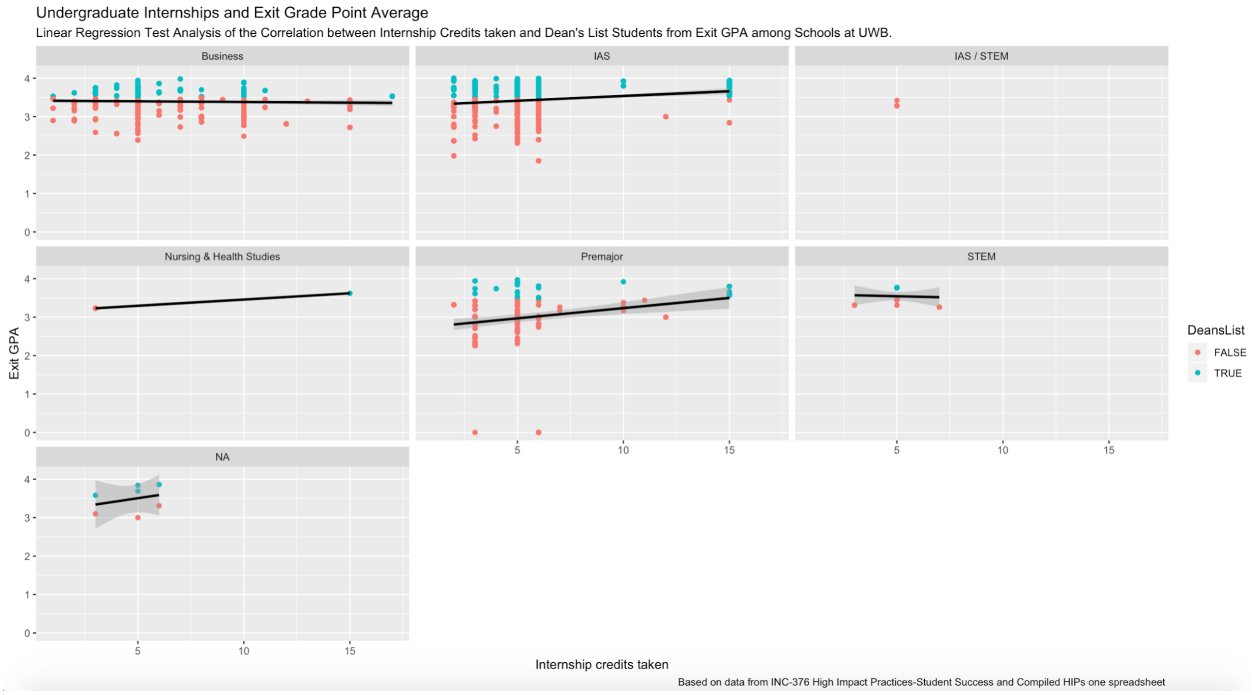
University of Washington Bothell. (2019c). Health Studies. Retrieved from https://www.uwb.edu/healthstudies/degree-req.

University of Washington Bothell. (2019d). BIS 495 IAS Internship Course. Retrieved from https://www.uwb.edu/ias/undergraduate/experiential/internships

University of Washington Bothell. (2019e). Internships and Student jobs. Retrieved from https://www.uwb.edu/babusiness/bothellcampus/intern-jobs

University of Washington Bothell. (2019f). Capstones & Internships. Retrieved from https://www.uwb.edu/stem/industry-engagement/capstones-internships

Appendix A
Undergraduate Internships and Exit Grade Point Average Across All Schools at UWB



Appendix B

Table B1

Coefficient of School of Business and IAS

	Business	IAS
(Intercept)	3.413839348	3.28500155
Internship.Credits	-0.007116145	0.02139045