Curriculum? Shmurriculum! The Relationship Between Major Curriculum Characteristics and First-Year Earnings for Information Systems Graduates

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Abstract

This paper provides the results of an empirical investigation comparing first-year earnings of IS graduates to other business majors and examining the extent to which characteristics of the major curriculum affect first-year earnings of IS graduates. The analysis combined first-year earnings data for almost 7,000 IS graduates across 128 universities obtained from the U.S. Department of Education with major curriculum characteristics obtained from the universities' websites. Results show that IS graduates have the highest first-year earnings among business majors. Interestingly, neither the total number of IS major credits, the total number of IS core and elective credits, nor the number of subject-level IS core credits affect first-year earnings of IS graduates after accounting for state median income and university ranking. Thus, the IS major curriculum at a university does not seem to affect first-year earnings at all. Based on the findings of this study, applicants wishing to maximize their first-year earnings should choose IS as their major and study at a university with a high ranking located in a state with a high median income.

Keywords: First-year earnings, information systems, curriculum characteristics

1. INTRODUCTION

With rising college tuition and fees, increasing student-debt, decreasing state funding, and growing sentiment among legislators and the general public about the worth of a four-year college education (EDUCATIONDIVE, 2019; Dann, 2017; Task Force on Apprenticeship Expansion, 2018), first-year earnings among Information Systems (IS) graduates becomes an important topic for IS educators to carefully consider. Given the goal of the Promoting Real Opportunity, Success, and Prosperity through Education Reform (PROSPER) Act (2017), which is "to support students in completing an affordable postsecondary education that will prepare them to enter the workforce with the skills they need for lifelong success" (H.R. 4508, 2017, p. 1) along with the push toward Science, Technology, Engineering, and Mathematics

(STEM) fields (U.S. Department of Education, STEM, n. d.) an applied discipline such as IS is in a prime position to provide students the necessary skills and financial means for achieving lifelong success. As such, the purpose of this paper is four-fold. First, it compares the first-year earnings of IS graduates to other business majors. Second, it examines whether total number of major credits affect first-year earnings of IS graduates. Third, It analyzes the impact of total number of core and elective credits on first-year earnings of IS graduates. Finally, it investigates how the number of subject-level core credits affects first-year earnings of IS graduates. By answer these questions, the authors hope to provide IS educators, administrators, and potential students with insights into the impact of major curriculum characteristics on first-year earnings for IS graduates.

2. BACKGROUND

While a considerable amount of research exists examining the knowledge and skills needed for entry-level IS graduates (e.g., Aasheim, Shropshire, Li, & Kadlec, 2012; Capel 2001-2002; Fang, Lee, & Koh, 2005; Gallagher et al., 2010; Lang, 2018; Lee, 2005; Lee & Han, 2008) and the types of jobs available to IS graduates (Peslak et al., 2018; Reich, 1996; Robin & Roggio, 2012), there is a paucity of empirical research on the relationship between major curriculum characteristics and first-year earnings for IS graduates. One such study suggests that internship experience, GPA, job market, and size of employer are significant determinants of first-year earnings for IS graduates (Sandvig, Tyran, & Ross, 2005). More recently, the Association for Information Systems (AIS) in partnership with Temple University released the 2019 Information Systems (IS) Job Index. The 2019 IS Job Index indicates that "salaries for IS graduates are significantly higher than typical business majors for both Bachelor's and most Master's degrees" (p. 3) and that "overall, IS salaries are outpacing business school salaries but growing slowly in contrast to the high demand and placement" (p. 3). According to the 2019 IS Job Index, the average first year-earnings for graduates with a Bachelor's degree in IS was $65,314, while first-year earnings for graduates with a Master's degree in IS was $84,113. Table 1 and Table 2 provide average first-year earnings for graduates with a Bachelor's and a Master's degree in IS since 2013, respectively (note that the IS Job Index is published every other year).

Year	First-year earnings
2013	$57,212
2015	$57,817
2017	$62,820
2019	$65,314

Table 1. Average first-year earnings for graduates with a Bachelor's degree in IS (AIS, 2019)

Year	First-year earnings
2013	$65,394
2015	$67,632
2017	$72,517
2019	$84,113

Table 2. Average first-year earnings for graduates with a Master's Degree in IS (AIS, 2019)

Tables 3 and Table 4 provide a comparison of average first-year earnings by major for Bachelor's and Master's degrees, respectively. Note that IS outpaces other business majors for both Bachelor's and Masters' degrees.

Major (Bachelor)	First-year earnings
Information Systems	$65,314
Accounting	$51,783
Finance	$55,138
Marketing	$45,539

Table 3. Average first-year earnings by undergraduate major (AIS, 2019)

Major (Master)	First-year earnings
Information Systems	$84,113
Accounting	$54,307
Finance	$64,481
Marketing	$56,921

Table 4. Average first-year earnings by graduate major (AIS, 2019)

The National Association of Colleges and Employers (NACE) support the findings reported in the 2019 IS Job Index, stating, IS majors "are projected to have the highest starting salary among Class of 2020 business graduates earning bachelor's degrees" (NACE, 2020, ¶1). Based upon the Winter 2020 Salary Survey, NACE projects the average first-year earnings for IS graduates to be $63,445. NACE also reports that IS is in the top 5 most in-demand business majors for Bachelor degrees and in the top 10 most in-demand business majors for Bachelor degrees.

While the 2019 IS Job Index and the NACE Winter 2020 Salary Survey provide useful information for average first-year earnings for IS graduates compared to other business majors in terms of average first-year earnings, these sources do not

provide empirical information about the extent to which characteristics of the major curriculum impact first-year earnings for IS graduates. Thus, the goal of this paper is to broaden the discussion of how first-year earnings of IS graduates compare to other business majors, while addressing the effect that total number of major credits, total number of core and elective credits, and number of subject-level core credits have on first-year earnings of IS graduates. Thus, this paper addresses the following research questions:

RQ1: How do first-year earnings of IS graduates compare to other business majors?

RQ2: How does the total number of major credits affect first-year earnings of IS graduates?

RQ3: How does the total number of core and elective credits affect first-year earnings of IS graduates?

RQ4: How does the number of subject-level core credits (database management, programming, systems analysis and design, etc.) affect first-year earnings of IS graduates?

3. METHODOLOGY

To conduct this study, we obtained first-year earnings for almost 7,000 IS graduates across 128 universities from the U.S. Department of Education (n. d.). We then obtained the number of major credits, number of core and elective credits, as well as the number of subject-level core credits from the respective university websites. In order to control for potential income differences caused by the region in which a university is located, we obtained state median incomes from the U.S. Department of Commerce (n. d.). Similarly, in order to control for potential income differences caused by the reputation of the university, we obtained university rankings from the U.S. News & World Report (n. d.). We then combined U.S. News & World Report national and regional university rankings into one global ranking by adding the regional rankings to the lowest possible national ranking (i.e. 381). As a result, a university with a regional rank of e.g. 38 would end up with a global rank of 381+38=419. Likewise, we assigned regional unranked universities the lowest possible global ranking (i.e. 552), based on the sum of the lowest national ranking (i.e. 381) and the lowest regional ranking (i.e. 171). Using data from the U.S. Department of Education, we calculated summary statistics of first-year earnings by major (RQ1). Combining all data sources, we conducted multiple regression analyses to predict first-year earnings from the number of IS major credits (RQ2), number of IS core and elective credits (RQ3), and the number of subject-level IS core credits (RQ4) while controlling for state median income and university ranking.

4. RESULTS

For RQ1, results indicate that IS graduates have the highest first-year earnings among business majors ($52,163.28), followed by finance ($48,185.67), and accounting ($44,879.02), graduates. This ranking is in line with both the 2019 IS Job Index and the NACE Winter 2020 Survey. See Table 5 in Appendix A for details about additional business majors, total students and total universities. See Table 6 in Appendix A for additional descriptive statistics of variables used in the regression analyses.

In regard to RQ2, after accounting for state median income and university ranking, the total number of IS major credits does not affect first-year earnings. See Table 7.

Predictor	**β**
State median income	0.427***
University ranking	-0.338***
Total IS major credits	-0.105
*Note: Dependent variable was first-year earnings, N = 128, R^2 = 0.383, *** p < .001*	

Table 7. Results of regression analysis for total IS major credits

For RQ3, after accounting for state median income and university ranking, the total number of IS core and elective credits does not affect first-year earnings. See Table 8.

Predictor	**β**
State median income	0.438***
University ranking	-0.349***
Total IS core credits	-0.049
Total IS elective credits	-0.116
*Note: Dependent variable was first-year earnings, N = 128, R^2 = 0.387, *** p < .001*	

Table 8. Results of regression analysis for total IS core and elective credits

Finally, with regard to RQ4, after accounting for state median income and university ranking, the number of subject-level IS core credits does not affect first-year earnings. See Table 9 in Appendix A.

5. DISCUSSION AND CONCUSION

As noted in the introduction of this paper, there are multiple reasons why an empirically-driven study of first-year earnings of IS graduates is a timely and relevant topic for IS educators. This study revealed that IS graduates have the highest first-year earnings of all business majors, making IS a financially attractive major for business students – especially in light of increasing student debt. This finding also has a bearing on such state-wide initiatives as Texas' 60x30 which has as one of its goals that by 2030, "undergraduate student loan debt will not exceed 60 percent of first-year wages for graduates of Texas public institutions" (60x30TX).

Although it is helpful to know where IS graduates rank in comparison to other business majors, and the results are encouraging, it is also important to have some understanding of the impact of characteristics of the major curriculum have on first-year earnings of IS graduates. While other studies have indicated that internship experience, GPA, job market, and size of employer are significant determinants of starting salary for IS graduates (Sandvig, Tyran, & Ross, 2005), this study revealed that first-year earnings of IS graduates are not affected by the total number of IS major credits, the total number of IS core and elective credits, nor the number of subject-level IS core credits. Thus, the IS major curriculum at a university does not seem to be a relevant for first-year earnings.

These findings leave open the possibility for future research to examine other potential factors affecting first-year earnings of IS graduates beyond state median income, university ranking, and major curriculum characteristics. Moreover, since the present study examined only a snapshot in time, future research may wish to analyze the variation in first-year earnings of IS graduates over time, possibly accounting for changes in the IS curriculum. Lastly, first-year earnings, while certainly important, are only one aspect of financial success. Future studies may wish to analyze earnings of IS graduates five or ten years after graduation.

The conclusion that can be surmised from this study is that, taken together, the findings suggest that applicants wishing to maximize their first-year earnings should study IS at a university with a high ranking located in a state with a high median income. It should be said, however, that although not every IS graduate may find themselves in this scenario, according to the 2019 IS Job Index, the 2020 NACE Winter Salary Survey, and the results of this study, overall, IS graduates are in better shape than other business majors in regard to average first-year earnings and of possessing the financial resources necessary to obtain lifelong success.

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Appendix A

Major	First-year earnings (SD)	Total students	Total universities
Accounting	44,879.02 (8,997.16)	122,386	715
Entrepreneurship	37,907.32 (8,253.04)	1,448	41
Finance	48,185.67 (8,969.79)	45,171	363
Information Systems	52,163.28 (11,079.81)	6,997	128
International Business	43,013.89 (8,382.62)	2,712	72
Management	40,104.64 (8,268.97)	606,254	1,250

Table 5. First-year earnings of selected business majors

Variable	Mean (SD)	Min	Max
First-year earnings	52,163.28 (11,079.81)	17,400	81,600
State median income	60,177.09 (11,243.28)	20,296	85,203
University ranking	294.63 (163.297)	15	552
Total IS major credits	26.477 (8.046)	9	57
Total IS core credits	18.508 (6.777)	0	36
Total IS elective credits	7.969 (5.343)	0	27
IS core credits: Database management	2.828 (1.261)	0	6
IS core credits: Programming	3.336 (2.504)	0	18
IS core credits: Systems analysis and design	2.492 (1.298)	0	6
IS core credits: Networking	1.828 (1.544)	0	6
IS core credits: Project management	1.262 (1.507)	0	4
IS core credits: Security	0.570 (1.170)	0	4
IS core credits: Enterprise architecture	0.434 (1.051)	0	3
IS core credits: Web development	0.492 (1.292)	0	6
IS core credits: Analytics	0.313 (1.078)	0	6
IS core credits: Internship	0.164 (0.685)	0	3
IS core credits: Other	4.789 (3.984)	0	18

Table 6. Descriptive statistics of variables used in regression analyses (N = 128)

Predictor	β
State median income	0.387^{***}
University ranking	-0.342^{***}
IS core credits: Database management	-0.080
IS core credits: Programming	0.051
IS core credits: Systems analysis and design	0.007
IS core credits: Networking	-0.118
IS core credits: Project management	0.015
IS core credits: Security	0.097
IS core credits: Enterprise architecture	0.004
IS core credits: Web development	-0.148
IS core credits: Analytics	0.070
IS core credits: Internship	0.037
IS core credits: Other	0.017
Note: Dependent variable was first-year earnings, N = 128, R^2 *= 0.435,* *** *p < .001*	

Table 9: Results of regression analysis for subject-level IS core credits