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Predicting student success in an undergraduate Sport Management program from performance in general education courses

Joshua D. Pitts*, John D. Johnson

Kennesaw State University, Department of Exercise Science and Sport Management, 520 Parliament Garden Way NW, MD 4104, Kennesaw, GA 30144, United States

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ABSTRACT

This research was a case study of the relationship between student performance in general education courses and required lower division courses and student performance in Sport Management courses at Kennesaw State University (KSU). Regression results indicated that student performance in three general education courses, World Literature, Introduction to Statistics, and American Government, and two lower division courses, Introduction to Sport Management and Introduction to Financial Accounting, are significantly related to student performance in Sport Management courses. The identification of these courses correlated with student success may be useful to other Sport Management programs considering transitioning to a gated admissions process.

1. Introduction

The current study was a case study of the relationship between student performance in general education courses and other required lower division courses and student performance in the undergraduate Sport Management program at Kennesaw State University (KSU) – a large public institution with two campuses located near Atlanta. Academic performance or success, in this study, was measured by the letter grade each student received in a given course. Thus, a better letter grade corresponds to better academic performance and a higher level of academic success.

The necessity of this study came about as the Sport Management faculty at KSU discussed the possibility of transitioning to a gated program design in which students would need to earn a certain grade point average (GPA) in a subset of their general education courses to gain admission to the undergraduate Sport Management program. The current design of the Sport Management program at KSU is shown in Table 1. The current general education requirements at KSU are shown in Table 2. To be clear, the goal of our study was not to identify all of the factors correlated with student success in Sport Management. Thus, we did not consider factors such as race and gender that may or may not be correlated with student success. Similarly, we did not include controls for high school GPA or ACT and SAT scores since these students have already gained admission to the university and these variables would not be considered for admission into the Sport Management program.

In design and scope, the current study is similar to previous studies conducted by Wolkowitz and Kelley (2010) and Herrera and Blair (2015) who attempted to predict student success in nursing programs. The current study is also similar to a previous study by Anderton, Evans, and Chivers (2016) who investigated student performance in a first year undergraduate Anatomy and Physiology course as well as a previous study by Lester (2016) who analyzed the performance of students in an undergraduate Statistical Methods course designed for Psychology majors. While many previous studies have examined the development and design of

* Corresponding author.
E-mail addresses: jpitts20@kennesaw.edu (J.D. Pitts), jjohn235@kennesaw.edu (J.D. Johnson).

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Table 1
Kennesaw State University Undergraduate Sport Management Program.

Lower Division Major Requirements (18 Credit Hours)
SM 2100 – Introduction to Sport Management
SM 2200 – History and Contemporary Aspects of Sport
SM 2300 – Legal Aspects of Sports
SM 2400 – Sports Information and Media
ACCT 2100 – Introduction to Financial Accounting
ECON 2100 – Principles of Microeconomics
Upper Division Major Requirements (36 Credit Hours)
SM 3100 – Sports Sociology and Psychology
SM 3200 – Leadership and Management of Sport Organizations
SM 3300 – Sport Event Management
SM 3400 – Sport Facility Design and Management
SM 3500 – Sponsorship and Fundraising in Sport
SM 4700 – Sports Economics
SM 4800 – Sports Finance
SM 4900 – Senior Seminar in Sport Management
SM 4950 – Senior Internship in Sport Management
Sport Management Electives (18 Credit Hours)
At least 9 h must be from courses at the 3000 level or above

curriculum in Sport Management programs (for example, see Brassie, 1989; Eagleman & McNary, 2010; Jones, Brooks, & Mak, 2008; Petersen & Pierce, 2009; Won & Bravo, 2009), we are only aware of one previous study that has attempted to predict the academic success of students in a Sport Management program. Brown (1990) attempted to identify important factors in explaining academic success in a graduate Sport Management program at an undisclosed university. The sample consisted of 161 students who earned their Masters of Science degree in Sport Management between the years 1977 and 1987. Estimating an ordinary least squares (OLS) regression model, the author found a positive relationship between undergraduate GPA and graduate GPA. Similarly, involvement in extracurricular activities as an undergraduate student was shown to have a positive relationship with graduate GPA. There was also some evidence that students whose undergraduate major was in a business related discipline tended to earn higher GPAs in the Sport Management graduate program, other things equal.

Using data provided by the university's Office of Institutional Effectiveness and employing an empirical methodology similar to Brown (1990), we were able to identify five courses for which students' grades in those courses appear to be significantly correlated with academic success in the Sport Management program even after controlling for student performance in a number of other courses. Three of these courses are part of the general education curriculum at KSU – World Literature, Introduction to Statistics, and American Government. The other two courses are part of the lower division major requirements for Sport Management students at KSU – Introduction to Sport Management and Introduction to Financial Accounting. These findings, which certainly may be different for different programs, are at least a starting point for programs considering transitioning to a gated admissions process.

Table 2
Kennesaw State University General Education Requirements.

Area A1 (6 Credit Hours)	Area D2 7–8 Credit Hours)
ENGL 1101 – Composition I	Students must choose 2 connected Science courses in
ENGL 1102 – Composition II	Environmental Science, Geography, Chemistry,
Area A2 3–4 Credit Hours)	Physics, or Biology
MATH 1101 – Introduction to Mathematical Modeling	Area E1 (3 Credit Hours)
MATH 1111 – College Algebra	POLS 1101 – American Government
MATH 1112 – College Trigonometry	
MATH 1113 – Precalculus	Area E2 (3 Credit Hours)
MATH 1190 – Calculus I	HIST 2111 – United States History to 1877
Area B1 (2 Credit Hours)	HIST 2112 – United States History Since 1877
ECON 1000 – Contemporary Economic Issues	
Area B2 (3 Credit Hours)	Area E3 (3 Credit Hours)
Students must choose 1 of 11 Cultural Perspectives courses	HIST 1100 – Introduction to World History
Area C1 (3 Credit Hours)	HIST 1111 – Pre-Modern World History
Students must choose 1 of 10 World Literature courses	HIST 1112 – Modern World History
Area C2 (3 Credit Hours)	Area E4 (3 Credit Hours)
Students must choose 1 of 4 Fine Arts Courses	Students must choose 1 of 7 Social Science courses
	First-Year Seminar
Area D1 3–4 Credit Hours)	Students must choose 1 of 4 Freshmen Seminar courses
MATH 1107 – Introduction to Statistics	
MATH 1160 – Elementary Applied Calculus	
MATH 1190 – Calculus I	Wellness
MATH 2202 – Calculus II	WELL 1000 – Foundations for Healthy Living

Table 3
Descriptive Statistics.

Sport Management		General Education	
Variable	**GPA**	**Variable**	**GPA**
SM 2100	3.26 (0.69)	WELL 1000	3.28 (0.70)
SM 2200	3.00 (0.64)	ENGL 1101	3.15 (0.69)
SM 2300	3.10 (0.63)	ENGL 1102	3.27 (0.67)
SM 2400	3.58 (0.56)	ENGL 2110	3.07 (0.76)
SM 3100	3.17 (0.65)	MATH 1107	3.00 (0.91)
SM 3200	3.29 (0.64)	SCI 1101	2.61 (0.84)
SM 3300	3.29 (0.67)	SCI 1102	2.78 (0.85)
SM 3400	3.28 (0.65)	POLS 1101	2.84 (0.81)
SM 3500	3.35 (0.64)	HIST 2112	2.97 (0.71)
SM 4700	2.86 (0.76)	ACCT 2100	2.76 (0.81)
SM 4800	2.97 (0.76)		
SM Core	3.17 (0.41)		

Note: Standard deviations are shown in parentheses under means.

2. Data and empirical methods

The data consists of 612 observations on students who earned at least 20 h in Sport Management courses over the period of Fall 2012 – Fall 2016. The data includes the grades each student earned in general education courses and required Sport Management courses completed at KSU. It does not include grades earned in courses completed at other institutions. The primary issue with analyzing the data was that students have many choices in the general education curriculum, as shown in Table 2. Thus, very few students completed the same subset of courses to meet the general education requirements. Combining that with the issue of many students transferring general education credits from other institutions made it impossible to fully research every potential relationship between performance in general education courses and performance in Sport Management courses.

Those are the limitations of the dataset. Fortunately though, there are some courses in the general education curriculum that were much more popular choices among Sport Management majors – World Literature, Introduction to Statistics, Science, Society, and the Environment I, Science, Society, and the Environment II, and United States History Since 1877. Also, Foundations of Healthy Living, Composition I, Composition II, American Government, and Introduction to Financial Accounting are required courses for all Sport Management majors at KSU, and relatively fewer students transferred credit for these courses from another institution. Thus, we were able to explore whether or not better performance in these courses was related to better performance in Sport Management courses. Focusing on these more popular courses among students resulted in 135 observations with which to estimate the regression model.

Table 3 presents descriptive statistics of the data. The descriptive statistics reveal that the most challenging courses for Sport Management students at KSU are Sports Economics (SM 4700) and Sports Finance (SM 4800). Grades in these courses also had the greatest variation among students as shown by the standard deviations reported in Table 3. Perhaps not coincidentally, these are also the only two courses in the Sport Management curriculum at KSU with large quantitative components. The average Sport Management core GPA was 3.17. The Sport Management core GPA reported here consists of only the Sport Management classes shown in Table 1, excluding SM 2100, SM 4900, and SM 4950. SM 2100 was excluded from the Sport Management core GPA calculation because it is used as a predictor variable since it is a prerequisite for all other Sport Management courses at the university. That is, we were interested in exploring whether or not a higher grade in SM 2100 was correlated with a higher Sport Management core GPA. SM 4900 and SM 4950 were excluded due to the nature of these courses, and the way in which they are graded. Also, the Sport Management core GPA calculation does not include any Sport Management electives the student may have taken.

In order to investigate the relationship between performance in general education courses and performance in Sport Management courses, we estimated the following OLS regression model:

$$SM\,Core_i = \beta_0 + \beta_1 SM2100_i + \beta_2 WELL1000_i + \beta_3 ENGL1101_i + \beta_4 ENGL1102_i + \beta_5 ENGL2110_i + \beta_6 MATH1107_i + \beta_7 SCI1101_i + \beta_8 SCI1102_i + \beta_9 POLS1101_i + \beta_{10} HIST2112_i + \beta_{11} ACCT2100_i + \varepsilon \quad (1)$$

where $SM\ Core_i$ is the Sport Management core GPA for student i, the β's are parameters to be estimated, ε is a random error term, and

Table 4
OLS Results.

Variable	Results
Constant	1.418**
	(0.259)
SM 2100	0.160**
	(0.048)
WELL 1000	−0.003
	(0.041)
ENGL 1101	0.029
	(0.046)
ENGL 1102	0.015
	(0.047)
ENGL 2110	0.084*
	(0.040)
MATH 1107	0.066*
	(0.034)
SCI 1101	0.047
	(0.036)
SCI 1102	0.003
	(0.039)
POLS 1101	0.081*
	(0.040)
HIST 2112	0.017
	(0.048)
ACCT 2100	0.105*
	(0.040)
N	135
R^2	0.352
Adjusted R^2	0.294

Note: Standard errors are in parentheses under the coefficients.
* Significant at the 5% significance level.
** Significant at the 1% significance level.

all other variables are as previously defined. The OLS results for Eq. (1) are shown in Table 4. It is important to note that the OLS regression model reveals correlations rather than causal relationships between the dependent variable and independent variables. For example, suppose the coefficient β_1 in Eq. (1) is statistically significant. This implies that there is a statistically significant relationship between a student's letter grade in Introduction to Sport Management (SM 2100) and their Sport Management core GPA even after controlling for the student's grades in the other courses included in Eq. (1) as independent variables. In other words, students who perform better in SM 2100 would tend to perform better in other Sport Management courses. However, for example, this does not imply that a student who earns an A in SM 2100 *will* earn a higher Sport Management core GPA than a student who earns a C in SM 2100. On the other hand, if the coefficient β_1 in Eq. (1) is statistically insignificant, then there is no statistical evidence that a

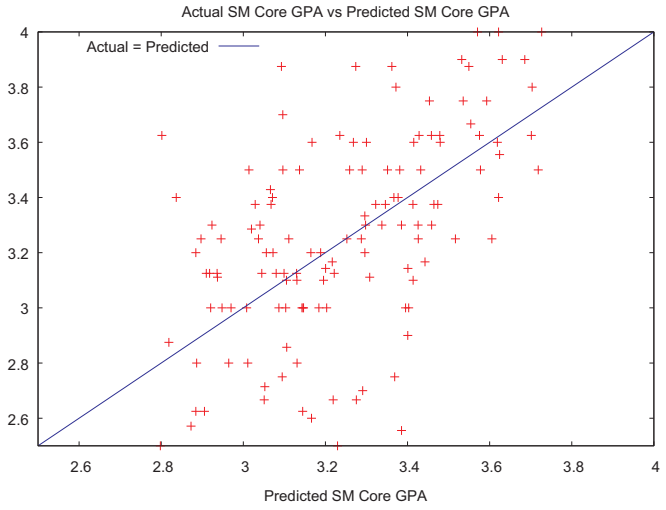

Fig. 1. Points along the regression line represent instances in which the regression equation perfectly predicts a student's actual Sport Management core GPA.

significant relationship exists between a student's letter grade in SM 2100 and their Sport Management core GPA. In this case, a student's grade in SM 2100 is essentially considered to have little explanatory power in predicting a student's Sport Management core GPA. The magnitude of the coefficient should not be ignored either. For example, the greater the magnitude of β_1 in Eq. (1), the greater the relationship between a student's letter grade in SM 2100 and their Sport Management core GPA.

3. OLS results

Fig. 1 displays each student's actual Sport Management core GPA versus their predicted Sport Management core GPA, and it is a graphical representation of Eq. (1). Points along the line represent instances in which the regression equation perfectly predicts a student's actual Sport Management core GPA based on their performance in those courses accounted for in Eq. (1). Points below the line represent instances in which a student's actual Sport Management core GPA is worse than predicted by Eq. (1), while points above the line represent instances in which a student's actual Sport Management core GPA is better than predicted by Eq. (1). The R^2 value for the OLS regression presented in Table 4 is 0.352. Calculating Cohen's f^2 results in an effect size of 0.543, which corresponds to a medium effect. After controlling for performance in other courses, the OLS results for Eq. (1) indicate that there is a statistically significant relationship, at the 5% significance level, between a student's Sport Management core GPA and their grades in the following courses: Introduction to Sport Management, World Literature, Introduction to Statistics, American Government, and Introduction to Financial Accounting.

Perhaps unsurprisingly, based on our estimates, the course that serves as the best predictor of undergraduate success in a Sport Management program is the student's performance in Introduction to Sport Management (SM 2100). Based on our estimates presented in Table 4, each letter grade improvement in a student's SM 2100 grade is associated with a 0.16 point improvement in the student's Sport Management core GPA. For example, a student who earned a grade of A in SM 2100 would be expected to earn a Sport Management core GPA about 0.32 points higher than a student who earned a grade of C in SM 2100, other things equal.

While student performance in English Composition I and English Composition II are not statistically significant predictors of a student's Sport Management core GPA according to our estimates, student performance in World Literature (ENGL 2110) is a significant predictor of Sport Management core GPA. Interpreting the coefficient for ENGL 2110 reported in Table 4 reveals that each letter grade improvement in a student's ENGL 2110 grade is associated with an improvement of 0.08 points in their Sport Management core GPA. A similar relationship was found between a student's performance in American Government (POLS 1101) and their performance in Sport Management courses. The types of assignments and lecture formats in ENGL 2110 and POLS 1101 are likely similar to those of Sport Management courses such as History and Contemporary Aspects of Sport, Legal Aspects of Sports, Sports Sociology and Psychology, and Leadership and Management in Sport Organizations. In fact, in our dataset, student performance in ENGL 2110 was most strongly correlated with performance in Legal Aspects of Sports ($\rho = 0.274$, p-value = 0.00000002) and History and Contemporary Aspects of Sport ($\rho = 0.184$, p-value = 0.020) based on Pearson correlation coefficients. Similarly, student performance in POLS 1101 was most strongly correlated with performance in History and Contemporary Aspects of Sport ($\rho = 0.228$, p-value = 0.006) and Leadership and Management of Sport Organizations ($\rho = 0.168$, p-value = 0.002). If there are few writing assignments in the Sport Management program or if Sport Management professors do not grade for grammar as strictly as English professors but focus more on the content of writing assignments, then it makes some sense that performance in courses such as ENGL 2110 and POLS 1101 would be better predictors of success in a Sport Management program than English Composition courses.

Student performance in Introduction to Statistics (MATH 1107) and Introduction to Financial Accounting (ACCT 2100) are also shown to be significant predictors of Sport Management core GPA. Sports Economics and Sports Finance are the two core Sport Management courses at KSU that require the greatest quantitative ability from students. Calculating Pearson correlation coefficients reveals that student performance in MATH 1107 was strongly correlated with performance in both Sports Economics ($\rho = 0.248$, p-value = 0.00003) and Sports Finance ($\rho = 0.221$, p-value = 0.0002). In fact, performance in MATH 1107 was significantly correlated with performance in all core Sport Management courses at KSU except Sports Information and Media, Sport Event Management, Sport Facility Design and Management, and Sponsorship and Fundraising in Sport. Similarly, performance in ACCT 2100 was significantly correlated with performance in both Sports Economics ($\rho = 0.196$, p-value = 0.0001) and Sports Finance ($\rho = 0.140$, p-value = 0.005). Also, performance in ACCT 2100 was significantly correlated with performance in all core Sport Management courses at KSU except History and Contemporary Aspects of Sport and Sports Sociology and Psychology.

4. Conclusion

This study was not intended to answer all of the questions regarding the prediction of student success in an undergraduate Sport Management program. Furthermore, we recognize that our findings are likely not applicable to every undergraduate Sport Management program. However, for those Sport Management programs considering a gated admissions process in which students must earn a certain GPA in a subset of general education courses, our findings seem to strongly favor considering student performance in World Literature, Introduction to Statistics, American Government (or some similar Political Science course), Introduction to Sport Management, and Introduction to Financial Accounting (or some similar Accounting course).

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