Predicting success in an undergraduate exercise science program using science-based admission courses

Esmat TA, Pitts JD. Predicting success in an undergraduate exercise science program using science-based admission courses. Adv Physiol Educ 44: 138–144, 2020; doi:10.1152/advan.00130.2019.—Student success is an important focus within higher education as it relates to retention, progression, and graduation rates. Limited research exists examining the predictors of success within an undergraduate Exercise Science program. The purpose of this investigation was to examine the viability of an admission policy implemented within an undergraduate Exercise Science program as a method of predicting student success. Data from 652 students from 2012 through 2018 were collected from the University’s Enterprise Information Management system. Regression analysis indicated ES 2100, an introductory Exercise Science course, was the best predictor of student performance in required major courses. Furthermore, the results indicated performance in general education courses, including English Composition II, Precalculus, General Chemistry II Laboratory, Human Anatomy and Physiology II, and General Psychology were also significantly related to performance in the required major courses, after controlling for performance in other courses. The results of the investigation provide insight regarding future success within required major courses in the program. This knowledge can be valuable when examining methods to improve retention of students, progression, minimizing repeat attempts at courses, and improving graduation rates. In conclusion, the identification of these courses, related to student success, may provide valuable insight for other Exercise Science-related programs that are considering implementing a program admission policy.

Introduction

Student success is an important focus within higher education as it relates to retention, progression, and graduation rates. According to the Education Department’s National Center for Education Statistics, almost one-third of first-time college students change their major at least once within 3 yr, with changes more likely among STEM (Science, Technology, Engineering, and Mathematics) majors (6). Research has shown that students may select and change majors for a variety of reasons (5, 8, 9, 15, 19, 21, 22). Those who are unaware and unprepared for the level of scientific content may start a program only to later change their major. Changing to a new major can have a significant financial impact. In the United States, the U.S. Department of Education has regulated that aid cannot be awarded to a student for classes that do not count toward the degree, certificate, or other recognized credential (20), further impacting retention of students who change majors. Proactive identification of courses that serve as program predictors of success may be valuable toward improving student success (17, 23). Designing a curriculum to promote student success should consider identifying these predictors early in the degree progression to promote proactive academic advisement, where degree requirements, prerequisites, and eligibility for admission are discussed (10).

Background information. Kennesaw State University (KSU) is one of the 50 largest public institutions in the United States offering more than 150 undergraduate, graduate, and doctoral degrees to more than 38,000 students on two campuses. Table 1 presents the undergraduate Exercise Science curriculum required at KSU. Table 2 presents the general education courses required at KSU. Within the Exercise Science curriculum, it is common for students who repeat science-based content prerequisites to repeat upper-level major courses, resulting in the need for additional seats to support progression toward graduation. Furthermore, students seeking a repeat attempt may have an earlier ability to register, due to a higher number of completed credit hours, thereby influencing the available seats for students seeking an initial attempt at a required course. Student concerns with course availability and progression toward graduation were present as a result.

Within the program was an existing policy that required students to maintain a 2.75 grade point average (GPA) to enroll in major courses. If the GPA fell below the requirement, the student was no longer able to enroll in major courses until the GPA improved. This policy encouraged students to repeat passing courses in which a C or B was earned to improve GPA and allow program progression, further increasing student demand for courses.

Implementation of an admission policy. A science-based admission policy was implemented to transition to a gated program. Science-based prerequisites with high rates of D, F, and withdraw (DFW) were included. The purpose of the admission policy was to:

1. Improve the retention of students within the program
2. Improve the degree progression
3. Develop an ability to analyze the graduation rates of students admitted to the program separate from those who declared an interest and were not admitted to the program

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Implementation of the science-based admission policy allowed us the ability to delineate between students working toward meeting the admission requirements (Exercise Science Interest) and those admitted to the program (Exercise Science Major). The admission courses included a two-part anatomy and physiology sequence (BIOL 2221, BIOL 2221L, BIOL 2222, and BIOL 2222L), a two-part general chemistry sequence (CHEM 1211, CHEM 1211L, CHEM 1212, and CHEM 1212L), and an introductory Exercise Science course (ES 2100). The program admission requirements included meeting the university admission requirements, an institutional GPA of 2.75, and a 3.00 GPA with a minimum grade of C in the admission courses of BIOL 2221, BIOL 2221L, BIOL 2222, and BIOL 2222L), a two-part general chemistry sequence (CHEM 1211, CHEM 1211L, CHEM 1212, and CHEM 1212L), and an introductory Exercise Science course (ES 2100). The purpose of this investigation was to examine the viability of a science-based admission policy within an undergraduate Exercise Science program as a method of predicting student success within the program.

METHODS

This study was conducted in accordance with the protocols submitted to and approved by the Kennesaw State University Institutional Review Board (no. 19–223). Descriptive statistics and correlations. GPAs and standard deviations for each of the courses examined in the investigation are shown in Table 3. According to Table 3, the average Exercise Science GPA among students included in the data set is 3.43. ES 3700 (Strength and Conditioning) and ES 3900 (Physiology of Exercise) are two of the most difficult Exercise Science courses for students at KSU, as evidenced by each course’s relatively low GPA and high variability compared with other Exercise Science courses. ES 2500 (Principles of Nutrition) is another course that proves to be relatively difficult for some students. In our data set, student performance in BIOL 2222
strongly correlated with student performance in ES 3700 ($p = 0.36, P \text{ value } < 0.01$) and ES 2500 ($p = 0.47, P \text{ value } < 0.01$). Furthermore, for almost all Exercise Science courses, it is true that student performance in those courses is strongly correlated with performance in either BIOL 2222 or ES 2100. Two instances deviate from this trend. Student performance in ES 4650 (Exercise Testing) is most strongly correlated with performance in ENGL 1101 ($p = 0.24, P \text{ value } < 0.01$), while student performance in ES 4900 (Senior Seminar in Exercise Science) is most strongly correlated with performance in MATH 1113 ($p = 0.20, P \text{ value } < 0.01$). This suggests that ES 2100, BIOL 2222, and MATH 1113 (Precalculus) are all strong predictors of success in the undergraduate Exercise Science program at KSU.

Table 4 shows the correlation coefficients between student performances in general education courses, including ES 2100, and student performance in Exercise Science courses. When the courses listed in Table 4 are examined, ES 2100 has the strongest correlation with a student’s Exercise Science GPA. However, performance in all of these courses has a statistically significant relationship with the student’s Exercise Science GPA. Thus, for any of these courses, it is true that, if student $A$ earns a higher grade than student $B$, then we would also expect student $A$ to earn a higher GPA in Exercise Science courses. That would likely be true for the majority of courses offered at any university, even when there is seemingly little relationship with course content. Of the general education courses listed, BIOL 2222, BIOL 2222L, CHEM 1212L, ENGL 1102, and MATH 1113 have a strong correlation with student performance in Exercise Science courses compared with other general education courses. When examining courses currently included in the gated-admission policy for the undergraduate Exercise Science program at KSU, the correlation coefficient between performance in these courses and performance in Exercise Science courses is 0.41, and the relationship is significant at the 1% significance level. This does provide some support for the present structure of the admission process. Overlap exists in the skills and proficiencies measured in various courses. For example, while a student’s performance in college algebra and calculus is likely both correlated with their performance in Exercise Science courses, it is likely unnecessary to include both of these courses in a program’s gated-admission process since these courses evaluate similar skills that would aid student success in an Exercise Science program.

A better way to identify the courses that would predict success in an academic program would be to estimate a regression model with potential predictor courses as explanatory variables and a measure of student performance in the program as the dependent variable. Under this methodology, if both college algebra and calculus should be included as part of the admission process, then the regression coefficients will be significant for both courses. Otherwise, only one or neither of the courses will have statistically significant coefficients.

Regression methodology. The present investigation examined the relationship between student performance in lower-division general education courses and courses required for admission to the program and student performance in the Exercise Science program at KSU. Academic performance, as a measure of academic success, was measured by the letter grade earned in each course. A better letter grade corresponded to better performance and a higher level of academic success. It was not the purpose of the investigation to identify all factors correlated with student success in Exercise Science, but rather to assess the viability of the admission policy. Additional factors that may influence general student success were not addressed in this investigation. The present investigation did not control for high school GPA or scores on standardized tests (ACT and SAT), as the students included in the investigation had been admitted to the university. Data from 652 students from 2012 through 2018 who attempted at least 9 h of Exercise Science credits were collected from the University’s Enterprise Information Management system for analysis.

The data supported analysis beyond correlations to allow the use of regression analysis to examine the relationship between performance in general education courses and performance in Exercise Science courses. Table 2 presents the choices available in the general education curriculum. For many areas within the general education curriculum, Exercise Science students have choices as to which classes to take to satisfy the requirements. This is the case in Areas A2, B2, C1, C2, D1, E2, E3, and E4. The ECON 1000 requirement for Area B1 was not established until the 2016–2017 academic year. Due to these limitations, we are not able to estimate a regression model that includes all general education courses. However, several general education courses have proven to be more popular among Exercise Science students. All students are required to take ENGL 1101 (Composition I) and ENGL 1102 (Composition II) from Area A1 as well as POLS 1101 (American Government) from Area E1. Thus we have earned grades in these courses for all students in our sample. Similarly, we have grades in BIOL 2221, BIOL 2221L, BIOL 2222, BIOL 2222L, CHEM 1211, CHEM 1211L, CHEM 1212, CHEM 1212L, and ES 2100 for all students since these courses are part of the program’s admission policy. In Area A2 of the general education curriculum, MATH 1113 (Precalculus) has proven most popular among Exercise Science students. The same is true for ENGL 2110 (World Literature) in Area C1, HIST 2112 (United States History Since 1877) in Area E2, and PSYC 1101 (Introduction to General Psychology) in Area E4. For all 652 observations, we can include student performance in these courses as explanatory variables in our regression model. Including ECON 1000 as a regressor reduces the number of usable observations from 652 to 174, and the regression coefficient for ECON 1000 is statistically insignificant in the model.

Table 4. Correlation between Exercise Science GPA and general education courses

| Course         | Correlation Coefficient |
|----------------|-------------------------|
| ES 2100        | 0.42*                   |
| ENGL 1101      | 0.27*                   |
| ENGL 1102      | 0.33*                   |
| MATH 1113      | 0.32*                   |
| CHEM 1211      | 0.21*                   |
| CHEM 1211L     | 0.24*                   |
| CHEM 1212      | 0.22*                   |
| CHEM 1212L     | 0.31*                   |
| PSYC 1101      | 0.27*                   |
| BIOL 2221      | 0.29*                   |
| BIOL 2221L     | 0.29*                   |
| BIOL 2222      | 0.34*                   |
| BIOL 2222L     | 0.30*                   |
| ENGL 2110      | 0.26*                   |
| POLS 1101      | 0.20*                   |
| HIST 2112      | 0.23*                   |

ES, Exercise Science. *Significant at the 1% significance level.

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estimated the following ordinary least squares (OLS) regression model:

$$ES\ GPA_i = \beta_0 + \beta_1 ES2100 + \beta_2 ENGL1101 + \beta_3 ENGL1102 + \beta_6 MATH1113 + \beta_7 CHEM1212L + \beta_9 CHEM1211L + \beta_10 BIOL2222L + \beta_11 BIOL2221L + \beta_12 PSYC1101 + \beta_15 ENGL2110, e_i + \epsilon_i$$  

(1)

where $ES\ GPA_i$ is student $i$’s GPA in all Exercise Science courses except ES 2100, $\beta$ is a parameter to be estimated, $e_i$ is a random-error term, and all other variables are as previously defined.

In addition to using ES 2100 as an explanatory variable in our regression model, we also considered using the other lower-division Exercise Science courses (ES 2200, ES 2300, and ES 2500) as explanatory variables. However, both ES 2200 (Safety Training for the Fitness Professional) and ES 2300 (Medical Terminology) have insignificant regression coefficients in our models. ES 2500 (Principles of Nutrition) does have a statistically significant coefficient when included as an explanatory variable and thus is a good candidate for inclusion in the regression model. However, student performance in ES 2100 and ES 2500 is strongly correlated ($\rho = 0.47$, $P$ value < 0.01), and, since students must have only attempted 9 h of Exercise Science courses to be included in the sample, ES 2500 is more valuable to us when being used to calculate a student’s Exercise Science GPA. Nevertheless, our analysis does support using student performance in ES 2500 in the gated-admission policy for an undergraduate Exercise Science program.

RESULTS

The OLS results for Eq. 1 are presented in Table 5. After controlling for student performance in other courses, the regression results show that the best predictor of student performance in the undergraduate Exercise Science program at KSU is ES 2100. According to the results shown in Table 5, a one-letter-grade improvement in ES 2100 is associated with a student’s Exercise Science GPA increasing by 0.16 points. Thus, other things equal, a student earning an A in ES 2100 would be expected to earn a 0.32-point higher GPA than a student earning a C in ES 2100. In agreement with the correlation coefficients presented in Table 3, the regression results also show a strong relationship between a student’s grade in ENGL 1102 and their Exercise Science GPA. Each letter grade improvement in ENGL 1102 is associated with a 0.12-point higher GPA. At KSU, student performance in ENGL 1102 is most strongly correlated with performance in ES 2500 ($p = 0.28$, $P$ value < 0.01) among the Exercise Science courses.

The regression results also indicate that student performance in MATH 1113, CHEM 1212L, BIOL 2222, and PSYC 1101 was significantly related to performance in Exercise Science courses. Similar to ENGL 1102, grades in MATH 1113 are most strongly correlated with performance in ES 2500 ($p = 0.30$, $P$ value < 0.01) among the Exercise Science courses. Grades in PSYC 1101 are most strongly correlated with performance in ES 3700 ($p = 0.31$, $P$ value < 0.01). Grades in CHEM 1212L are most strongly correlated with performance in ES 3600 ($p = 0.33$, $P$ value < 0.01). Lastly, grades in BIOL 2222 are most strongly correlated with performance in ES 2500 ($p = 0.44$, $P$ value < 0.01). As can be shown from Table 3, ES 2500, ES 3600, and ES 3700 are at the lower end of the GPA distribution for student performance. Thus the ability of MATH 1113, CHEM 1212L, BIOL 2222, and PSYC 1101 to explain variations in performance in these difficult Exercise Science courses provides rationale for the statistical significance of their regression coefficients in the model.

In contrast to these courses, the regression results provided no evidence that student performance in Exercise Science courses is significantly related to performance in ENGL 1101, CHEM 1211, CHEM 1211L, CHEM 1212, BIOL 2221, BIOL 2221L, or BIOL 2222L after controlling for performance in the other courses included in the model. However, this may be misleading and, therefore, of value to clarify. For most students, it is true that a student who performs well/poorly in ENGL 1102 also performs well/poorly in ENGL 1101. For example, in our study, we find that the correlation coefficient between performance in ENGL 1101 and ENGL 1102 is 0.44, and that it is statistically significant at the 1% significance level. Similarly, students performing well/poorly in CHEM 1212L will typically perform well/poorly in CHEM 1211, CHEM 1211L, and CHEM 1212. We find strong and statistically significant correlations between performance in CHEM 1212L and performance in CHEM 1211 ($p = 0.71$, $P$ value < 0.01), CHEM 1211L ($p = 0.52$, $P$ value < 0.01), and CHEM 1212 ($p = 0.70$, $P$ value < 0.01) in our data set. A similar analogy can be applied to the insignificant biology courses in relation to their correlation with BIOL 2222 and BIOL 2221 ($p = 0.65$, $P$ value < 0.01), BIOL 2221L ($p = 0.52$, $P$ value < 0.01), and BIOL 2222L ($p = 0.75$, $P$ value < 0.01). To clarify, the coefficient on ENGL 1101 is not insignificant in Table 5 due to no relationship between student performance in ENGL 1101 and Exercise Science courses. This relationship is better captured by the student’s performance in ENGL 1102, and his/her performance in ENGL 1102 is strongly related to performance in ENGL 1101. Thus it would be redundant to require a certain grade in ENGL 1101 and ENGL 1102 as part of a gated program. Rather, it is sufficient to require a certain

Table 5. Ordinary least squares results

| Variable     | Coefficient | T Statistic |
|--------------|-------------|-------------|
| Constant     | 1.42†       | 8.14        |
| ES 2100      | 0.16†       | 4.81        |
| ENGL 1101    | 0.06        | 1.63        |
| ENGL 1102    | 0.12†       | 2.86        |
| MATH 1113    | 0.10†       | 3.98        |
| CHEM 1211    | -0.05       | -1.37       |
| CHEM 1211L   | 0.01        | 0.25        |
| CHEM 1212    | -0.04       | -1.34       |
| CHEM 1212L   | 0.09†*      | 2.98        |
| PSYC 1101    | 0.07*       | 2.34        |
| BIOL 2221    | 0.0003      | 0.09        |
| BIOL 2221L   | 0.02        | 0.61        |
| BIOL 2222    | 0.09*       | 2.25        |
| BIOL 2222L   | -0.02       | -0.33       |
| ENGL 2110    | -0.001      | -0.02       |
| ENGL 2110L   | -0.02       | -0.67       |
| POLS 1101    | 0.03        | 0.93        |
| HIST 2112    |            |             |

| $N$          | 652         |
| $R^2$        | 0.32        |
| Adjusted $R^2$| 0.30        |

$N$, no. of students, ES, Exercise Science. *Significant at the 5% significance level. †Significant at the 1% significance level.
grade in ENGL 1102 only. A similar scenario occurs with the chemistry and biology courses included in the regression model.

Without estimating the regression model, correlation analysis revealed that ES 2100, ENGL 1102, MATH 1113, and CHEM 1212L were good predictors of student success in Exercise Science courses, which is further confirmed with the OLS results. Table 5 displays the added benefit of the regression analysis through two key findings. Table 4 shows that student performance in BIOL 2222L was one of the strongest correlations with student performance in Exercise Science courses. However, the regression analysis reveals that requiring a certain grade in BIOL 2222 is sufficient to capture this relationship. A number of courses listed in Table 4 have stronger or equal correlations with a student’s Exercise Science GPA than PSYC 1101. Yet the coefficient for PSYC 1101 is statistically significant in the OLS results. This suggests that the skills acquired in PSYC 1101, which aid in student success in Exercise Science courses, are not captured by other courses in the model. Thus, even though there are other courses with stronger correlations with student performance in Exercise Science courses, PSYC 1101 is a better choice to use as part of the admissions process.

Comparison to current admission policy. The results of the investigation do support the value of the admission policy for the curriculum designed for the undergraduate Exercise Science program at KSU. However, based on the results of the investigation, the admission policy can be improved. The current policy requires students to earn a 3.00 GPA with a minimum grade of “C” in the courses of BIOL 2221, BIOL 2221L, BIOL 2222, BIOL 2222L, CHEM 1211, CHEM 1211L, CHEM 1212, CHEM 1212L, and ES 2100. Correlation analysis reveals that student performance in all of these courses is significantly related to student performance in Exercise Science courses. However, our regression analysis reveals that it is redundant to include CHEM 1211, CHEM 1211L, CHEM 1212, BIOL 2221, BIOL 2221L, and BIOL 2222L. Rather, CHEM 1212L and BIOL 2222 are sufficient. The regression results affirm the use of ES 2100 as part of the gated-admission policy and suggest the addition of ENGL 1102 and MATH 1113. The correlation coefficient between performance in courses currently in the gated-admissions policy and performance in Exercise Science courses is 0.41, with significance at the 1% significance level. However, if the gated-admission policy were restructured to include a 3.00 GPA with a minimum grade of “C” in BIOL 2222, CHEM 1212L, ENGL 1102, ES 2100, PSYC 1101, and MATH 1113, the correlation coefficient between combined performance in those courses with performance in Exercise Science courses would be 0.54, with significance at the 1% significance level. No single course is so strongly correlated with student performance in Exercise Science courses, whereas performance in ES 2100 alone is more strongly correlated with student performance in Exercise Science courses than combined performance in those courses currently constituting the gated-admissions policy. This highlights the benefit of using a statistical analysis similar to the one presented in this paper to aid academic departments in identifying courses to consider as a part of a gated-admissions process.

DISCUSSION

Concerns related to the need to improve retention of students, program progression, and assess graduation rates led to the development and implementation of a science-based admission policy. To the best of our knowledge, no other investigation has examined the impact of a science-based admission policy on an Exercise Science program. Previous research has suggested GPA as a valuable predictor of program success in similar disciplines. Prior research conducted by Yin and Burger (24) examined the relationship of variables identified at admission to a nursing program to the outcome variable of success on the initial National Council Licensure Examination-Registered Nurse assessment. Investigators found college GPA before admission to the program was the most important predictor of success. In a study conducted examining predictors of successful completion of a baccalaureate nursing program, a higher cumulative GPA was found as a predictor of graduation for students before enrollment in upper-division courses (6). In addition, the investigation found age, science GPA, and grades in an introductory nursing course were also predictors of program completion. In comparison to our investigation, the admission policy developed at Kennesaw State University within an Exercise Science program found alternative indicators of success than GPA alone. Our research included a similar statistical analysis approach compared with other research examining predictors of success in undergraduate programs (3, 11, 14, 17, 23). The results of this investigation suggest the identification of a subset of courses related to student performance in a given discipline is a valid alternative to an admission policy that considers only GPA. Furthermore, because it is often easier for students to retake and earn better grades in individual courses than to retake several courses to raise their GPA to meet a GPA requirement, a gated-admission policy similar to the one detailed in this study can be considered more student centered. The results of our investigation found grades in BIOL 2222, CHEM 1212L, ENGL 1102, MATH 1113, PSYC 1101, and an introductory course ES 2100 to be predictors of program success.

It is of value to identify which academic areas are the best predictors of early success in an exercise science program. The results of this investigation found science-based courses BIOL 2222 and CHEM 1212L as predictors of program success. Courses in anatomy and physiology are often required for students pursuing a health-related career. Furthermore, completion of the first anatomy and physiology course often determines advancement to the next anatomy and physiology course in the sequence (13). Therefore, while only identifying BIOL 2222 for inclusion in our admission policy, there is value to monitoring success in the prerequisite course BIOL 2221. In agreement with previous research examining anatomy and physiology courses as predictors of success among nursing and health-science majors (18), the results of this investigation found BIOL 2222 as significantly related to performance in the required major courses at KSU. The results of this investigation are also in agreement with previous research (7), where the investigators found performance in a biology course significantly related to performance in an Exercise Physiology course. This investigation focused on a course in Exercise Physiology. Exercise science programs often require a course on Exercise Physiology and therefore it is of value to identify
potential predictors of success. Previous research has supported mathematics as a positive influence of performance in university courses including those related to health science (3, 4, 12). Previous research supports the results of this investigation indicating MATH 1113 as a predictor of future program success in exercise science.

An Exercise Science program can benefit from implementation of an evidence-based admission policy designed to predict student success in the program. The Program Director can practically apply the results of the investigation through encouraging academic advisement as it relates to the significance of success in specific courses, including BIOL 2222, CHEM 1212L, ENGL 1102, MATH 1113, and PSYC 1101. From a practical standpoint, it is also of value to monitor success in BIOL 2221, CHEM 1211, CHEM 1211L, and CHEM 1212, as these courses serve as prerequisites or corequisites. Furthermore, the Program Director can communicate with program faculty on the significance of their introductory course (ES 2100) as a predictor of future program success, as the results of this investigation found ES 2100 to be the strongest predictor of success in the program. When a student requests a repeat attempt at the introductory course for the program, it may be of value to discuss with the student the significance of the course and relationship to future program success, as this course may be the strongest predictor of future program success. With this information available, students can make a more informed decision as to whether to continue pursuing an Exercise Science degree after performing poorly in their first attempt at the introductory course.

The Exercise Science curriculum at KSU is a science-based curriculum. Students who perform well in BIOL 2222, a course recommended to be included in the admission policy, are likely to be successful in future program courses, including Exercise Physiology I (ES 3900), Strength and Conditioning (ES 3700), and Clinical Exercise Physiology (ES 4700), based on the results of this investigation. Students who do well in ENG 1101, an additional course recommended for inclusion in the admission policy, are likely to do well in Exercise Science courses in which critical thinking and writing skills are necessary. Successful performance in MATH 1113 may contribute to success in Exercise Science courses in which an understanding of quantitative content is of value, including metabolic calculations, biomechanics, conducting exercise assessments, and analyzing the resulting data to develop an appropriate exercise prescription (1, 2).

Through implementation of an evidence-based admission policy and awareness of predictors of program success, Program Directors, program faculty, and academic advisement can work together to intervene early in the degree progression for the student at risk of not progressing in the program. For the Program Director tasked with assessing, evaluating, and reporting on student success, implementation of an evidence-based admission policy may support improvement in overall program outcomes. Specifically, early intervention may influence the student success through minimizing DFW rates, program progression, and time to degree completion. The implementation of an evidence-based admission policy may support better prediction of enrollment demands, thus improving scheduling. Program Directors may be better equipped to balance faculty workloads with student demand for courses.

There are several limitations to the investigation. This investigation examined the predictors of success within a newly implemented admission policy and did not analyze the impact on student retention in the program, time to degree completion, and graduation rates. Furthermore, the investigation did not analyze the impact of the admission policy on DFW rates for major required courses. Recommendations for future research include examining the impact of an admission policy on student retention in the program, time to degree completion, graduation rates, and DFW rates in major-required courses pre- and postimplementation of the evidence-based admission policy. In addition, the admission courses were not all taught by the same instructor. The variation in instructor likely included a variation in teaching style and corresponding assessments within the course. This may have influenced the final grade in the course earned by the student. Motivational differences between students pursuing a degree in Exercise Science are likely and were not examined. The majority of students pursuing an undergraduate Exercise Science degree at KSU expect to apply to graduate school. Motivational differences may exist between students who intend to apply to competitive graduate programs and those who do not intend to pursue a graduate degree.

This investigation examined predictors of success for an undergraduate Exercise Science program. Predictors of success and the corresponding admission courses recommended are likely to vary for other disciplines. However, it is still of value to examine if the requirements of the program are evidence-based predictors of success for the current curriculum requirements of the program. In addition, the implementation of an admission policy may be restricted by University or Accreditation requirements and may serve as limitations.

Conclusion. The purpose of the investigation was not to provide a comprehensive solution to questions related to student success in an undergraduate Exercise Science program. However, for those Exercise Science programs with a similar curriculum, considering an admission policy as a method of predicting future success in discipline-specific courses, the results of this investigation strongly suggest the value of an evidence-based admission policy.

DISCLOSURES
No conflicts of interest, financial or otherwise, are declared by the authors.

AUTHOR CONTRIBUTIONS
T.A.E. and J.D.P. conceived and designed research; T.A.E. and J.D.P. performed experiments; J.D.P. analyzed data; T.A.E. and J.D.P. interpreted results of experiments; T.A.E. and J.D.P. drafted manuscript; T.A.E. and J.D.P. edited and revised manuscript; T.A.E. and J.D.P. approved final version of manuscript.

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