Success on an Agriculture Teacher State Certification Test Based on Demographics

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Introduction/Need for Research

Most people in Agricultural Education agree that there is a teacher shortage in the profession. Some secondary programs have struggled to find a qualified or certified candidate, resulting in some program closures. Alternative certification has provided some relief to the applicant pool, but even hiring a traditionally certified teacher has not meant the individual was qualified to teach the vast array of disciplines within secondary Agricultural Education. One component of agriculture teacher certification in Texas requires a candidate to pass the Texas Examination of Educator Standards (TExES) in Agriculture, Food, and Natural Resources, 6-12. The exam has six domains: Foundations of Agricultural Education; Agribusiness & Economics; Plant & Soil Science; Animal Science; Agricultural Mechanics & Technology; and Natural Resources & Environmental Science. Candidates do not have to pass each domain but an overall score of 240 is required. This study was conducted to determine whether success on this exam, overall or by domain, can be predicted based on gender, major, transfer student status, transfer GPA, or overall GPA. If such predicators are available, teacher educator programs may be better able to prepare teacher candidates for success on the exam, and subsequently, success as an educator.

Conceptual Framework

Multiple studies have been conducted to predict success on certain certification exams in Texas. Chambers, Munday, Sienty, and Justice (1999) examined predictive effects of several variables on teacher candidate performance on the Professional Development components of the Examination for the Certification of Educators in Texas (ExCET), the forerunner to the TExES. Simonsson, Poelzer, and Zeng (2000) found that success on the ExCET for Hispanic students at universities in South Texas can be predicted reasonably well using several variables. Regarding a specific content area, Guillory (2012) studied educators for their preparedness to teach environmental science based on the content exam success. The interest of this study's researchers was in the TExES Agriculture, Food, and Natural Resources, and no research was found to have been conducted for this exam. Further interest was on different demographics than those examined in previous studies. Researchers also desired to understand how well their institution was preparing teacher candidates for success on the exam and in the profession.

Methodology

Test scores of students at Sam Houston State University taking the TExES AFNR, 6-12, from 2011 through 2016, were secured from reports sent to its College of Education by the State Board for Educator Certification of the Texas Education Agency. Reports included the gender, ethnicity, overall score, and score in the six aforementioned domains. Transfer hours, transfer GPA, overall GPA, and the major of each candidate were secured through the university's Office of Institutional Effectiveness. Multiple Linear Regressions (OLS) were conducted to assess the influence of demographic variables (after controlling for differences in majors) on the overall score and score in each domain. Transfer hours, transfer GPA, overall GPA, gender, and ethnicity (white; non-white) were the explanatory variables used in the regression analysis along with dummy variables for majors to account for the differences in majors.

Results/Findings

Regarding demographics, there were 107 white and 11 non-white student attempts on the exam, which included 34 males and 84 females. The average transfer GPA was 2.81, and the average overall GPA was 3.04. A transfer student was considered as one that had more than 30 transfer hours, and there were 62 such students. The results of the regression analysis showed that overall GPA significantly and positively influenced the overall score ($P<0.001$). A 0.25 points higher overall GPA increased the overall score on an average by 4.76 points. Scores on the Foundations of Agricultural Education ($p<0.001$), Agribusiness & Economics ($p=0.021$), Animal Science ($p=0.004$), and Natural Resources & Environmental Science ($p=0.010$) domains were also significantly influenced by the overall GPA of the student. An increase in student GPA by 0.25 points increased the scores on Foundations of Agricultural Education, Agribusiness & Economics, Animal Science, and Natural Resources & Environmental Science domains by 3.95, 4.49, 4.66, and 4.45 points, respectively. However, scores on the Plant & Soil Science and Agricultural Mechanics & Technology domains were not significantly associated with students' overall GPA. Males significantly outscored females in overall score (12.32 points) and in each domain: Foundations of Agricultural Education (5.32 points); Agribusiness & Economics (9.62 points); Plant & Soil Science (9.63 points); Animal Science (9.56 points); Agricultural Mechanics & Technology (11.73 points); and Natural Resources & Environmental Science (14.04 points). Ethnicity significantly influenced (at 10% alpha level) the scores only in the Agricultural Mechanics & Technology domain as white students scored 9.41 points higher than non-white students. The number of transfer hours and transfer GPA did not significantly influence the overall score and scores in any of the six domains.

Conclusions

This study showed that a student's overall GPA is the best predictor of performance on the certification exam. Male students performed considerably better than female students, especially in the Agricultural Mechanics & Technology and the Natural Resources & Environmental Science domains. Transfer hours and transfer GPA were not major factors influencing the success on the certification exam, meaning that students who transferred in with 30 or more hours, regardless of their transfer GPA, performed just as well as non-transfer students on each domain and overall. Ethnicity is not a factor in predicting success on most (5 out of 6) domains.

Implications/Recommendations/Impact on Profession

Given that there were only 11 attempts on the exam by non-white students, generalizing results based on ethnicity should be made with caution. And while a higher GPA tends to predict a higher likelihood of success on the exam, students with lower GPAs may need review sessions in advance of the exam. Females students can be encouraged to undergo stronger academic preparation in Agricultural Mechanics & Technology, as well as Natural Resources & Environmental Science, so that their chance of success in those domains can be increased. The exam was updated and changed in Fall 2016, including an added domain in Food Science & Processing, so this study should be duplicated in the future for possible changes in success.

References

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