

**Performance of Agriculture Teacher Candidates on Specific Domains  
Within a General Pedagogy State Teacher Certification Exam**

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### **Introduction/Need for Research**

Passing the Texas Examination of Educator Standards (TExES) in Pedagogy and Professional Responsibilities (PPR), EC-12, is required of all Texas teacher certification candidates, regardless of major or field of certification. Agriculture teacher candidates take the same exam as kindergarten and 8<sup>th</sup> grade science candidates. The exam includes four domains: Domain I= Designing Instruction & Assessment; Domain II=Classroom Environment; Domain III= Implementing Instruction & Assessment; and Domain IV=Professional Roles & Responsibilities. An overall passing score is required; a passing score within each domain is not. This study was conducted to determine whether success of students at Sam Houston State University (SHSU) in each domain of the exam could be predicted based on gender, major, overall grade point average (GPA), or agriculture GPA. Agriculture teacher educator programs must prepare teacher candidates for overall success on the exam since passing the exam is required for certification.

### **Conceptual Framework**

This study was based on previous research that focused on success on certain teacher certification exams, and such research found differing outcomes and predictive factors. Chambers, Munday, Sienty, and Justice (1999) examined predictive effects of several variables on teacher candidate performance on the Professional Development component of the Examination for the Certification of Educators in Texas (ExCET), the forerunner to the TExES. Success on the ExCET by Hispanic students at universities in south Texas can be predicted reasonably well using certain variables, according to Simonsson, Poelzer, and Zeng (2000). Buddin and Zamarro (2008) found that licensure test scores of California teachers were unrelated to teacher success in the classroom. Concerning the effect of state-mandated teacher testing, Angrist and Guryan (2007) found no evidence of a corresponding increase in teacher quality. The interest of this study's researchers was in the TExES Pedagogy and Professional Responsibilities (PPR), EC-12, and no research was found to have been conducted for this exam's specific domains. Researchers also desired to understand how well their institution was preparing teacher candidates for success on the various domains of the exam.

### **Methodology**

Test scores of students at Sam Houston State University (SHSU) taking the TExES PPR, 8-12, from Fall 2016 through Spring 2018, were secured from reports sent to the university by the State Board for Educator Certification of the Texas Education Agency. Overall score is reported as a scaled score, while domains are reported as a percentage of correct answers. Gender, major, overall grade point average (GPA), and agriculture GPA of students 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 total score and scores within each domain. Overall GPA, agriculture GPA, and gender were explanatory variables used in the regression analysis along with dummy variables for majors to account for the differences in majors.

## Results/Findings

Simple demographic statistics revealed 49 test attempts by females and 8 by males. The mean overall GPA was 3.33, with males (3.41) outperforming females (3.32). The mean Agriculture GPA was 3.35, as males (3.65) were higher than females (3.30). The average overall exam score was 254.37, with males (254.75) and females (254.31) nearly identical. By major, animal science students (257.886) scored the highest, followed by agricultural business (255.25), interdisciplinary agriculture (253.14), and agricultural engineering technology (246.00). Within domains, the percentage of correct answers for each domain, overall and by gender, were as follows: Domain I, Designing Instruction and Assessment (69.51 overall, 72.38 males, 69.04 females); Domain II, Classroom Environment (73.53 overall, 75.00 males, 73.29 females); Domain III, Implementing Instruction and Assessment (71.56 overall, 69.88 males, 71.84 females); and Domain IV, Professional Roles and Responsibilities (overall 76.02, 75.00 males, and 76.18 females). The highest percentage of correct answers by major within each domain were found for agricultural business majors on Domain I (71.67%) and Domain II (75.83%), while animal science majors performed best in Domain III (75.36%) and Domain IV (76.93%).

## Conclusions

Using Multiple Linear Regressions (OLS), researchers found a significant difference ( $p < 0.03$ ) in Domain III (Implementing Instruction and Assessment) for overall GPA, with a 0.25 point increase in overall GPA leading to a 2.87 point increase in Domain III score. Overall GPA also significantly influenced the scores in Domain IV (Professional Roles and Responsibilities), as a 0.25 point increase in GPA resulted in 2.99 higher points in Domain IV ( $p = 0.002$ ). Interestingly, agriculture GPA showed even more significant differences. Those with higher agriculture GPAs were found to have a higher overall score ( $p = 0.02$ ), and a higher percentage of correct answers on Domain I ( $p = 0.05$ ), Domain III ( $p = 0.002$ ), and Domain IV ( $p = 0.02$ ). A 0.25 point increase in agriculture GPA, on an average, increased overall scores by 4.28 points, the Domain I score by 2.24 points, Domain III by 2.88 points, and Domain IV by 2.34 points. There were no significant differences in overall score or domain score by gender or major.

## Implications/Recommendations/Impact on Profession

In the Fall 2017 semester, the structure and sequence of the courses that include a great majority of the content of this exam was modified, so performance by students who take the exam after September 1, 2018, may have different results, and further research will be needed at that point. The highest percentage of correct answers was found for Domain IV, Professional Roles and Responsibilities, and this is the sole content that has been directly taught by agricultural education faculty (content from other domains has been almost exclusively taught by Secondary Education faculty). After September 1, 2018, Secondary Education faculty will assume sole instructional responsibility. Because the test is theory-based, the significant differences based on overall GPA and agriculture GPA are understandable; thus, students with lower GPAs may need tutorial/prep sessions to better prepare them for the exam. Of additional interest, the state average overall score for the TExES PPR, EC-12, was 265.52 in 2016-17. The average for agriculture majors at SHSU was more than 10 points lower (254.37) for 2016-18. SHSU teacher educators should study and take measures to eliminate that gap.

## References

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