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Student Determinants in the Licensure Examination for Agriculturists of a State College in the Philippines

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ABSTRACT The performance of graduates in board examinations is one of the best gauges of the quality of education offered by an institution. The researchers used the descriptive-correlational method to describe the annual performance of Bulacan Agricultural State College graduates in the licensure examination for agriculturists (LEA) from 2014 to 2017, and to explore the influences of certain factors to their LEA performance. Results showed that socio-demographic factors (age, sex and civil status) had weak correlation to exam performance. Academic factors achieved weak (high school GPA and major courses' GPA), moderate (college admission test score) and high correlation (overall GPA in college and GPA in general education courses). For the academic-related factors, the number of takes had strong correlation; attendance to review class had moderate correlation; and time gap between graduation and board exam, and having agriculture as first course had weak correlation.

INTRODUCTION

Perhaps the best proof of quality of education offered by a higher education institution is the performance of its graduates in the board licensure examination. The licensure examination for agriculturists (LEA) was a significant component of RA 8435 or Agriculture and Fisheries Modernization Act (AFMA) of 1997. Under Title 2 (Human Resources Development), Sec. 75, the act called for the creation of an Agriculture and Fisheries Board under the Professional Regulation Commission (PRC) to upgrade the agriculture and fisheries profession. The first board examination was required to be conducted within one year of the approval of AFMA.

The study on the performance among graduates in board examinations are a common research topic in colleges and universities. These studies were conducted to determine the variables that may have influenced their graduates' performance in the said exams. The results also helped them create intervention strategies toward the improved performance of their institutions in the board examinations.

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Within 2014 to 2017, the passing percentage obtained by BASC graduates for first time takers were sixty percent (April 2017), 51.72 percent (Nov. 2017), 52.38 percent (2016), 18.18 percent (2015), and 52.17 percent (2014), for an average of 46.89 percent. For the overall takers (including retakers), the results were 46.67 percent (April 2017), 52.11 percent (Nov. 2017), 54.17 percent (2016), 13.33 percent (2015), and 51.85 percent (2014) for an average of 43.63 percent. These results enabled BASC to pass the Level 3 Phase 2 accreditation for the BS Agriculture program.

Rosales et al. (2014) studied examinee variables, institutional variables, and program and other variables to the Nursing Licensure Examination (NLE) performance of nursing schools. Among examinee variables, they concluded that being a first timer or repeater, and the number of times the examinee has taken the examination are predictors of the average rating obtained by the examinee in the NLE. Another study on predictors of performance in professional nursing course found that academic factors such as high school general point average (GPA), national achievement test (NAT), and grades in specific subjects have substantial to very high correlation to nursing course performance (Oducado and Penuela 2014).

Perez (2015) also found that there were more passers in the Philippine certified public accoun-

tant (CPA) licensure examination among first-takers than repeaters from their university, and that it took a maximum of five times before a candidate became a licensed CPA. The author was also able to identify the subjects that their graduates found most difficult. Ferrer et al. (2015) reported that gender, high school average grade, college entrance score, attendance to review class and academic performance significantly predict teachers' board exam performance. They also concluded that universities need to intensify admission requirements and retention policies, and that administrators must provide their graduates with review classes. They also advised faculty members to prepare examinations based on the board examination format.

Likewise, Visco (2015) found that the licensure examination for teachers (LET) performance was significantly influenced by Teaching Aptitude test (TAT), and attendance in LET review of the graduates, as well as by the faculty members' educational attainment, trainings/seminars attended, academic rank and workloads. On the other hand, findings of the study of Junio-Pacheco and Allaga (2013) revealed that when the board performance is correlated with the three components of the academic subjects, there is a moderate correlation with the general education, while the correlation between professional education and specialization showed slight correlation. Results also disclosed that there is a very weak relationship to the performance of the students in the said exam (LET) and their academic grades.

Terano (2018) reported that academic performances and pre-board examination performances were good predictors of electronics engineering graduates in the licensure examination. Mohammed and Mohammed (2017) studied the performance of engineering graduates from a university and used the results as basis for a proposed action plan. There was no significant difference among the four-year performance (2008-2011) of civil and mechanical engineering graduates, while there were significant differences in electrical and electronics engineering. Their proposed action plan included review of the curriculum, review of the college retention policy, practice or mock board examination for graduating students, coaching, and conduct of benchmarking in high-performing schools. West et al. (2015) found that there is a positive relationship between study strategies and performance in medical licensing exam. According to them, teaching students to practice and utilize concentration skills when preparing for and taking exams may help improve licensing exam scores.

Aside from these conventional studies, there are also new researches on the use of models to predict performance in licensure examinations. Tarun et al. (2014), for example, used PART and JRip algorithms of WEKA to predict LET performance. Using such models, the study concluded that a reviewee is predicted to fail the LET if the obtained mock board rating is lower than thirty four percent of the total points. Terano (2018) developed a regression model in predicting the ratings in electronics engineering examinations.

Dagdag (2018) utilized correlational method to examine factors that influenced the performance of Bachelor of Agricultural Technology graduates in LEA from Isabela State University – San Mariano Campus. His findings showed that performances in College Admission Test (CAT), academic and course audit were good predictors of the graduates' achievement in LEA.

Objectives

The study aimed to describe the level of performance of Bulacan Agricultural State College in the Philippine licensure examination for agriculturists, and to determine the socio-demographic, academic and academic-related factors that affect the exam performance. The socio-demographic factors included age, sex and civil status. The academic factors studied were high school general point average (GPA), college admission test, college GPA, general education courses GPA, and major courses GPA. The academic-related factors included having agriculture as first or second degree enrolled in, time gap between graduation and first examination, number of times the board exam is taken, and attendance in review classes.

MATERIAL AND METHODS

Research Design and Data Gathering

The study used the descriptive-correlational research design, which describes the degree

to which qualitative and quantitative variables are related and can be used for prediction studies (Fraenkel and Wallen 2009).

The annual level of performance was based on the official results from PRC. A descriptive survey was conducted to determine the demographic profile and some academic-related factors of BASC graduates who took the LEA in 2014-2017. Documentary analysis of graduates' academic data obtained from the Office of the Registrar was also done.

Subjects of the Study

For the first objective, all 167 LEA examinees from BASC (with duplicate entries of repeaters) in 2014-2017 were included to describe the annual level of performance in terms of mean rating and percentage of passers per subject area. For the second to fourth objectives, only 126 examinees with complete data from the registrar's office and from the descriptive survey were included. Repeaters were included only once, during their latest or most current attempt.

Data Analysis

Frequency counts, percentages, mean, standard deviation, and average weighted mean were used to determine the demographic and academic factors and LEA performance. Pearson-r was used to determine the presence of significant relationships between LEA performance and the demographic, academic and academic-related variables. The probability value was used to determine which variables significantly predict LEA performance at 0.05 level of significance. The Statistical Package for Social Sciences (SPSS) version 17 was used. To interpret the result of the correlation, the following guidelines suggested by Cohen (1988) were followed: r =(+/-) 0.10-0.29, weak correlation; r = (+/-) 0.30-0.49, moderate correlation; and r = (+/-) 0.50-1.00, strong correlation.

RESULTS AND DISCUSSION

Annual Level of Performance of BASC Graduates in LEA, 2014-2017

Table 1 shows the annual mean rating of BASC examinees by subject area. The highest scores of first takers were obtained in Soil Science (71.67%) and Crop Protection (71.30%), and lowest in Agricultural Economics (69.45%) and Animal Science (69.68%). For the mean rating of all examinees, the highest scores were obtained on Soil Science (70.09%) and Crop Science (69.67%), and lowest in Agricultural Economics (68.72%) and Agricultural Extension (68.83%).

The annual passing percentage of BASC graduates are presented in Table 2. The highest passing percentages among first takers were obtained in Soil Science (59.38%) and Animal

Table 1: Annual mean rating (percent) of BASC graduates in the Licensure Examination for Agriculturists, by subject area, in 2014-2017

Subject area	*2014*	*2015*	*2016*	*Apr 2017*	*Nov 2017*	*Average*	*Rank*
			First takers				
Crop Science	65.09	71.27	67.23	75.30	72.48	70.27	4
Soil Science	71.78	64.77	70.71	76.00	75.07	71.67	1
Crop Protection	71.30	66.55	70.71	74.70	73.24	71.30	2
Animal Science	70.78	66.59	67.33	72.10	71.60	69.68	5
Agricultural Economics	68.21	68.32	67.81	72.90	70.02	69.45	6
Agricultural Extension	70.83	68.23	68.57	73.30	70.66	70.32	3
			Overall				
Crop Science	65.85	70.67	68.42	73.07	71.82	69.97	2
Soil Science	71.00	62.43	71.63	72.07	73.30	70.09	1
Crop Protection	70.85	64.60	71.21	68.80	72.21	69.53	3
Animal Science	70.04	63.87	67.63	70.27	69.72	69.31	4
Agricultural Economics	68.48	67.60	68.92	69.27	69.35	68.72	6
Agricultural Extension	70.96	65.63	69.46	68.40	69.69	68.83	5

Table 2: Annual passing percentage (percent) of BASC graduates in the Licensure Examination for Agriculturists, by subject area, in 2014-2017

Subject area	*2014*	*2015*	*2016*	*Apr 2017*	*Nov 2017*	*Average*	*Rank*
			First takers				
Crop Science	43.48	45.45	33.33	70.00	60.34	50.52	5
Soil Science	69.57	18.18	61.90	80.00	67.24	59.38	1
Crop Protection	47.83	31.82	61.90	60.00	56.90	51.69	4
Animal Science	65.22	27.27	52.38	80.00	55.17	56.00	2
Agricultural Economics	52.17	31.82	47.62	60.00	41.38	46.60	6
Agricultural Extension	56.52	36.36	57.14	70.00	56.90	55.38	3
			Overall				
Crop Science	44.44	46.67	41.67	60.00	57.75	50.11	4
Soil Science	66.67	16.67	66.67	60.00	61.97	54.40	2
Crop Protection	48.15	33.33	62.50	40.00	53.52	61.41	1
Animal Science	59.26	23.33	54.17	60.00	50.70	49.49	5
Agricultural Economics	51.85	33.33	54.17	40.00	40.85	44.04	6
Agricultural Extension	55.56	33.33	62.50	53.33	54.93	51.93	3

*Passing percentage (percent) – number of examinees that passed the subject area divided by total examinees**Average – average passing percentage of the five examination dates within 2014 to 2017

Science (56%), and lowest in Agricultural Economics (46.60 %) and Crop Science (50.52%). For the overall passing percentage of examinees, the highest scores were obtained in Crop Protection (61.41%) and Soil Science (54.40%), and lowest in Agricultural Economics (44.04%) and Animal Science (49.49%).

These results are different from those obtained by Simon and Quilang (2012), wherein the students from their university performed best in Crop Protection and Animal Science, and least in Soil Science and Agricultural Economics. These are also different from the findings of Dagdag (2018) that their university's highest LEA scores were in Crop Science and Soil Science, while least in Animal Science and Agricultural Extension.

There are many factors that can influence performance in licensure examinations. Dagdag (2018) indicated that the number of subjects in college does not affect much the performance in the licensure exam, especially if examinees focus their review on areas that they had the least number of subjects or units. The current findings imply that improvements in instruction and other aspects of the academe are needed in order to increase the scores toward higher accreditation status. It is worthy to note that Agricultural Economics consistently scored lowest in mean rating and passing percentage not just among first takers, but also among all examinees. The factors that may have influenced this trend in this area may be explored to improve future results.

Relationship of Socio-demographic Factors to LEA Performance

Table 3 presents the relationship of the graduates' socio-demographic factors to their LEA performance. All the three socio-demographic factors studied had weak correlation to LEA performance.

Table 3: Relationship of graduates' socio-demographic factors to their LEA performance

Factor	*R*	*p*	*Interpretation*
Age	-0.080	0.433	Weak correlation
Sex	-0.001	0.990	Weak correlation
Civil status	-0.124	0.164	Weak correlation

Age was shown to have weak relationship (r = -0.080, p = 0.433). Ferrer et al. (2015) also reported no significant relationship between sex and Licensure Examination for Teachers (LET) performance. Sex also had weak relationship (r = -0.001, p = 0.990), which was similar to the

findings of Oducado and Penuela (2014), that sex had no significant relationship to performance in nursing licensure exam. However, Ferrer et al. (2015) reported significant relationship between sex and LET performance. Civil status was likewise shown to have weak relationship to board exam performance (r = -0.124, p = 0.164). These results suggest that students, regardless of their age, sex, and civil status may be able to pass the LEA.

Relationship of Academic Performance to LEA Performance

Table 4 presents the correlation between academic factors and LEA performance. High school average grade had a weak correlation to LEA performance (r = 0.205, p = 0.020). This means that high school grades are not good predictors of LEA performance. The results conform to the findings of Visco (2015) that 4th year high school average grade was not a good predictor of LET performance. They disagree with the results of Ferrer et al. (2015) that high school average grade had a significant relationship to LET performance.

Table 4: Relationship of graduates' academic factors to their LEA performance

Factor	*R*	*p*	*Interpretation*
HS average grade	0.205	0.020	Weak correlation
CAT score	0.500	2.99×10^{-09}	Moderate correlation
College GPA	-0.592	2.42×10^{-13}	Strong correlation
Gen. Ed. GPA	-0.537	7.92×10^{-11}	Strong correlation
Majors GPA	-0.120	0.179	Weak correlation

College admission test (CAT) score was revealed to have a moderate correlation to LEA performance (r = 0.50, p = 0.00), conforming to the results of other researches on board examination predictors (Soriano 2009; Pascua and Navalta 2011; Ferrer et al. 2015; Arce et al. 2016; Dagdag 2018). Thus, higher CAT scores mean higher chances of passing the board exam.

Academic performance in college was measured in this study through the GPA throughout college, as well as GPA in general education courses and major courses. The grades used in this study were the final grades in the students' transcripts of records (1.0, 1.25, etc.), wherein lower numerical values denote outstanding performance, thus the negative signs in the computed Pearson r (lower GPA values or higher academic performance result in higher LEA scores).

The general education (r = -0.537, p = -0.000) and overall college GPA (r = -0.592, p = -0.000) both showed strong correlation, whereas GPA in majors (r = -0.120, p = 0.179) showed weak correlation. This means that grades in major subjects are not as good in predicting performance in LEA compared to grades in general education or minor courses. Except for the results in the GPA for major courses, these results agree with those of other studies, that academic performance have significant relationship to board exam performance (Ferrer et al. 2015; Arce et al. 2016; Chan-Rabanal 2016; Maghuyop 2016; Dagdag 2018; Terano 2018). On the other hand, they disagree with other studies that reported no significant relationship and only slight/weak correlation between grades in college and board exam scores (Junio-Pacheco and Allaga 2013; Visco 2015; Antonio et al. 2016).

Relationship of Academic-related Factors to LEA Performance

Table 5 presents the correlation of academic related factors to LEA performance. Having the agriculture degree as first college course of the respondents showed weak correlation to LEA results (r = -0.042, p = 0.639). The time gap between graduation and examination also had weak correlation (r = -0.086, p = 0.335).

Table 5: Relationship of graduates' academic-related factors to their LEA performance

Factor	*r*	*p*	*Interpretation*
Agriculture as 1st/2nd course	0.042	0.639	Weak correlation
Time gap (grad-LEA)	-0.086	0.335	Weak correlation
Number of takes	-0.695	1.22×10^{-19}	Strong correlation
Attendance to review class	0.476	1.53×0^{-08}	Moderate correlation

The number of takes had strong negative correlation to LEA performance (r = -0.695, p =

0.335), meaning the less number of takes, the higher the chance to pass. Similarly, Rosales et al. (2014) reported that first takers in nursing licensure exam had higher average ratings than repeaters. Attendance to review class had moderate correlation ($r = 0.476$, $p = 0.000$). Ferrer et al. (2015) and Visco (2015) also reported significant relationship between attendance to review class and LET performance

CONCLUSION

Socio-demographic factors investigated in the study (age, sex and civil status) all had weak correlation to LEA performance. For the academic factors, both GPA in college and in general education courses had high correlation, college admission test (CAT) score had moderate correlation, while high school average grade and GPA in major courses had weak correlation to board exam results. For the academic-related factors, the number of takes had strong correlation, attendance to review class had moderate correlation, while time gap between graduation and board exam and having agriculture as first or second course had weak correlation to LEA performance.

Hence, results showed the importance of academic performance, admission test scores, attendance to review classes, and taking the LEA only once (or passing it on the first try) as determinants of performance in the licensure exam.

RECOMMENDATIONS

The state college may institute changes or improvements, based on the results of this study, in its admission and retention policies, curriculum and instruction, and review program for the licensure examination for agriculturists.

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