ACADEMIC, FINANCIAL, AND OTHER FACTORS AFFECTING PERFORMANCE IN THE AGRICULTURAL AND BIOSYSTEMS ENGINEERING BOARD EXAMINATION (2018, 2019, AND 2021) OF BULACAN AGRICULTURAL STATE COLLEGE

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ABSTRACT

State Colleges and Universities (SCUs) in the Philippines, licensure examination performance is a legally mandated, fundamental measure of institutional success and program effectiveness. This critical metric is strictly enforced by regulatory bodies, such as the Commission on Higher Education (CHED), as a key requirement for both program accreditation and official compliance standards. Therefore, investigating the key factors affecting board exam performance is essential for effectively understanding, measuring, and implementing targeted interventions to sustain or improve the institution's status. Analysis of Bulacan Agricultural State College – Agricultural and Biosystems Engineering (BASC - ABE) Program takers (2018, 2019, 2021) showed a first-attempt passing rate of 67.70%. The correlation results provide clear strategic direction for improving this performance: academic performance is key, as taker's GWA showed a moderate correlation with passing, establishing achievement during college as a reliable predictor of board exam success; however, working status presents a barrier, showing a negative moderate correlation that indicates the demands of employment significantly interfere with study time and readiness. Furthermore, enrolment in a review center had only a very low correlation, suggesting that the quality and personalized effort in preparation matter significantly more than the simple act of enrolment. Finally, taking the examination during the pandemic showed a high correlation, highlighting the overwhelming influence of external factors on cohort performance. In terms of challenges, respondents overwhelmingly reported emotional distress, including nervousness, pressure, and mental blockage. To address this, the respondents strongly recommend the institution conduct refresher programs or mock examinations and, critically, prepare graduates not just theoretically but also mentally and emotionally for the licensure examination. Further suggestions include implementing more hands-on, output-based learning in the curriculum and upgrading laboratory equipment to create a more conducive learning environment.

Keywords: *Licensure examination, board exam success factors, Agricultural and Biosystems Engineering program*

INTRODUCTION

The College of Engineering and Technology's Department of Agricultural and Biosystems Engineering (DABE) is fundamentally guided by the BASC mission to provide excellent instruction and produce highly competent graduates. This commitment follows a history of success, highlighted by consecutive 100% passing rates in 2004 and 2005 and a Top 1 rank in 2006, which secured the ABE program's status among top national performers. Although the program maintained performance above the national average through 2018 (72.73%) and 2019 (52.38%), a troubling decline culminated in the 2021 board examination result of 36.36%, falling 0.06% below the national passing rate. This unprecedented low performance threatens the department's accreditation standards and necessitates immediate action, particularly since licensure performance is a key indicator of educational quality (Hermosisima, 2003) and graduate readiness. The DABE is thus compelled to re-evaluate the factors influencing this trend and align instructional strategies with board competencies (Amanonce & Maramag, 2020). Therefore, this study aims to identify the academic, economic, and social factors affecting examinee performance across the 2018, 2019, and 2021 licensure examinations, providing an essential evidence-based platform for devising strategic interventions and a work plan to enhance the program's performance.

METHODOLOGY

Research Design or Type of Study

A descriptive study was conducted employing thematic analysis of qualitative data. The study focused on the examinees of the Bachelor of Science in Agricultural and Biosystems Engineering (BSABEN) program at the BASC CET.

Sources and Materials

Data were gathered from the Professional Regulatory Commission (PRC) results, the CET DABE's list of BSABEN graduates and Student Scholastic Records, the BASC Admission Test (BASCAT) results, and structured questionnaires

Data Collection Techniques, and Sampling Procedure

The study utilized purposive sampling, including BASC-ABE licensure examination takers and retakers from the 2018, 2019, and 2021 batches. The total sample size was 31 examinees. Data were collected via a Google Form survey and verified through subsequent one-on-one interviews (via phone call or scheduled appointment).

Statistical Analysis

Descriptive and qualitative data were analyze using deductive thematic analysis and Pearson correlation. Data were organized and processed using excel sheets and Statistical Package for the Social Sciences (SPSS).

RESULTS AND DISCUSSION

Socio Demographic Profile

A total of 31 examination takers responded to the survey questionnaire, representing the examinees of the ABE Licensure Examination from the 2018, 2019, and 2021 batches. As shown in Table 1, the sample comprised of 58.10% males and 41.90% females.

Table 1- Sex Profile of Respondents

Sex	Number of Respondents	Percentage (%)

Male	18	58.10
Female	13	41.90
TOTAL	**31**	**100.00**

Regarding marital status, in Table 2, majority were single (29). Among them, 20 passed the licensure examination while 9 failed. Of the 2 married takers, one failed on the first attempt, and the other did not take the examination immediately after graduation.

Table 2- Civil Status of Respondents

Civil Status	Number of Respondents	Percentage (%)
Single	29	93.50
Married	2	6.50
TOTAL	**31**	**100.00**

The majority of the respondents, as shown in Table 3, belong to a total number of households of 4 to 6 members (67.70%), followed by 1 to 3 members (16.1%), while the remaining belong to 7 to 11 members (6.50% and 9.70%).

Table 3- Household Size of Respondents

Size of Household	Number of Respondents	Percentage (%)
One to three members	5	16.10
Four to six members	21	67.70
Seven to nine members	2	6.50
Ten to twelve members	3	9.70
TOTAL	**31**	**100.00**

Meanwhile, Table 4 shows that the largest group of takers (38.70% each) was categorized under low-income earners and low-middle to middle-middle class income earners, respectively. This result shows that the majority of the examination takers fell under the low to middle-middle income categories, as based on FOI (2023) classification.

Table 4- Gross Family Income of the Respondents

Gross Family Income (Php/mo)	Number of Respondents	Percentage (%)
Php10,000 – 30,000	12	38.70
Php30,001 – 60,000	12	38.70%
Php60,001 – 90,000	6	19.40%
Php90,001 and above	1	3.20%
TOTAL	**31**	**100.00%**

Academic, Economic, Mental and Others Factors

Among the respondents, as shown in table 5, 67.70% had passed the licensure examination while 32.30% had failed on the first of the examination.

Table 5 – Licensure Examination Result

Licensure Exam Result	Number of Respondents	Percentage (%)
Passed	21	67.70
Failed	10	32.30
TOTAL	**31**	**100.00**

Based on their general weighted average (GWA), on Table 6, 41.90%, 38.70%, 12.90% and 3.20% of the respondents had GWA from 1.91 to 2.20, 2.21 to 2.50, 1.70 to 1.90 and above 2.51, respectively.

Table 6 – ABE Graduates General Weighted Average (GWA)

General Weighted Average	Number of Respondents	Percentage (%)
1.70-1.90	4	12.90
1.91-2.20	13	41.90
2.21-2.50	12	38.70
2.51 and below	1	3.20
TOTAL	**31**	**100.00**

Table 7 presents the Pearson correlation between the takers' GWA and passing the licensure examination, showing a perfect positive correlation that is significant (5% level). This indicates that having good grades positively affects the likelihood of passing the exam with the Pearson correlation coefficient (r=0.443) shown in Table 8 confirms a moderate correlation and aligns with related studies, such as Dagdag (2018), and Nicolas et al. (2020), who found a moderate to strong correlation between academic factors and passing the examination.

Table 7 – Correlations of Passing the Licensure Examination and GWA

	GWA	Licensure Examination Performance
GWA Pearson Correlation	1	.443*
Sig. (2-tailed)		.014
Licensure Examination Performance Pearson Correlation	.443*	1
Sig. (2-tailed)	.014	
N	31	31

Correlation is significant at the 0.05 level (2-talied)

Only 33.30% of the successful examinees had enrolled in a review class or center. Furthermore, the study showed that 64.50% of all examinees took the licensure examination immediately after graduation, with the remaining 35.50% taking a delay of a year or two. Notably, among the ten respondents who failed their first attempt, six had attended a review center, yet none of them enrolled in a review for their second attempt. Statistical analysis revealed a Pearson correlation coefficient (r = 0.033) which categorized as a very low correlation, suggesting that enrolment in a review center, by itself, is not a strong factor in increasing the chances of passing the examination.

Table 8 – Pearson Scale of Correlation Coefficient

Scale	Value
0 < r ≤ 0.19	Very Low Correlation
0.2 ≤ r ≤ 0.39	Low Correlation
0.4 ≤ r ≤ 0.59	Moderate Correlation
0.6 ≤ r ≤ 0.79	High Correlation
0.8 ≤ r ≤ 1.0	Very High Correlation

Table 9 – Correlations of Passing the Licensure Examination and Enrolling to Review Center

	Licensure Examination performance	Enrolling to review center
Licensure Examination performance Pearson Correlation	1	.033
Sig. (2-tailed)		.859
Enrolling to review center Pearson Correlation	.033	1
Sig. (2-tailed)	.859	
N	31	31

Regarding the financial factor, 29.03% of the examinees were working during their review period. Of these, seven respondents held full-time jobs related to their profession, while two were employed in non-related positions. Conversely, the results of the study indicated that the majority of respondents who did not work and instead focused solely on the review and licensure examination had successfully passed the exam.

Table 10 – Takers Employment Status During Respondent's Review and Licensure Examination

Employment Status	Number of Respondents	Percentage (%)
Working	9	29.03
Not Working	22	70.97
TOTAL	**31**	**100.00**

The Pearson correlation coefficient r of -0.539 indicates a negative moderate correlation, as shown in Table 11. This result proves an inverse relationship, meaning that the working factor moderately affected the passing percentage: those who were working had a moderate chance of either passing or failing the examination. Conversely, this suggests that those who were not working had higher chances of passing the licensure examination. This finding is similar to the study conducted by Dagdag (2018) on performance indicators for the agriculturist licensure examination.

Table 11 – Correlations of Licensure Examination Performance and Working Status during the Review

	Licensure Examination Performance	Working Status during Review
Licensure Examination Performance Pearson Correlation	1	-0.539**
Sig. (2-tailed)		.002
Working during the review Pearson Correlation	-0.539**	1
Sig. (2-tailed)	.002	
N	31	31

****Correlation is significant at the 0.01 level (2-talied)**

Results in Table 12, also revealed that 71.00% were supported financially by their family, while 22.60% supported themselves and 6.50% were supported by other people having majority of the examination takers though coming from low to middle-middle income earners has been supported by their family.

Table 12 – Financial Support System for the Licensure Examination

Financial Support	Number of Respondents	Percentage (%)
Self-Supporting	7	22.60
Family	22	71.00
Others	2	6.50
TOTAL	**31**	**100.00**

Other factors that may had affected their performance in the licensure examination considered was the pandemic condition in Table 13. Among the 31 respondents, four had experienced health problems related to COVID and were home-quarantined. When validated if they had been able to review during the period, they answered positively but had difficulty focusing on the review.

Table 13 – Exposure to COVID 19 during Review

COVID 19 Exposure	Number of Respondents	Percentage (%)
2021	13	41.94
2019	11	35.48

2018	7	22.58
TOTAL	**31**	**100.00**

Pearson correlation coefficient r of 1 had a perfect negative correlation as shown in Table 14 having high correlation. This means that those who had taken the examination during the pandemic period had lesser chances of passing than those who had taken the board examination during the pre-pandemic period.

Table 14 – Correlations of Licensure Examination Performance and Examination during the Pandemic

	Licensure Examination Performance	Examination during pandemic
Licensure Examination Performance Pearson Correlation	1	-0.727**
Sig. (2-tailed)		.000
Examination during pandemic Pearson Correlation	-0.727**	1
Sig. (2-tailed)	.000	
N	31	31

****Correlation is significant at the 0.01 level (2-talied)**

Problems or Challenges, Suggestions and Recommendations

Table 15 summarizes the respondents' problems and challenges during their review and examination. Emotionally, the most frequent issue was feeling nervous and pressured (19), though 15 reported feeling relaxed; others suffered from stress and anxiety (9). Mentally, 11 respondents reported difficulties like mental blockage and memory retention issues, while 10 felt prepared; a smaller group (6 total) felt unprepared or worried about cancellation. Concerning health, social, and financial aspects, the majority of respondents (24-26 per category) reported no significant problems. However, a minority reported health issues such as over-fatigue (5), social issues like family problems/pressure (3), and financial issues where four had limited support and another four struggled with sustenance (e.g., food, reviewers).

Table 15 – Problems or Challenges Encountered During Review

	Problems and Challenges Encountered			
Emotional	Nervous and pressured	Tired and Distracted	Stress and with anxiety	Relax, Confident and Excited
	19	2	9	15
Mental	Unprepared and unready	Mental blockage, confusions, cannot remember lessons, and memory retention problems	Good, Ready and Prepared	Anxiety and worried due to cancellation of exam
	4	11	10	2

Health	Over fatigue, tiredness, exhausted, lack of sleep	Healthy and no problems encountered	Headache, fever, chickenfox
	5	24	2
Social	Review environment not conducive	No problems encountered and with supportive family	With family problems, pressure from family and no one to talk to
	2	26	3
Financial	Financially not stable, limited support	No problems encountered, financially supported	Food, accommodation, transportation, reviewers, internet and textbooks
	4	25	4

As shown in Table 16, the majority of respondents suggested improving ABE graduate performance by conducting local and in-house review programs (9) and helping graduates prepare mentally and emotionally (7), with further recommendations including exposing students to licensure examination-type tests, conducting refresher programs/mock examinations, emphasizing basic education before major subjects, adding more practical field activities, allowing more review time, and incorporating the Philippine Agricultural Engineering Standards (PAES) into their curricula.

Table 16 – Suggestions and Recommendations of the Respondents to Improve the Licensure Examination Performance of BASC ABE Graduates.

Suggestions and recommendations	No. Respondents	Rank
Conduct Local in-house review and provide good review material	9	1
Prepare graduates mentally and emotionally for licensure exam	7	2
Expose students to licensure examination type of tests	2	3
Conduct refresher programs / mock examination	2	4
Focus on basic education before major subjects	2	5
Add more practical field activities	2	6
Add more time for review	1	7
Focus on PAES	1	8

Table 17 presents the respondents' suggestions for improving the curriculum and instructional methods. The top recommendations were to implement hands-on and output-based learning (5 respondents) and to incorporate more board exam-relevant academic topics (4 respondents). Other key suggestions included the continuous

improvement of teaching processes for greater clarity, the integration of PAES (Philippine Agricultural Engineering Standards) into subject matter, the use of licensure examination-type questions in student assessments, and the increased use of illustrations to aid comprehension. Additional recommendations focused on institutional strategies, such as the need to identify student weaknesses, the potential for adding dedicated board review subjects, and discussing subject history to enhance student appreciation.

Table 17 – Suggestions of the Respondents to Improve the Licensure Examination Performance of BASC ABE Graduates in Terms of Instructions and Curriculum

Suggestions and recommendations	No. Respondents	Rank
Implement hands-on and output-based learning	5	1
Add more academic topics regarding board exam	4	2
Continuous improvement of the process of teaching, making it clearer and understandable for students	2	3
Incorporate PAES	2	4
Incorporate problem solving licensure exam-type questions in students examination	2	5
Use more illustrations in concept presentation	2	6
Identify weaknesses of students	1	7
Add subject solely for board review	1	8
Discuss history if subject for more appreciation	1	9

In terms of laboratory equipment and facility there were only two suggestions, the provision of more equipment to promote hand-on and output-based learning among students during their study (14) and to add more advance or system for laboratory equipment and facility with air condition (8), as shown in table 18.

Table 18 – Suggestions of the Respondents to Improve the Licensure Examination Performance of BASC ABE Graduates in Terms of Laboratory Equipment and Facility

Suggestions and recommendations	No. Respondents	Rank
Provision of more equipment to promote hands-on/output-based learning	14	1
More advance technology or system with airconditioning	8	2

The examination takers suggested, as shown in table 19, to add more ABE related books in the library (13 respondents). Followed by availability of reviewers, having conducive library environment like accessibility, free internet, friendly environment, and with air-condition; addition and provision of e-books, e-learning materials, and e-library; to have extended duration of borrowing books and to have subscription to journal and published articles.

Table 19 – Suggestions of the Respondents to Increase the Licensure Examination Performance of BASC ABE Graduates in Terms of Library Facility

Suggestions and recommendations	No. Respondents	Rank
More ABE related books	13	1
Availability of Reviewers	2	2
More conducive library environment like accessibility, free internet, friendly environment, and with air-conditioning	2	3
E-books, e-learning materials, and e-library	2	4
Extended duration of borrowing books	1	5
Subscription to journal and published articles	1	6

CONCLUSION AND RECOMMENDATIONS

Conclusion

In conclusion, the study established the typical respondent profile as slightly male-dominated (58.10%), from families of four to six members (67.70%), with most family incomes categorized as poor or middle-middle-earner (38.70%). Of the 31 examinees, 67.70% passed succeeding on their first attempt, though only 33.30% of passers had enrolled in a review center. Most takers (64.50%) sat for the exam immediately after graduation. Key insights from the correlation analysis revealed a moderate positive correlation between passing and GWA, a very low correlation with review center enrollment, a negative moderate correlation with working during the review, and a high correlation with taking the exam during the pandemic. The primary challenges reported were emotional stress (nervousness/pressure) and mental difficulties (blockage, confusion, memory retention), though most reported no significant problems concerning their health, social life, or finances. Respondents' top suggestions for performance improvement included conducting refresher programs/mock examinations and preparing graduates mentally and emotionally. For instruction and curriculum, they prioritized hands-on/output-based learning and adding board exam-relevant topics, supported by the recommendation for more equipment and advanced facilities.

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