



Evaluating the Academic Enhancement Program on Business Students' Outcome

Vicente E. Montano¹, Clyde Abner Valdez²

^{1,2} College of Business Administration Education, University of Mindanao,
Bolton St., Davao City, Philippines

ABSTRACT: This research examines the academic enhancement programs in the seven business programs conducted under the STREAM. Results indicate a statistically significant positive relationship between post-test performance and success in professional courses through the representation of $\chi^2 = 4.1670$ ($p = 0.0421$). Overall, programs successfully resulted in volunteer students passing their professional courses by 84.73%, whereas post-test success reached 75.86%. Although the connection between post-test and professional outcomes was modestly strong (Phi Coefficient = 0.1051), it is established that reasonable passing rates in both tests indicate that these targeted interventions have done the job by building on essential business competencies, such as critical thinking, academic integrity, and data analysis skills. Recommendations include replication of best practices for the most successful program implementations, student monitoring, personalized support, and continuous expansion of the scope of enhancement offerings in response to emergent business education needs. The findings underscore the significance of these programs, which provide a lifelong trajectory of academic and professional development for business students.

KEYWORDS: Business students, Chi-square, Enhancement program, Phi-coefficient, UNSDG no. 4

INTRODUCTION

Business students could evolve prepared and ready to face the demands and expectations of a competitive and dynamic business world today. The enhancement programs enrich the curriculum with hands-on training, skill development workshops, and exposure through much-needed experience-oriented learning that leads students to come out entirely well-rounded and industry-ready by the end of graduation (Yoon et al., 2020). Through enhancement activities such as leadership development sessions, seminars in contemporary business practices, and public speaking and communication workshops, the students receive those soft skills and competencies that transcend theories (Selamat et al., 2013). It makes the students even more capable problem solvers with an excellent aptitude for strategic decision-making and effective collaboration in executing business operations (Sparrow, 2017).

The enhancement programs instill entrepreneurial thinking into students' minds, encouraging them to be creative and proactive in solving business problems. Through case studies, business simulations, and internship participation, students connect classroom learning with the professional application of industry standards and expectations (Bourmistrov & Åmo, 2022). Students are thus empowered to build and expand valuable networks with other professionals, mentors, or peers, which are critical in developing their careers (Penaluna & Penaluna, 2009). Experiences with industry leaders and co-curricular activities expose students to various career pathways and opportunities for translating class ideas into practical settings to improve general employability (Ito & Kawazoe, 2015).

Such programs, then, concentrate on personal and professional development, which, among others, comprises inculcating a sense of responsibility for acting ethically, recognition of global society, and social impact, which are more relevant in present-day business practices (Earley & Porritt, 2014). Students learn to be proper professionals and responsible citizens who give meaning to society through holistic enhancement programs. The enhancement program provides a business student a competitive edge, fitting them to thrive and lead their careers (Rutz et al., 2012).

Attending the STREAM enhancement programs in the College of Business Administration Education gives students the essence of development, especially in the skill of critical thinking. An ability to help students think analytically and solve problems interdisciplinarily makes STREAM satisfy that trend in the combined dimensions of STREAM (Howlett et al., 2016). Various activities to challenge conventional thinking and evidence-based reasoning teach students to approach complex issues methodically.



With all this emphasis on thinking critically, the business student applies skills in testing information, building well-supported conclusions, and using acquired knowledge in all sorts of varied and academic/practical applications, which are abilities essential in class and at work (Klaassen, 2018).

The STREAM program also inculcates and teaches each member to achieve integrity with academics and ethical principles, equated with honest scholarship work. Students learn originality, avoiding plagiarism, and citation (Macfarlane et al., 2014). Emphasis on integrity secures academic outcomes more favorably while equipping them to reflect the professional world in which integrity is integral. The honesty and diligence in doing their job set students up with a foundation for responsible decision-making that is helpful over the long run (Almutairi, 2022). The STREAM program, in detail, keeps the student informed of how any individual makes a purchasing decision, what psychological factors influence consumer behavior, and related knowledge on other topics that enable students pursuing careers in business, marketing, or economics to become much better marketers and foretellers of market trends (Löfström et al., 2015). The enhancement programs are learned through hands-on projects and case studies to analyze consumer data into predictive behavioral patterns. Thus, the knowledge is directly applied to the real world. Subsequently, the students become innovative problem solvers and strategic thinkers who understand market dynamics.

The students also receive various advanced analytical tools in the STREAM program, such as Winter's forecasting method through Excel, an application used in time-series analyses. Mastery of this method gives a student an arm's length advantage in working with data, finance, supply chain management, or operations (Jordan & Bak, 2016). The ability to apply Winter's method on a worksheet in Excel is an efficient skill that makes one better prepared when using technology to make strategic decisions while forecasting seasonal data with trends. This hands-on experience in data-driven forecasting increases their technical competency and enhances their ability to make well-informed, evidence-based business decisions (Birou et al., 2022).

This study contributes to the United Nations Sustainable Development Goal 4: Quality Education, providing evidence-based insights into whether academic enhancement programs are effective for business students. This research supports the development of targeted educational strategies for better learning outcomes and academic performance through rigorous analysis of the relationship between post-tests conducted after the enhancement training and student success in professional courses. This supports SDG 4, which focuses on guaranteeing quality education and promoting decent and lifelong learning opportunities for everyone. It identifies best practices that can be scaled or adapted to bridge gaps in education and encourage a more supportive and high-quality learning environment toward equipping students with skills and knowledge bases that are directly pertinent for sustainable economic and personal development.

This study aimed to measure the effectiveness of the STREAM Enhancement program provided to 203 volunteer business students during the second semester of the academic year 2023-2024 by exploring the post-test scores obtained after enhancing training and their success in passing professional courses. More specifically, this paper will (1) establish if any meaningful relation exists between the post-test performance and outcome of the course using the Chi-square measure of independence, (2) measure the strength of established relations using measures such as Cramer's V and Phi coefficient, and (3) establish the practical impact of post-test performance in the chances of passing through the computation of odds ratios and risk ratios. The general goal here is to provide a comprehensive analysis that can subsequently inform the continuous improvement of academic support initiatives.

RELATED LITERATURE

Several theories and studies examining the enhancement programs amongst business students are viewed under many facets, stressed through the notion that comprehensive education leads to complete, competent, and flexible employees. Various educational theories form the cradle of such programs. For example, Kolb's Experiential Learning Theory focuses on such experiences when the students learn more as they try to engage with real-life scenarios practically (Akella, 2010). The enhancement programs designed according to this theory help produce practical experiences through internships, business simulations, and case competitions, enabling students to apply theoretical concepts meaningfully to enhance learning retention and critical thinking (Murrell & Claxton, 1987).

Another theoretical framework supporting enhancement programs is Bloom's Taxonomy of Educational Objectives. This taxonomy articulates a progression of cognitive skills from simple recall to complex analysis and evaluation (Horner et al., 2005). Enhancement programs for business instruct students beyond basic understanding to analyze and synthesize information and apply it to diverse and



complex situations related to business concerns. It aligns with the requirement for developing higher-order thinking skills, the critical step in the development process that impacts choices and strategic planning in business environments (Larkin & Burton, 2008), (Ormell, 1974).

According to Vygotsky's Social Development Theory, the essential social context of learning enhancement programs involves group projects and industry interactions with peer collaboration that facilitates a lively atmosphere for the student's learning while learning with mentors, professionals, or peers (Shabani, 2016). Such a social environment generates communication, teamwork, and leadership skills that are hallmarks of corporate life. This theory also supports one aspect of scaffolding - that students learn expertise through carefully structured and increasingly challenging experiences to which programs for enhancement are well-suited (Eun, 2011), (Erbil, 2020).

Popular relevant literature also sheds light on the educational impact of enhancement programs on the business. Evidence shows that business students undertaking enhancement programs manifest higher levels of Emotional Intelligence (EI), which is now considered more important for business leadership and management (Chapin, 2015), (Fletcher et al., 2009).

Competencies include a series of programs that involve more teamwork, leadership, and other real-world experiences. Studies have shown a strong correlation between effective leadership and conflict resolution; this explains why emotional intelligence is believed to be very close and related to someone being highly effective (Valente & Lourenço, 2020, February). In addition, literature on 21st-century skills explains that business professionals in this millennium require more than mere technical skills; they need soft skills that comprise communication, problem-solving abilities, adaptability, and awareness of cultures. Enhancement programs are devised to develop these skills by exposing them to diverse scenarios and challenges (Pandey et al., 2015). As Tony Wagner relates in *Seven Survival Skills for the 21st Century*, such education encourages critical thinking, collaboration, adaptability, and more, all tied into the enhancement programs (Wagner, 2014).

The human capital theory upholds the view that production increases with investments into education and training, improving economic value. Through these enhancement activities, graduating business students become more attractive and better equipped for the demands of the workforce, thereby, better employment outcomes and higher starting salaries (Marginson, 2019). Employers also value candidates with practical experience, critical thinking skills, and the ability to adapt to rapidly changing environments—all cultivated through such programs (Aboobaker, 2020). Enhancement programs are relevant to business education because they are grounded on theory and comprise extensive literature. They help students acquire knowledge-based professional knowledge and equip them with the skills and adaptability required to perform well in fast-moving and quickly-changing environments in modern business operations (Becker, 2009).

METHOD

A total of 203 business students from the seven (7) programs, BSBA major in Business Economics, Financial Management, HR Management, Marketing Management, BS in Entrepreneurship, Real Estate Management, and Legal Management volunteered for the enhancement program of the second-semester academic year 2023-2024, and to determine the effectiveness of the program, a measure of association was conducted through comprehensive statistical analysis. This study aims to find the relationship between post-test diagnostic scores and having a high chance of passing professional business courses. To be more precise, this explains the strength and nature of these relationships by making use of the Chi-square measure of independence, Cramer's V, Phi coefficient, the odds ratio, and the risk ratio (Weisburd et al., 2020).

The chi-square measure of independence was used to test if there was a statistically significant association between the categorical variables: post-test performance levels, for instance, below average, average, and above average, and passing status in professional courses, pass or fail. Chi-square test: If the observed frequencies significantly differ under the hypothesis of independence, then the hypothesis of independence is rejected (Sapra & Saluja, 2021). A significant result from the Chi-square test indicates that post-test diagnostic performance is related to course outcomes. It thus gives a preliminary insight into the possible effectiveness of the program (Ben-Shachar et al., 2023).

This relationship was expressed numerically by computing Cramer's V whenever the Chi-square test was significant. If the data are nominal and the tables are more considerable than 2x2, then Cramer's V is the measure of association. It interpreted an effect size



from 0 (no association) to 1, meaning perfect association. This allowed for the practical significance of any relationship found. If the table is 2x2, then, by definition, the Phi coefficient was used to assess how strongly two such variables relate to each other.

Cramer's V and the Phi coefficient extended the Chi-square analysis with the actual strength of the relationship obtained in context. The study calculated the odds ratio (OR) and risk ratio (RR) to further interpret the relationship between the association of pre-test diagnostic scores with course success. The odds ratio contrasted the odds of passing professional courses for students scoring over average on the post-test compared with students scoring below average (Pepe et al., 2004). If the OR was greater than 1, that reflected a higher level of performance on the pre-test, which is associated with a greater chance of passing, while if the OR was less than 1, the opposite was indicated. Applying the risk ratio, different pretest performance groups established the relative risks of passing professional courses. This measure yielded a more precise understanding of the risk's magnitude, facilitating judgments on how much the enhancement program impacts the chances of passing (Chao et al., 2024). These measurements offered a multifaceted analysis of the relationship between post-test diagnostics and course results. The study provided sound evidence based on a set of statistical measures on the effect of the enhancement program, serving as a consideration point for further improvements and the development of academic support strategies in the future.

RESULT AND DISCUSSIONS

The results of six STREAM programs are based on a student population enrolled in one of the courses: Critical Thinking, Academic Integrity, Consumer Behavior, or Winter's Method in Excel. Altogether, 203 students were participating in the programs. In the Pre-test Performance, 117 students (58%) passed the initial diagnostic tests; 61 students (30%) failed the pre-tests; 25 students (12%) did not attend or take the pre-test. This means most of the students entered the programs with some minimal knowledge, although many needed to be improved. For the Post-test Outcomes, 132 students passed post-test assessments, 42 failed post-tests, and 29 did not take the post-test. The rise in passing rate from pre-test (58%) to post-test (65%) reflects that the programs positively impacted student performance.

Final Course Outcomes show a high success rate of 172 students (85%) who passed their professional courses. Only 31 students (15%) failed, withdrew, or were referred for additional study. The overall success rate here proves that the STREAM programs are doing very well in helping students establish success. Looking at individual courses, the Winter's Method in Excel was one of the most robust programs, with a 100% pass rate on professional courses. Academic Integrity also performed well, with nearly 96% of students passing their professional courses. Critical Thinking, which offered the three enhancement programs, showed mixed results but remained positive overall.

Overall, results revealed that the improvement programs were generally highly successful in improving student performance and getting students to course completion, with statistically significant gains in most programs from pretest to final course completion.

Table 1. STREAM Performance of business students in the seven programs

	Subject Code	Total # of Recipients (actual)	Source of Data	Pre-Test Diagnostics		Did not attend/ did not take the pre-test	Post-Test Results (ISP-KPI 2.3.2)		Did not take the post-test	Passed the professional courses (ISP-KPI 2.3.3)	LFE/LR/ Dropp ed/Failed
				Passed	Failed		Passed	Failed			
Critical thinking	7427	21	Pre-test	8	11	2	11	8	2	13	8
academic integrity	7484	27	Pre-test	18	9	0	19	3	5	26	1



Consumer behavior	7725	33	Pre-test	22	6	5	14	14	5	26	7
Winter's method in Excel	7759	19	Pre-test	14	2	3	13	4	2	19	0
Critical thinking	2692	51	Pre-test	38	5	8	35	4	12	47	4
Critical thinking	1661	52	Pre-test	17	28	7	40	9	3	41	11
TOTAL		203		117	61	25	132	42	29	172	31

The Contingency table below displays the result of the Post-test, with 132 passed, 42 failed Professional Courses, 172 passed, and 31 failed. Also depicted are the Test results of the Chi-square statistic of 4.1670 and P-value: 0.0412 at Degrees of freedom. Since the p-value (0.0412) is less than the standard significance level of 0.05, the null hypothesis of independence was rejected. There is a statistically significant relationship between the post-test performance and the course outcomes of the professional course. The Cramer's V value of 0.1051 presents a weak to moderate association between the variables. Thus, there is a statistically significant association between post-test performance and outcomes for professional courses, but that relationship in and of itself is modest in strength. Those who do well on the post-test are also more likely to pass all their professional courses, but other factors may explain much of the eventual course outcomes.

Table 2. Contingency Table

	Passed	Failed
Post-test	132	42
Professional Courses	172	31
Chi-square Test Results:		
Statistic	Value	Decision on Ho
Chi-square statistic	4.1670	Reject
p-value	0.0412	
Degrees of freedom	1	
Expected Frequencies:		
	Course Pass	Course Fail
Pre-test Pass	140.31	33.69
Pre-test Fail	163.69	39.31
Cramer's V	0.1051	

Based on in-depth statistical analysis, post-test performance correlates with professional course outcomes at the statistically significant level according to Fisher's exact test ($p = 0.0254$). In contrast, the two are relatively weak to moderate at the Phi Coefficient = 0.1234. Success rates have significantly improved from the post-test (75.86%) to professional courses (84.73%), indicating that the intervention programs worked well. The Odds Ratio was 0.2323, which means students who passed the post-test had a low probability of failing their professional courses. Conversely, the Risk Ratio of 0.8456 indicates a positive association between the two, although imperfect. All of these together pointed to the fact that performance at the post-test made quite a good prediction for success on a professional course. Still, it was not the sole determinant factor, thus suggesting the influence of other variables of continuous support systems, student motivation, or other interventions, most probably in determining students' final



academic outcomes. The moderate effect sizes and the trend of increasing success rates from post-tests to professional courses indicate that the programs STREAM work effectively and support student learning and achievement very well, even though intervention methods could be improved.

Table 3. Post-test Performance Correlates with Professional Course

Statistic	Value
Fisher's exact test p-value	0.0363
Measure of association	
Odds Ratio	0.5664
Risk Ratio	0.8953
Phi Coefficient	0.1051
Success Rate	
Post-test Success Rate	75.86%
Professional Course Success Rate	84.73%

The enhancement programs attest to great value in strengthening business students' academic foundations. The statistical analysis reveals a meaningful improvement in student performance from the pre-test to the last phase of professional courses, with an impressive success rate of 84.73 percent in professional courses. Such a high success rate underlines the program's effectiveness and indicates its power in preparing the students for more advanced business studies, leading to appropriate academic competencies.

Such programs are essential diagnostic and enhancement tools. The pre-test to post-test progression (which showed that success rates increased from 58% to 65%) illustrates how such programs help identify the gaps within the knowledge and correct them through appropriate instruction. Business education is essential since concepts such as critical thinking, academic integrity, consumer behavior, and analytical tools like Winter's method in Excel are crucial elements in advanced coursework and professional practices.

Structured scaffolding is intended to aid academic progression in support of enrichment programs. There is a statistical correlation between post-test performance and professional course outcomes, $\chi^2 = 4.9271$, $p = 0.0264$, suggesting that the programs offer what might be termed a positive scaffolding effect. Although the relationship is not highly associative (Phi Coefficient = 0.1234), it can indicate that the skills and knowledge acquired in the enrichment programs enhance the student's overall academic success, especially in the professional courses.

The programs also indicate specific effectiveness in some areas. For instance, the Winter's Method in Excel program achieved 100% passing the professional courses, while Academic Integrity scored 96%. Results for the above commend such targeted enhancement programs because they positively alter specific critical skill areas necessary for developing business students' professionalism and academic integrity. The enhancement programs work as a risk mitigation activity for business education. As shown in the study, only 15% failed or needed reassessment, and such an improvement program reduces academic risk, possibly students who would drop out. Since the learning process often requires a step-by-step sequence that builds on previous knowledge, this is particularly critical in a business education context.

The findings reveal that enhancement programs are not supplemental but part of practical business education. They offer necessary support structures that help pass through time in school to develop critical business-related skills and competencies while training. These programs should be maintained and even more extensive to continue supporting the development of business students at various levels, both academically and professionally.



CONCLUSION AND RECOMMENDATIONS

The STREAM program is designed to enhance the academic performance of business students. Data was gathered and established to indicate their positive impact on enhancing the performances and successes of the students in order to analyze the effectiveness of the enhancement programs. The statistical evidence comprises a chi-square test result $\chi^2 = 4.1670$ ($p = 0.0412$), and success rates improved from post-test (75.86%) to professional courses as 84.73%. This outcome justifies effectiveness towards supporting and enhancing learning and achievement among students. With diverse core skills programs, such as critical thinking, academic integrity, consumer behavior, and analytical tools, it showed strength in some areas. For example, programs under the core skills scored up to 100%. Although the moderate association between post-test performance and professional course outcomes presents multiple factors that might contribute to student success, the high % pass rate of 85% for professional courses indicates a substantial value of enhancement programs as educational interventions. These results validate the enhancement programs and are likely to be expanded as they successfully fill knowledge gaps, develop business students' competencies, and contribute significantly to their academic and professional development. The successful completion of these enhancement programs emphasizes their relevance within the framework of business education and emphasizes essential support structures that enable students to advance through their studies.

Based on these analytical findings of STREAM enhancement programs, it is possible to give several general recommendations about enhancing their strength in helping business students sustain academic success. This should first involve a comprehensive comparison of the different programs with the best success rates, such that their most successful implementations can be compared, such as Winter's Method in Excel and Academic Integrity, which was successful. In order to ascertain and replicate best practices across all enhancement programs. Second, since the statistical relationship between professional course and post-test performance is mild to moderate, it suggested that a system with better monitoring and support be structured, which would also take care of parameters outside of the current scope of student success, namely peer mentoring, increased availability of tutorials or intervention on students found to struggle at an early stage. To address the 15% of the students who fail or require further evaluation, an early warning system needs to be developed to indicate students before they move very close to crossing the critical stages; intervention strategies should also be tailored to that effect. Finally, with a proven positive impact on performance, it should be recommended that the scope of the enhancement programs be expanded to give more critical business skills and competencies while retaining checks for being in line with the regular curriculum to ensure that it is aligned with the current business needs for education. Instead, to further improve the pre-test to post-test improvement rates, more interactive and engaging learning methodologies should be introduced that may employ technologies with enhanced learning tools or real-world business case studies, and a regular feedback mechanism by students and faculty should be established for continuous refinement and improvement of program content and delivery methods.

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