

Brains Behind the Grades: Business Administration Students; Intelligence Predictor of Academic Success

Amabella Grace N. Siaton ¹
agsiaton@uc.edu.ph
0000-0001-9956-1606

Christopher Biore ¹
crisbiore@gmail.com
0000-0002-0062-0344

Judy Ann O. Ferrater-Gimena ¹
judygimena@gmail.com
0000-0001-5352-8253

Leonard Bitzusa ¹
lbitsuza@uc.edu.ph
0000-0002-0062-0344

1 – University of Cebu, Cebu City, Philippines

Publication Date: July 25, 2026

DOI: 10.5281/zenodo.21543845

Abstract

Education is producing graduates who possess the knowledge, competence, and skills needed by the business sector. To hurdle this challenge, business educators should determine the hypothesis that enables students to unleash their potential. Hence, this study determined the relationships among the intelligence quotient (IQ), achievement tests, and grade point average (GPA) of the Bachelor of Science in Business Administration (BSBA) students of the University of Cebu-Banilad, with the aim of formulating a proposed instructional intervention scheme.

The study utilized the predictive-relational research design using the primary data, which were the BSBA students' achievement test results, and the secondary data, the IQ test results, and grade point average (GPA). Thirty-two (32) respondents were BSBA-MM students of the University of Cebu-Banilad. The instrument used in the study was the researcher-made achievement test questionnaire. The IQ test results were obtained from the University Guidance Center, and the GPA was obtained from the University Registrar.

The majority of students had average intelligence quotients (IQs) and performed very well on achievement tests. Most of them have a *fair* academic performance, as indicated by their grade point average (GPA). Moreover, there is a significant relationship (high correlation) between intelligence quotient and achievement test, intelligence quotient and GPA, and achievement test and GPA. Further, a moderate positive correlation exists among GPA, IQ, and achievement test results. Therefore, it can be concluded that the intelligence (both innate and acquired) of Bachelor of Science in Business Administration students predicts their academic success at the university. Furthermore, to ensure that the university's educational activities lead to the attainment of democratized quality education, the academic heads and faculty members should adopt and implement the proposed instructional intervention scheme.

Keywords: *Business pedagogy, students' intelligence quotient (IQ), achievement test, grade point average (GPA), predictive-relational, Cebu City, Pgilippines*

INTRODUCTION

Education plays a crucial role in the development of any country, and it is to this end, educational reforms have been tied to economic development in the context of the Philippines. Philippine educational reforms have been shaped by its growing population and its response to the dynamic global demand for talent (Suarez et al., 2018). For the past decades, the country has been producing more and more graduates. It is already part of the culture of Filipino families that their children should get a college degree to land a good and stable job. Some families have even gone to the extent of sacrificing the education of their other children just to make sure one talented child finished college, hoping he or she would be their way out of poverty. The number of college graduates produced by public and private colleges and universities from 2007 (446,911) has increased by 60 percent to 703,327 in 2017 (Dulay, 2019).

Filipinos have a deep regard for education. Middle-class Filipino parents make tremendous sacrifices to provide and support secondary and higher education for their children. To earn a college degree is the ultimate goal and desire of every Filipino. It is part of the Filipino culture to value education for it brings confidence and helps convert the thinking into action to get ahead and be successful (Bondoc, 2017).

According to the statistics provided by the Commission on Higher Education [CHED] (2019), that there are a total of 3,212,542 students enrolled in higher education and 826,494 students, which represent 25.73 % of the total enrollees, are enrolled in Business Administration and related programs. For the academic year 2019-2020, there is a total of 3,408,425 students enrolled in higher education; from the data provided by the Commission on Higher Education (2020), 878,661 students are enrolled in Business Administration other related programs. This data shows that the Business Administration program is one the most popular college program in the Philippines.

CHED Memorandum Order No. 46 (2012) stipulates that the rationale for enhancing quality assurance in the Philippine education systems is to produce thoughtful graduates imbued with 1) values reflective of a humanist orientation (e.g., fundamental respect for others as human beings with intrinsic rights, cultural rootedness, and avocation to serve); 2) analytical and problem-solving skills; 3) the ability to think through the ethical and social implications of a given course of action; and 4) the competency to learn continuously throughout life-that will enable them to live meaningfully in a complex, rapidly changing and the globalized world while engaging their community and the nation's development issues and concerns.

The Bachelor of Science in Business Administration (BSBA) program utilizes an integrated approach to study the interrelationships among the different functional areas of business and examine how effective orchestration of these different components of business operations can lead to organizational success. At the end of the program, students are expected to appreciate the economic, social, technological, and legal environments within which all businesses must operate and possess the essential business knowledge, skills, values, and attitudes to lead an organization and achieve the desired results effectively. It is an interdisciplinary and problem-focused program comprising three integrated elements: core

business and management education courses, business administration, and major courses. Each major consists of courses designed to develop the critical thinking and analytical information/communication technology skill, human relation, communication, quantitative, and computer skills needed by the graduates to successfully serve as leaders in business organizations (Commission on Higher Education [CHED], 2017).

Likewise, in the Bachelor of Science in Business Administration program, various curriculum delivery methods should be employed to provide a learner-centered and outcomes-based education effectively. HEIs are allowed to design a curriculum suited to their contexts and mission provided that they can demonstrate that the same leads to the attainment of the required minimum set of outcomes, albeit by a different route. In the same vein, they have latitude in terms of curriculum delivery and terms of specification and deployment of human and physical resources as long as they can show the attainment of the program outcomes and satisfaction of program educational objectives can be assured by the alternative means they propose (Commission on Higher Education [CHED], 2017). It provides a diverse field relevant to preside daily and long-term business operations to ensure that things are running smoothly, efficiently, and profitably (E-Learners, 2020). Throughout the years, the BSBA program remains the most in-demand program in the Philippines. This program is designed to equip students with extensive knowledge about business operations and strategies. The program provides students with a clear understanding of the different facets of business, such as finance, marketing, operations, and human resources (Nucum, 2018).

It was also specified in CHED Memorandum Order No. 17 (2017) that the Bachelor of Business Administration program utilizes an integrated approach to study the interrelationships among the different functional areas to business and examine how the different orchestration of the different business components. The Business Administration students are expected to appreciate the economic, social, technological, and legal environments within which all businesses operate and possess the fundamental business knowledge, skills, values, and attitudes to lead an organization and achieve desired results effectively. According to Steele (2018), Business Administration students just learned to maximize the value of every topic. It is also imperative that business students already know what field of business they will focus on. This action will determine the major courses and the specifics that students will focus on and specialize in.

Almost 25.76% of Filipino college students are enrolled in Business Administration and related programs (Commission on Higher Education [CHED], 2020). Business Administration students want to earn a degree with career potential. It has an expansive career potential in which business graduates can move into different roles or work environments. With these opportunities waiting, business students aim to graduate and earn the degree as soon as possible (Purdue University Global, 2020). Business students also encountered some challenges in completing their academic requirements. Despite the growing number of students in business studies, present-day society is fraught with the economic crisis, disequilibria, and waste, which manifest at society, group, and individual levels. Most of the problems involve focusing on short-term profitability, fragmentation and specialization, and lack of connection with the students' level of knowledge and the curriculum (Calin, 2015).

Another issue that higher education now is facing is that it habitually fails to produce graduates with industry-standard competencies (Jorge, 2011). There is also an inadequacy in the curriculum content. Most of the courses do not cover the scope of knowledge and skills required to prepare business education teachers today. Highly needed courses are not available in the curriculum. There are also included in the course content, which is not relevant. A business education program should include courses that would prepare the student for saleable skills and help them understand the economic system and how a business operates. It was also geared towards helping people acquire knowledge and attitude or value that would enable them to function in the world they live in (Ajisafe et al., 2015).

Aside from the issues mentioned above faced by higher education, there are also problems in terms of assessing the students. Among the common problems are lack of proper training for examiners, poorly designed exams, and inadequate statistical evidence about the performance of the examination or its component. Standards such as pass marks and degree grade boundaries are seldom set using a proper method. Instead, they are often predetermined and set out in regulations without regard to the content or difficulty of the questions. Many assessments in higher education are found to be not fit for purpose (The World University Rankings, 2015).

The issues in higher education can be addressed by providing quality education. Stakeholders must work together and must commit to providing quality education that will produce high-quality graduates. In order to achieve this, there is a need to study how students' intelligence quotient, achievement test result, and grade point average correlates with each other. According to Kaya et al. (2015), intelligence and achievement are two different but interrelated constructs. An enhanced understanding of the relationship between intelligence, both verbal and nonverbal, and achievement may improve the identification of gifted and talented children and help the higher educational institutions design the curriculum based on the current need.

Intelligence and academic achievement both are two faces of the same coin. Each child is unique and different in their mental ability. Different level of intelligence leads to increase the different level of learning abilities. The different levels of intelligence influence different levels of performance and students' curriculum achievement (Dandagal & Yarriswami, 2017). Few students invest more energy in overhauling for their test, and a few pupils are naturally brighter than others. The teacher will decisively choose to examine the influence of modification time and the student's intelligence on the test execution of the 100 pupils. There exists a positive relationship between IQ score and GPA. A high rate of behaviors related to GPA has a significant effect on children's performance in school. Their verbal comprehension, perceptual reasoning, working memory, and processing speed are noted in adulthood (Ochieng, 2015).

Regardless of having a more extensive professional potential for BSBA understudies, advanced education currently is confronting a test of constant inability to deliver graduates with industry-standard capabilities. The issues in advanced education can be tended to by giving quality schooling by cooperating in giving quality instruction that will create top-notch graduates. Therefore, the challenges faced by the higher education system in the Philippines, specifically producing a high quality of graduates that will fit the industry's need, call for a need to examine

various dimensions in the current curriculum, including the Bachelor of Science in Business Administration program. The research could help the higher educational institutions to develop and improve the curriculum based on the current needs of the students. The current level of students' needs can be viewed by assessing how students' IQ, achievement tests, and GPA correlate. The end goal of the study is to be able to come up with an intervention scheme to ensure that the outcomes-based educational system is achieved.

FRAMEWORK

This study is anchored on the triarchic theory of intelligence, which explains the practical, distinct, analytical types of intelligence (Culatta, 2020). This theory is supported by Gardner's theory of multiple intelligences, which states that an individual's intelligence can be through language, logical-mathematical analysis, spatial representation, musical thinking, or the use of the body to solve problems (Marenus, 2020). In addition, Guilford's structure of intellect theory posits that an individual can think and show it visually (Madhav University, 2018).

The triarchic theory of intelligence, proposed by Robert Sternberg, posits three distinct types of intelligence: practical, creative, and analytical. Practical intelligence is the ability to get along in different contexts. Practically intelligent people are especially adept at behaving successfully in their external environment. Creative intelligence is the ability to generate new ideas. Analytical intelligence is the ability to evaluate information and solve problems. Analytical intelligence is used to solve problems and is the kind of intelligence that is measured by a standard IQ test. The triarchic theory is comprised of three sub-theories, each of which relates to a specific kind of intelligence: the contextual sub-theory, which corresponds to practical intelligence, or the ability to function in one's environment successfully; the experiential sub-theory, which corresponds to creative intelligence, or the ability to deal with novel situations or issues; and the componential sub-theory, which corresponds to analytical intelligence, or the ability to solve problems. (Vinney, 2020). The triarchic theory of intelligence is a general theory of human intelligence. This theory has been used to explain children's exceptional intelligence and critique existing intelligence tests (Culatta, 2020).

The triarchic theory of intelligence is based on a broader definition of intelligence than is typically used. In this theory, intelligence is defined as achieving success in life based on one's standards and socio-cultural context. The ability to achieve success depends on capitalizing on one's strengths and correcting or compensating for one's weaknesses. Success is attained through a balance of analytical, creative, and practical abilities—a balance that is achieved in order to adapt to, shape, and select environments. Analytical, creative, and practical intelligence are its three aspects. Analytical intelligence is involved when applied intelligence components are used to analyze, evaluate, judge, or compare and contrast. Research on the components of human intelligence has shown that although children generally become faster at information processing with age, not all components are executed more rapidly. Sternberg and Lubart found that creativity is relative, although not wholly, domain-specific. In other words, people are frequently creative in some domains but not in others. Practical intelligence involves individuals applying their abilities to the kinds of problems they face in daily life, such as on the job or at home. They have defined this construct as what one needs to know, which is often not even

verbalized, to work effectively in an environment in which one has not been explicitly taught to work (Reyes, 2016).

The theory was groundbreaking, as it was among the first to go against the psychometric approach to intelligence and adopt a more cognitive approach. Sternberg's definition of human intelligence is a mental activity directed toward purposive adaptation, selection, and shaping of real-world environments relevant to one's life. This explanation holds that intelligence is the extent to which an individual adapts to environmental changes throughout their lifespan (Surhone et al., 2010).

According to the study by Howard et al. (2001), high analytic abilities were predictive of content understanding but not of the transfer of problem-solving skills. High creative abilities were associated with problem-solving but not with performance on content understanding. In terms of science-related attitudes, students who were dominant in practical abilities had significantly more positive posttest attitudes than those dominant in analytic abilities.

Gardner's theory of multiple intelligences suggests that traditional psychometric views of intelligence are too limited. Gardner proposed eight types of intelligence and suggested the addition of a ninth, existential intelligence. While a person might be influential in a specific area, such as musical intelligence, he or she most likely possesses a range of abilities (Cherry, 2019).

Gardner, who developed the theory, broadens the definition of intelligence and outlines several distinct types of intellectual competencies. Under this theory, intelligence was defined as the biopsychological potential to process information that can be activated in a cultural setting to solve problems or create valuable products. According to this theory, intelligence has eight inclusion criteria: linguistic intelligence, logical-mathematical intelligence, spatial intelligence, bodily-kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence, and naturalist intelligence (Marens, 2020).

This theory proposes that individuals were able to know the world through language, logical-mathematical analysis, spatial representation, musical thinking, the use of the body to solve problems or make things, an understanding of others, and an understanding of ourselves. Individuals differ in the strength of these kinds of bits of intelligence and in how they are invoked and combined to carry out different tasks, solve various problems, and progress in different domains. The diversity of intelligence should shape how people are educated. It has challenged an educational system that assumes that everyone can learn the same materials in the same way and that a uniform, universal measure suffices to test student learning. By not embracing multiple teaching methods tailored to different learning styles, students often leave school feeling undervalued (Cornerstone University, 2018).

The theory has become the touchstone of education. Embracing a wide array of human talents that significantly contribute to our intellectual and cultural life, MI theory offers a broader definition of intelligence than is measured by standard IQ tests. MI theory supports and celebrates the diversity of children's strengths in school and other learning environments. Multiple Intelligences across the world's cultures provide a valuable resource for teachers and

administrators working with diverse student populations. In addition, the experiences of exam-driven countries such as China and Japan will prove instructive to professionals tasked with improving both teaching and test scores (Chen et al., 2009).

Multiple intelligences theory describes the factors that influence a child's cognitive development. It offers insights into different relationships between human intelligence, technology, and practical instruction. It holds that each separate intelligence is a viable, distinct pathway to learning. There are ways to know that they can operate independently yet act in concert with even greater power. These bits of intelligence are not to be confused with talents, gifts, aptitudes, or learning styles. Talents, gifts, and aptitudes connote abilities above and beyond the realm of simple human understanding. Learning styles are fixed modes of understanding that learners use regardless of the instructional context. Bits of Intelligence is more than either of these. These are legitimate conduits of cognition that learners can flexibly apply across the curriculum in varied contexts (McKenzie, 2005).

Also, the structure of intellect theory by Joy Paul Guilford states that human intelligence consists of three components: operations, contents, and products, which are known as dimensions. Each of these dimensions plays a crucial role in determining students' intellectual abilities. It blends cognitions with mathematics to explore the nature of human intelligence. The structure of intellect operations is cognition, memory, convergent production, divergent production, and evaluation. Symbolic, semantic, visual, auditory, and behavioral are the structures of intellectual contents. The structure of intellectual products consists of units, classes, relations, systems, transformations, and implications. This theory also explains that reasoning and problem-solving skills comprise thirty intellectual activities, including convergent and divergent operations. Memory operations encompass 30 distinct intellectual abilities or skills. Language skills comprise 30 distinct abilities, and decision-making comprises 30 intellectual abilities (Pappas, 2020).

Guilford's structure-of-intellect theory is intended to be a general theory of human intelligence. Its primary application has been in personnel selection and placement. Guilford researched and developed a wide variety of psychometric tests to measure the specific abilities predicted by SI theory. These tests provide an operational definition of the many abilities proposed by the theory. Furthermore, factor analysis was used to determine which tests appeared to measure the same or different abilities. This theory holds that human abilities are differentiated into increasingly complex systems as education becomes more advanced. Intelligent education is intelligent education (Madhav University, 2018).

This theory is used as an assessment tool for students. It can identify learning disabilities and provide enrichment for gifted students. This learning theory focuses on one's ability to think and show it visually. Initially, the theory comprised 120 components because Guilford had not separated the figural content. Now, it consists of 150 components. According to this theory, each ability corresponds to a particular operation in a particular content area and results in a specific product, such as the comprehension of figural units or the evaluation of semantic implications. This theory suggested that people paid more attention to and thought more effectively about different kinds of information. This information is visual, auditory, and symbolic. Visual and

auditory information is directly from the senses of sight and hearing. Symbolic items are words and symbols that generally convey some meaning (Capareda, 2012).

The variation in college students' academic performance was also explained in the study by Thayamathy et al. (2018), who posit that undergraduates' academic performance may depend on several factors and may vary from area to area and over time. Identification of such factors is very helpful in developing their education. Based on the results of this study, it can be concluded that the academic performance of undergraduates depends on gender, stream of study, and proficiency in the mother language and English. Female students' performance is higher than that of male students, while students in the biological stream perform better than those in the physical stream. Language fluency, especially in English, positively affects academic performance within the university during the undergraduate period. Even though it is known that academic performance depends on gender and stream of study, there is no way to improve performance based on these factors because changing gender or stream of study is not possible.

Intelligence quotient is a measure of a person's reasoning ability. It assesses how well someone can use information and logic to answer questions or make predictions. IQ tests begin by assessing this through measures of short- and long-term memory. IQ tests can also help identify students who would do well in fast-paced "gifted education" programs. IQ tests can predict how well people will do in particular situations (Stevens, 2016).

The definition of intelligence may seem simple, but the study and measurement of human intelligence are some of the most controversial subjects in psychology. In measuring human intelligence, the focus has been on differences between people, what it means for one person to be more intelligent than another, and how such differences might have arisen, obscuring efforts to understand the general nature of intelligence. These are fundamental questions, still widely debated and misunderstood. Human intelligence is something all humans share, which makes humans superior and different from other animals. It involves language and the capacity to develop and transmit culture, think, reason, test hypotheses, understand rules, and so on (Mackintosh, 2011).

An achievement test determines how well a specific individual's intelligence and knowledge are in a particular subject. Achievement tests are often used in educational and training settings. Standardized achievement tests are also widely used in educational settings to determine whether students have met specific learning goals. Each grade level has certain educational expectations, and testing determines if schools, teachers, and students meet those standards. Achievement tests play an essential role in education, but they have also been criticized at times. However, such tests provide a reasonably efficient way to gauge how well students are performing (Cherry, 2020).

Modern societies rely on written tests. Achievement tests play an essential role in modern societies. It attempts to measure the knowledge acquired in a particular subject. These are used to evaluate schools, assign students to tracks within schools, and identify weaknesses in student knowledge. Achievement tests are used to sift and sort people, evaluate schools, and assess the performance of entire nations. Achievement tests were developed to measure general knowledge

useful inside and outside the classroom. However, achievement tests are typically validated circularly, using IQ tests and grades rather than their ability to predict important life outcomes. Some have recognized this circularity and have argued that achievement tests miss essential skills. These are some reasons achievement tests have failed to fulfill their purpose (Heckman et al., 2015).

A general point average is a number that indicates how well an individual scored across courses. It pertains to an individual's GPA during his studies, usually on a scale of 1.0 to 4.0. It also shows the student's overall grade, either high or low. This number is then used to assess whether the student meets the standards and expectations set by the degree program or university. It is the only metric or calculation showing how good a student is. Organizations, scholarship committees, clubs, and universities want high-achieving, hard-working students, and typically, they look for someone with a high GPA. GPA is important, but it is not everything (Potter, 2020).

Intelligence quotient, grades, and scores on achievement tests are widely used as measures of cognition. Universities still use IQ and achievement tests to assess students' intelligence. Both grades and achievement test scores have independent predictive power above and beyond IQ because they capture aspects of personality, according to Borghans et al. (2016). The theories, studies, and literature examine how intelligence quotient and achievement test scores can affect the overall grade point average of BSBA students. Furthermore, it provides a broader understanding of how these are related to one another and thus helps readers of this paper better appreciate the importance of IQ, achievement tests, and GPA to students' development.

Kpolovie (2016) opined that a student's academic or cognitive achievement on one subject matter tends to be comparable to the student's academic achievement on other cognitive tasks. However, these are entirely different subject areas. Intelligence is the general mental ability factor that accounts for the significant correlation between the two subject areas, as intelligence correlates with each subject area. These findings corroborate scientific discoveries that students' academic achievement ratings are positively correlated.

The study by Watson and Monroe (2009) revealed that the best-predicting model for academic achievement included only two variables: intelligence and teacher perception of communication apprehension, with the latter showing a slight association with achievement. A predictor model based on intelligence and teacher perception of communication apprehension was slightly better than one based on intelligence alone. Intelligence correlated significantly with achievement, and teacher perception of communication apprehension correlated negatively with achievement and IQ. Communication apprehension did not correlate significantly with either achievement or intelligence.

The study by Adams and Blair (2019) also found that effective time management is essential for better academic performance. However, many students struggle to balance their studies with their day-to-day lives. It was found that although time management behaviors seemed to influence academic performance, they accounted for only a small percentage of the cumulative GPA's variability, suggesting that other factors, such as study skills, problem-solving,

socioeconomics, and personality, need to be explored. The study also suggests that other such factors may affect students' chances of success in higher education and therefore warrant investigation.

The study by Plant et al. (2005) proposed a model in which college performance, both cumulatively and in the current semester, was jointly determined by prior knowledge and skills and by factors indicating the quality and quantity of study. The findings support the proposed model and indicate that the amount of study only emerged as a significant predictor of cumulative GPA when the quality of study and previously attained performance were considered. The findings are discussed in terms of the insights provided by applying a deliberate practice framework to academic performance in a university setting.

OBJECTIVES OF THE STUDY

This study examined the relationships among intelligence quotient (IQ), achievement tests, and grade point average (GPA) among Bachelor of Science in Business Administration students at the University of Cebu-Banilad. The results served as the basis for a proposed instruction intervention scheme to improve the quality of instruction in the university.

METHODOLOGY

This study employed a descriptive correlational research design to determine the significant relationships among intelligence quotient (IQ), achievement tests, and grade point average (GPA) of Bachelor of Science in Business Administration students at the University of Cebu-Banilad.

Correlational research is a type of non-experimental research in which the researcher measures two variables and assesses the statistical relationship (i.e., the correlation) between them with little or no effort to control extraneous variables. Correlation is also used to establish the reliability and validity of measurements (Price et al., n.d.).

The study was conducted at the College of Business and Accountancy of the University of Cebu-Banilad, Cebu City, Philippines.

The data used in the study were IQ test results, achievement test results, and grade point average for AY 2019-2020, second semester. The data on intelligence quotient (IQ) were obtained from the Guidance Office, while the data on grade point average (GPA) were obtained from the Registrar's Office.

The research participants were the Bachelor of Science in Business Administration students majoring in Marketing Management (BSBA-MM) of the University of Cebu-Banilad. Utilizing the purposive sampling technique, thirty-two (32) students served as research participants in this investigation. Twenty-four (24) participants were third-year students, and the other eight (8) participants were BSBA-MM students.

The research instrument used in the study was a researcher-designed 50-item achievement test questionnaire.

The researcher also sent another letter to the Head of the Guidance Office requesting permission to administer an IQ test to the BSBA students. The achievement test was conducted online on December 18, 2020, using eThink's Moodle Learning Management System, the university's official LMS. Before administering the achievement and IQ tests, the researcher oriented the research participants on the study's objectives. After which, they were asked whether they would be willing to participate in this investigation. Those students who signified their willingness were asked to sign an informed consent form. They were also informed that participation in the study was voluntary and that they could withdraw at any time without cost. The data gathered was stored on the researcher's personal laptop, protected by a password. Such data will be deleted after five years.

The data gathered in the study were analyzed using the following statistical tool. Frequency counts and percentages were calculated to present the achievement test, intelligence quotient test, and grade point average results of the respondents. Pearson-R Coefficient Correlation was calculated to determine the significant relationship between the following: (a) the IQ and the achievement test performance of the BSBA students; (b) the achievement test performance and the GPA of the BSBA students; and (c) the IQ and grade point average of the BSBA students. Further, multiple regression was used to determine the correlation between the paired variables.

The research strictly adhered to the data privacy protocols and ethical research principles. All the respondents signed the informed consent form before participating in the study. The informed consent form has two parts: the information sheet on the study's scope and methodology, and the data privacy agreement/certificate of consent. In the context of beneficence, the research provided benefits to students, college professors, universities, and other stakeholders through the instruction intervention scheme, which would guide them toward a more effective BSBA program. In accordance with the principle of non-maleficence, the investigation was undertaken without harming the participants' reputations. All the data gathered in the study were treated with the utmost confidentiality and used solely for academic purposes. The data and files were destroyed after analysis. Lastly, in accordance with the principle of justice in ethics, all research participants were treated equally. The participants were treated with the same degree of respect. The researcher ensured that the method for selecting participants was fair and unbiased. Since the achievement test was conducted online, all electronic data and results were stored through the university's official learning management system to ensure data security. After the result was analyzed and recorded, it was electronically deleted and destroyed.

RESULTS AND DISCUSSIONS

This section presents, analyzes, and interprets the gathered data. Three (3) parts are presented. The first part presents the achievement and IQ test results, as well as the grade point average, of the Bachelor of Science in Business Administration students for the second semester of the School Year 2019-2020. The second part presents the results of the test of significant

relationship on the following: (a) the IQ and achievement test performance of the BSBA students; (b) the achievement test performance and the GPA of the BSBA students; and (c) the IQ and the grade point average of the BSBA students. The assessment of the strength of the relationship between paired variables and predictive variables is presented in the last part.

This section presents the data on the intelligence quotient (IQ) profile, achievement test performance, and grade point average of the Bachelor of Science in Business Administration during the second semester of the School Year, 2019-2020.

Table 1. Intelligence quotient (IQ) of BSBA students (n= 32)

Indicators	Frequency	Percentage
Above Average	1	3.12
Average	20	62.50
Below Average	11	34.38

Legend: 71 and below-Low; 78-87 Below Average; 88-111 Average; 112-127-Above Average; 127 and above Above Average

Table 1 shows the intelligence quotient (IQ) profile of the Bachelor of Science in Business Administration (BSBA) students. Out of the thirty-two (32) research participants, twenty (20) or 62.5% had an average IQ, while only eleven (11), comprising 34.38% of the BSBA students, had below average IQ. It can be noted that only one (1), consisting of 3.12% of the research participants, had an above-average IQ. The primary data indicate that the majority of Bachelor of Science in Business Administration (BSBA) students had typical or mediocre IQ levels.

A business program specializing in marketing management touches many areas. It covers the basic principles of marketing and holistic business approaches. It requires strategic and tactical management studies that require students to know how to position the essential marketing mix and quantify each decision, both pros and cons, to determine business strategy. Having an average to above-average IQ level is an advantage.

Sales, finance, and real estate are among the top ten professions that require a high IQ. It would be easier to deploy psychological strategies and to develop a deeper understanding of the products and strategies if an individual has an average to high IQ. Also, in finance and real estate, the complexities of financial jargon and technical know-how will make it harder to succeed with a good IQ (Becker, 2018). These professions are among the program's educational objectives for the Bachelor of Science in Business Administration. This is one of the reasons why it would be advantageous for a business student to improve his IQ, as it will equip him to prepare for his future profession.

The Association of Test Publishers (2021) also stated that intelligence tests could uncover valuable information about cognitive abilities that assist educators in helping students develop their potential. It is helpful to know how to make updates and develop the current curriculum and program design. Intelligence tests are significant determinants of the appropriate teaching approach to use in the class, ensuring that students grasp the subject and achieve the intended learning outcomes.

This section presents the students' academic performance based on their grade point average (GPA) for the second semester, S. Y. 2019-2020.

Table 2. Distribution of students' academic performance based on GPA (n= 32)

Academic Performance	Frequency	Percentage
Good	1	3.12
Fair	30	93.75
Poor	1	3.13

Legend: 1.0-Excellent;1.1-1.5-Very Good;1.6-2.5-Good; 2.6-2.9-Fair; 3.0-Passing;5.0-Failed

As shown in Table 2, out of thirty-two (32), thirty (30), comprising 93.75% of the research participants, had a fair academic performance based on their grade point average GPA. Further, the data show that only 1 (3.12%) had good academic performance, while another 1 (3.12%) had poor academic performance. It can also be noted that none of the BSBA students showed either superior or failing academic performance. It could be inferred that the majority of Bachelor of Science in Business Administration (BSBA) students at the University of Cebu-Banilad during the school year 2019-2020 did not perform impressively in the courses they enrolled in during the aforementioned semester.

Brown and Rich (2020) explained that there are significant changes in business organizations and industries in the 21st century, leading to an ever-greater interest in and demand for managers with traditional subject knowledge and technical skills, as well as individual business skills. To meet these demands, business schools are under pressure to adapt their courses appropriately and to innovate. For an undergraduate degree in business management, this includes the degree structure, the subjects covered, the teaching methods used, and the overall student learning experience. The increasing demand for knowledge and technical expertise to cope with significant changes in the business industry has also brought major changes to the business education structure and curriculum. This has resulted in higher standards for students who need to comply to maintain the quality of education and produce quality business graduates that the business schools commit to producing.

A grade point average is essential because it is evidence of an individual's academic achievement. It is the only thing that demonstrates intellectual ability and measures a specific person's efforts in their knowledge and education. It is also one of the indicators of a person's performance in learning, especially in the field they are specializing in. The GPA is also considered one indicator of the kind of student an individual is, whether they are hardworking, ambitious, or a slacker (The College Monk, 2021).

Table 3. Achievement test results (n= 32)

Achievement Test	Frequency	Percentage
Excellent	6	18.75
Very Good	19	59.38
Good	5	15.62
Fair	2	6.25

Legend: 0-10-Poor; 11-20-Fair; 21-30-Good;31-40-Very Good;41-50-Excellent

The data show that nineteen (19), comprising 59.38% of the thirty-two (32) research participants, had a very good performance, while only two (2), comprising 6.25%, had a fair performance during the second semester of the School Year, 2019-2020.

It can be inferred that the majority of Bachelor of Science in Business Administration majors in Marketing Management (BSBA-MM) performed remarkably well on the achievement test. It can be noted further that only a few obtained excellent marks in the said examination, which suggests mastery in the courses they had taken in the BSBA-MM curriculum.

Further, the preceding data indicate that most of the research participants' scores were within the range of 31-40. This result means that they have a broad knowledge of the concepts, principles, and skills in the marketing management area of the business administration discipline. On the other hand, there is a need to implement an intervention activity to improve students' achievement test results towards the excellent level, since only six (6) of them scored within the range of 41-50.

Chakma (2021) posits that achievement tests are significant. It is instrumental in measuring an individual's minimum abilities, primarily in their area of specialization. It is also used to evaluate the educator's proficiency and the effectiveness of different teaching methods, and can help select the most effective teaching methodology. Thus, the achievement test results are items that need to be considered in the development, amendment, and revision of the program curriculum. This type of assessment assists in learning. A student knows how much he has studied and how much he has yet to study.

In addition, Stecker and Fuchs (2010) revealed that achievement tests are significant in individual progress monitoring. It is essential, especially in curriculum development. It also reveals that students whose instructors tailored instructional adjustments based on the achievement test results and identified the program areas that needed strengthening performed significantly better. This depicts the importance of a timely, objective achievement assessment and the proper interpretation of the results, both of which are useful for program development.

This section presents the results of the test of significant relationship for the research participants' intelligence quotient, second-semester GPA for the School Year 2019-2020, and performance in the achievement test.

The part displays the results of the test of the significant relationship between the research participants' intelligence quotient and their performance during the achievement test.

Table 4. Results on the test of significant relationship between the research participants' intelligence quotient and achievement test ($n = 32$; $\alpha = 0.05$)

Paired Variables	Pearson r Computed Value	Pearson r Critical Value	df	Decision	Interpretation
Intelligence Quotient and Achievement Test	0.682	0.361	28	Reject	Significant

Legend: 0.0 to ± 0.20 -Slight Correlation; ± 0.21 to ± 0.40 -Low Correlation; ± 0.40 to ± 0.60 Moderate Correlation; ± 0.61 to ± 0.80 -High Correlation; ± 0.81 to ± 1.00 -Very High Correlation

The data in Table 4 show a significant relationship between the research participants' intelligence quotient and their achievement test performance, as indicated by a Pearson r of 0.682, which exceeds the critical value of 0.361. This result leads to the rejection of the null hypothesis.

Moreover, the computed value of Pearson's r (0.682) indicates a strong correlation between the two paired variables. These results indicate that the Bachelor of Science in Business Administration, major in Marketing Management, students' intelligence quotient (IQ) level relates to their performance on the achievement test. So, the higher the student's intelligence quotient, the higher the probability of obtaining a higher mark in the achievement exam.

Chandra (2013) found that intelligence influences students' academic achievement. The student with a high IQ achieves better academically than the student with an average IQ. The high-IQ student will have a greater grasp, retention, recall, and understanding than an average student. So he will perform better in academics. A bright student will get high marks and perform well. The results of the study show that the average-IQ student performs better than the low-IQ student. An average-IQ student will be a better learner than a slow learner. Hence, the academic achievement of the average-IQ child will be higher than that of the low-IQ child. A student with a high IQ will score better than one with a low IQ.

On the other hand, those children with lower IQ are considered slow learners. A student with a high IQ is a fast learner. He will understand, grasp, and learn the concepts more effectively. Academic performance needs intelligence.

The data in Table 5 present the results of a test of the significant relationship between research participants' academic performance, as measured by their grade point average (GPA), and their achievement test performance.

Table 5. Results on the test of significant relationship between the research participants' academic performance and their achievement test performance ($n = 32$; $\alpha = 0.05$)

Variables	Pearson r Computed Value	Pearson r Critical Value	df	Decision	Interpretation
GPA and Achievement Test	0.637	0.361	28	Reject	Significant

It is shown that there is a significant relationship between participants' academic performance (GPA) and their performance on the achievement test, as indicated by a Pearson r of 0.637, which exceeds the critical value of 0.361. This result leads to the rejection of the null hypothesis.

In addition, the Pearson r of 0.637 indicates a strong correlation between the two paired variables. The student's performance in the subjects taken in the Bachelor of Science in Business Administration major in Marketing Management (BSBA-MM) curriculum is a significant indicator of the student's level of competence in their chosen field.

Borghans et al. (2016) stated that grades and scores on achievement tests are widely used to measure cognition. Achievement tests are widely used to measure the traits required for success in school or life. It is essential to know what they measure to design effective policy and to use these measures to evaluate schools and teachers, including evidence on teacher effectiveness and its consequences. Understanding the sources of differences in the test scores and grades used to explain the black-white achievement gap. Grades and achievement tests are generally better predictors of life outcomes than pure measures of intelligence. It is essential to understand the relationship between grades and achievement tests to describe how cognitive skills are affected. This suggests that the shreds of evidence on the relationship between cognitive skills and a variety of essential life outcomes are embedded in grades and achievement tests.

Table 6 present the results of a test of the significant relationship between research participants' intelligence quotient and their academic performance, as measured by grade point average (GPA).

Table 6. Results on the test of significant relationship the research participants' intelligence quotient and academic performance ($n = 32$; $\alpha = 0.05$)

Variables	Pearson r Computed Value	Pearson r Critical Value	df	Decision	Interpretation
Intelligence Quotient and GPA	0.628	0.361	28	Reject	Significant

There is a significant relationship between research participants' intelligence quotient and academic performance, based on their grade point average (GPA), as denoted in the computed value of Pearson r of 0.628, which is greater than the critical value of 0.361. This result leads to the rejection of the null hypothesis.

Further, the data showed that the computed Pearson r of 0.628 also indicates a strong correlation between the two paired variables. This data indicates that students with a high IQ are more likely to perform better in the courses they enroll in at the university, following the BSBA curriculum.

Roth et al. (2015) elucidated that intelligence is the strongest predictor of scholastic achievement. Intelligence can be measured by determining the intelligence quotient, and scholastic achievement is represented through grades. Knowing the relationship between the two variables and how they affect each other is very important. Educational policy and society are also very interested in it, as it is a prerequisite for scholastic success. The study investigated the population correlation between intelligence tests and school grades. The study found that the relationship between IQ and school grades varies across school subject domains, grade levels, the type of intelligence test used in the preliminary study, and the year of publication. In contrast, gender did not affect the magnitude of the relationship.

This section presents the assessment data on the strength of the relationship between the research participants' intelligence quotient and academic and achievement test performance, which are the predictive variables of the Bachelor of Science in Business Administration major in Marketing Management students' educational success.

Table 7. Multiple regression analysis

Predictor	Coefficient t	Estimate	Standard Error	t-statistic	P- value
X1	β_1	0.0052	0.0049	1.0671	0.0294
X2	β_2	0.003	0.0069	0.4296	0.0470
R^2	=	0.5921			6

Table 7 shows that the p-value of the x_2 statistic (0.04706) is less than 0.05, indicating a significant relationship between y and x_2 . There are positive and moderate correlations between x_1 and x_2 , x_1 and y , and x_2 and y . This result indicates only that the variables move in tandem: as one variable increases, the others increase as well.

On the other hand, the coefficient of determination (R^2) is 0.5921, indicating a good model fit. The proposed multiple linear model equation is $y = 2.6523 - 0.0052 X_1 - 0.003 X_2$. This data implies that higher intelligence quotient (IQ) and achievement test scores are associated with higher grade point averages (GPAs), indicating remarkable academic performance in the courses taken.

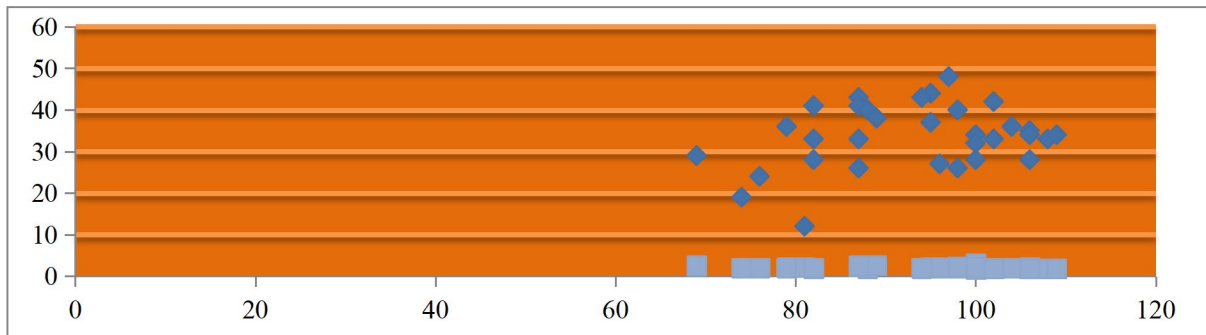


Figure 1. Multiple Regression Analysis

As shown in the scatter plot in Figure 1, moderate positive correlations exist between x_1 and x_2 , x_1 and y , and x_2 and y . Based on the model, the p-value for x_1 (0.02947) is less than 0.05. This data shows a significant relationship between variables y and x_1 .

Kappe and Van der Flier's (2012) study found that intelligence and conscientiousness are the best predictors across a broad spectrum of academic achievement measures and explain five times as much variance in GPA. Since IQ and achievement tests affect students' grades, it is essential to determine how to improve IQ and achievement test scores. It was found out that the student's level of conscientiousness can do so. The practical implication is that institutions of higher education should collect personality data on students at the outset and then provide appropriate support. Highly conscientious students who are organized and internally motivated might potentially be offered more challenging honors programs with corresponding special commendations on their diplomas. In contrast, students who score low on conscientiousness would receive more structure through student study groups, frequent deadlines, shorter assignments, group assignments, clearly defined learning goals, and fewer second chances for passing examinations.

CONCLUSIONS

The student's intelligence is the primary gauge of their potential in the class and of their overall academic success. So, higher educational institutions' commitment to providing quality business education can be achieved through an objective assessment of the factors that lead students to attain high academic performance. Moreover, assessments are useful for identifying instructional delivery areas that require reinforcement, such as extracurricular programs that aim to help learners comprehend and apply their learning in tangible ways. Also, the most appropriate and effective teaching approach will be determined by conducting a regular study of the association between students' competence and their grade point average (GPA).

TRANSLATIONAL RESEARCH

The business arena is a dynamic environment. Business philosophies from years back are just part of history now because business environments, both internal and external, are complex and sensitive to changes. This program of action leads to the development of standards that the business industries require for business and management practitioners. Producing high-quality



graduates who are industry-ready is the university's ultimate goal. The intelligence quotient (IQ), grade point average (GPA), and achievement test results are a few indicators of whether this goal is realized. To ensure the university's ultimate goal is realized, proper instruction must be implemented. Instruction is crucial, as it is a way to identify and ensure that learning objectives are achieved, and students must be able to attain the specified competencies of the courses to complete such programs. The proposed instruction intervention scheme presented includes the plan design and strategic implementation. The key result areas cover not only the students' side but also the educators' side to mobilize the said plan. This proposal is intended based on the findings of the study.

The objective is to improve students' business competencies. This objective will be quantified by increasing the IQ, GPA, and achievement results of BSBA students.

LITERATURES CITED

- Adams, R. V., & Blair, E. (2019). Impact of time management behaviors on undergraduate engineering students' performance. *SAGE Open*, 9(1), 215824401882450. doi:10.1177/2158244018824506.
- Ajisafe, O., Bolarinwa, K., & Tuke, E. (2015). Issues in business education program: Challenges to national transformation. Retrieved on November 19, 2020 from <https://bit.ly/2UINKqx>.
- Association of Test Publishers. (2021). Questions about testing in schools. Retrieved on July 24, 2021 from <https://bit.ly/2WhCCoz>.
- Becker, S. (2018). 10 jobs where employees tend to have the highest IQs. Retrieved from <https://bit.ly/3kQUqkw>.
- Bondoc, B. (2017). How do Filipinos view education? Retrieved from <https://bit.ly/2UDj8GX>.
- Borghans, L., Golsteyn, B. H., Heckman, J. J., & Humphries, J. E. (2016). What grades and achievement tests measure. *Proceedings of the National Academy of Sciences*, 113(47), 13354-13359. doi:10.1073/pnas.1601135113.
- Brown, A., & Rich, M. (2020). Pedagogy and evaluation: The challenge for business and management degree courses in the 21st century. *Electronic Journal of Business Research Methods*, 18(2). <https://doi.org/10.34190/jbrm.18.2.002>.
- Calin, G. (2015). Business education in the present society: Problems, challenges, and solutions. Retrieved from <https://bit.ly/3nB2pjU>.
- Capareda, F. (2012). Structure of intelligence. Retrieved from <https://bit.ly/3nheL13>.
- Chakma, D. (2021). Importance and characteristics of achievement test. Retrieved on July 24, 2021 from <https://bit.ly/3BBilKR>
- Chandra, R. (2013). Influence of intelligence and gender on academic achievement of secondary school students of lucknow city. *IOSR Journal of Humanities and Social Science*, 17(5), 09-14. doi:10.9790/0837-1750914.
- CHED Memorandum Order No. 17. (2017). Revised policies, standards, and guidelines for bachelor of science business administration (BSBA). Retrieved from <https://goo.gl/rJtRkm>.
- CHED Memorandum Order No. 46. (2012). Policy-standard to enhance quality assurance (QA) in Philippine higher education through an outcomes-based and typology-based QA. Retrieved from <https://goo.gl/fu8ssA>.
- Chen, J., Moran, S., & Gardner, H. (2009). Multiple intelligence around the world. Hoboken, New Jersey: John Wiley & Sons.

- Cherry, K. (2019). Gardner's theory of multiple intelligences. Retrieved from <https://bit.ly/379SOKp>.
- Cherry, K. (2020). How achievement tests measure what people have learned? Retrieved from <https://bit.ly/3riPw0o>.
- Chiang, I-C. A., Jhangiani, R. S., & Price, P.c. (n.d.). Correlational research. Research Methods in Psychology (2nd. ed.). Victoria, B. C. : BC Campus. Retrieved from <https://bit.ly/38hJRzs>
- Commission on Higher Education [CHED]. (2017). Higher education enrollment by discipline group: AY 2018-19. Retrieved from <https://bit.ly/2UEedoW>.
- Commission on Higher Education. (2020). 2020 higher education facts and figures. Retrieved from <https://bit.ly/2UFRzgl>.
- Cornerstone University. (2018). What are multiple intelligences and how do they affect learning? Retrieved from <https://bit.ly/3q5fMLj>.
- Culatta, R. (2020). Triarchic theory. Retrieved from <https://bit.ly/3o45Pfp>.
- Dandagal, S., & Yarriswami, M. (2017). A study of intelligence in relation to academic achievement of secondary school students. Retrieved from <https://bit.ly/3lKh4sF>.
- Dulay, D. (2019). Is a college degree really worth it? Retrieved from <https://bit.ly/2KbQUkr> on November 19, 2020.
- E-Learners. (2020). What is business administration? Retrieved from <https://bit.ly/2KjAerr>.
- Heckman, J. J., Humphries, J. E., & Kautz, T. (2015). The myth of achievement tests: The GED and the role of character in American life. Chicago: The University of Chicago Press.
- Howard, B., McGee, S., Shin, N., & Shia, R. (2001). The triarchic theory of intelligence and computer-based inquiry learning. Educational Technology Research and development 49, 49-61. <https://doi.org/10.1007/BF02504947>.
- Jorge, C. (2011). Tertiary education challenges. Retrieved from <https://bit.ly/3kJPI4x>.
- Kappe, R., & Van der Flier, H. (2012). Predicting academic success in higher education: What's more important than being smart? European Journal of Psychology of Education, 27(4), 605-619. doi:10.1007/s10212-011-0099-9.
- Kaya, F., Juntune, J., & Stough, L. (2015). Intelligence and its relationship to achievement. İlköğretim Online, 14(3), 1060–1078. <https://doi.org/10.17051/io.2015.25436>.

- Kpolovie, P. J. (2016). Intelligence and academic achievement: A longitudinal survey. *International Journal of Recent Scientific Research* 7(5), 11423-11439. <https://bit.ly/37hGSY3>.
- Mackintosh, N. J. (2011). *IQ and human intelligence* Oxford: Oxford University Press.
- Madhav University. (2018). Guilford's structure of intellect (SI) theory. Retrieved on December 10, 2020 from <https://bit.ly/3n2MIYg>.
- Marens, M. (2020). Gardner's theory of multiple intelligences. Retrieved from <https://bit.ly/2VdW3ut>.
- McKenzie, W. (2005). *Multiple intelligences and instructional technology* (2nd ed.). Washington DC, USA: International Society for Technology in Education.
- Nucum, K. (2018). Ten business schools in the Philippines you should consider . Retrieved on November 18, 2020 from <https://bit.ly/3pDf4og>.
- Ochieng, K. (2015). *A relationship between intelligence and learning?* Munich, Grin Verlag. Retrieved from <https://bit.ly/3f8YpUN>.
- Pappas, C. (2020). Everything e-learning pros need to know about the structure of intellect. Retrieved from <https://bit.ly/3qIgjD3>.
- Plant, E. A., Ericsson, K. A., Hill, L., & Asberg, K. (2005). Why study time does not predict grade point average across college students: Implications of deliberate practice for academic performance. *Contemporary Educational Psychology*, 30(1), 96-116. doi:10.1016/j.cedpsych.2004.06.001.
- Potter, K. (2020). What is a GPA and why is it so important? Retrieved from <https://bit.ly/3rfvJ1T>.
- Purdue University Global. (2020). Three reasons why you should study business administration. Retrieved from <https://bit.ly/2ITtlfv>.
- Reyes, J. (2016). Triarchic theory of intelligence. Retrieved from <https://bit.ly/368Cb2o>.
- Roth, B., Becker, N., Romeyke, S., Schäfer, S., Domnick, F., & Spinath, F. M. (2015). Intelligence and school grades: A meta-analysis. *Intelligence*, 53, 118-137. doi:10.1016/j.intell.2015.09.002.
- Stecker, P. M., & Fuchs, L. S. (2010). Effecting superior achievement using curriculum-based measurement: The importance of individual progress monitoring. *Learning Disabilities Research and Practice*, 15(3), 128-134. doi:10.1207/sldrp1503_2.
- Steele, H. (2020). Ten things every business student should know. Retrieved from <https://bit.ly/2UCfn4t>.

- Stevens, A. (2016). What is IQ- and how much does it matter? Retrieved from <https://bit.ly/34yPA2t>.
- Suarez, M., Chan C., & Obieta J. (2018) Higher education systems and institutions, Philippines. In: Teixeira P., Shin J. (eds) Encyclopedia of international higher education systems and institutions. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-9553-1_507-1.
- Surhone, L., Timpledon, M., & Marseken, S. (2010). Triarchic theory of intelligence: Intelligence, Robert Sternberg, cognitive science, problem solving, decision making, adaptation, educational psychology. Mauritius: Betascript Publishing.
- Thayamathy, P., Elango, P., & Karunarathna, K. (2018). Factors affecting academic performances of undergraduates: A case study with third year science undergraduate of eastern university, Sri Lanka. *Journal of Education, Society and Behavioural Science*, 25(3), 1-10. doi:10.9734/jesbs/2018/41697.
- The College Monk. (2021). What is gpa and why it is important? Retrieved from <https://bit.ly/3BwSALP>.
- The World University Rankings. (2015). Exam problems. Retrieved from <https://bit.ly/3kIWfwf>.
- Vinney, C. (2020). Understanding the triarchic theory of intelligence. Retrieved from <https://bit.ly/3ljUMNr>.
- Watson, A. K., & Monroe, E. E. (2009). Academic achievement: A study of relationships of IQ, communication apprehension, and teacher perception. *Communication Reports*, 3(1), 28-36. doi:10.1080/08934219009367498.