

De La Salle Santiago Zobel School

Senior High School

Science, Technology, Engineering and Mathematics Strand

**Differences in Business Planning Proficiency in the field of Entrepreneurship  
between ABM and STEM Strand**

Submitted to

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# **CHAPTER 1**

## **BACKGROUND OF THE STUDY**

### **I. Introduction**

The Philippine landscape of education has experienced drastic changes throughout the years, from before the times of being colonized, to the inception of the public school in 1909. The country has been experiencing challenges in this aspect from finding the right curriculum, teachers, facilities, and so on and so forth. Policies from thereon have been continuously added and refined, examples being the 1991 of Congressional Commission on Education (EDCOM) for the restructuring of education in the Philippines, headed by former Senator Edgardo Angara and Congressman Carlos Padilla. Until now, there are many reforms being done to the education landscape, even more recently the drastic shift to the K-12 curriculum a few years ago, known as the Basic Education Act of 2013 (Republic Act 10533) signed into law by President Aquino. (Mital et al., 2014).

The K-12 curriculum adds on three years of formal schooling in basic education level in contrast to the 10-year basic education curriculum, with the intent of having the Philippines become globally competitive in other countries (Cabansag, 2014). According to Hom from 2014, the implementation of the K-12 program would provide students a chance to excel in their own respective assigned programs in accordance to the distinction they would fall under or choose, mainly being STEM, ABM, and HUMSS.

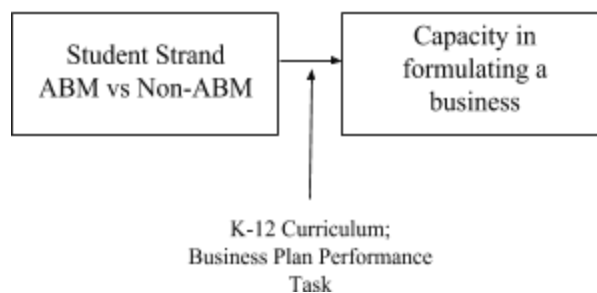
In time with the implementation of the K-12 curriculum is the study and finding of a need for more entrepreneurs in the Philippines, considering that more than half of the Philippines' jobless sector comprises the youth, thus needing more opportunities in employability through entrepreneurship (Gozun & Rivera, n.d.). This relates itself to one of the strands mentioned beforehand, ABM, which is short for Accountancy and Business Management. The strand expects its students must have interest on related career paths or course choices such as human relations management, personal service, business, management, sales, family activity and so on and so forth, (Magno & Piosang, 2016) relating to the strand as well as entrepreneurial activity in the Philippines as an example. It is given that individuals with exposure to entrepreneurship such as starting a business as a form of career is encouraged by external factors, thus saying that those with a greater awareness about it as a career choice in turn hone abilities in performing entrepreneurial behavior. (Liñan, 2004).

Although educational institutions are recommended to pay close attention to the wanted occupations of the students, beyond the direct purpose of providing education, educational institutions aim to prepare the youth for their future colleges and probable career paths. According to Lagajino, Ibanez, Guiruz, Tuting and Balila (2016) of Adventist University of the Philippines, education is universally recognized as the answer to any socio-economic related problems of the world. Education aims to provide solutions for poverty, joblessness, ignorance, to name a few. In their study as well was

revealed the specific academic tracks, showing that around 8% of their respondents intend to delve into business as a main career.

It is imperative to begin quantifying this as early as the beginning year of senior high school, to be able to gauge the entrepreneurial activity and competencies of ABM students in preparation for careers relating to entrepreneurial activity as a reflection of future application. It is of interest to find not only ABM and its competencies based on the eleventh grade, but also to find how the strand fares in comparison to other strands such as the STEM strand, as a means to see if the K-12 curriculum that divides the concentrations of education is effective in honing the ABM related skillset, or if entrepreneurial proficiencies could be observed elsewhere than the strand it is expected from, which would be beneficial especially in the problem of youth unemployment in the Philippines.

## II. Conceptual Framework



*Figure 1.1 The relation among entrepreneurial knowledge, existence of such in ABM vs. Non-ABM Strand and the capacity in formulating a business*

This conceptual framework is on the basis of related literature, that provides the connection between the variables. The main aspect of the research paper aims to find the difference in proficiencies between ABM and STEM in business planning, quantifiably through the use of their business plan performance task as a gauge for the strand's capabilities and possible performance in the entrepreneurial field in the future, especially for those who intend to pursue related careers. The business plan is used as a measure as it exhibits the most relevant aspect of entrepreneurial ability in the face of youth unemployment, as more businesses lead to more areas for employment. The business plan as well is a good variable as it uses the same rubric for grading for both strands, lessening possible discrepancies in the future.

To reiterate briefly, the amount of entrepreneurial behavior according to Raposo and Paco (2011) is directly related to an individual's capacity in formulating a business, while Alsos and Kolvereid (1998) connect prior entrepreneurial knowledge to its presence in education itself. The bridge between the students' experiences and their capacity in formulating a business is most evident in the current educational system, K-12 curriculum, which provides a strand, ABM, which has entrepreneurship as one of its main focuses in accordance to its content in Accounting and Business Management.

### **III. Statement of the Problem**

For this comparative quantitative research, the researchers would like to answer these following questions:

1. What is the numerical relationship between the academic strand and their business planning proficiency?
2. Which among the strands have a higher proficiency in business planning?

### **IV. Significance of the Study**

As stated beforehand, the study is significant as it aims to find the capacity in formulating a business in preparation for future careers in or in relation to entrepreneurship, which serves to resolve or alleviate the problem of youth unemployment. This study takes previous studies a step forward as it quantifies the competencies and readiness of students, especially those who already have entrepreneurship or a related course in mind such as the ABM students of the current K-12 curriculum, an aspect which is rarely in related studies. To thereon reiterate:

*Education.* The study is significant to the educational landscape of the Philippines as it serves to quantify and analyze the effectiveness of the K-12 Curriculum in the field of ABM. Given that entrepreneurial knowledge and competency is expected to be refined and tested through applications in the strand as in comparison to other strands, it is a given that the strand should then have a higher competency or

proficiency in the field of its focus. It is also of interest to remember that the K-12 curriculum was adopted in the Philippines to make the country more competitive on the global scale, and is thus important to gauge the effectiveness of the curriculum in regard to its future application.

*Career and employment.* As previously reiterated, the Philippines currently has a problem in youth unemployment, as it implores the younger and emerging generations to consider pursuing entrepreneurial behavior through business. As it has been stated that the exposure to entrepreneurial behavior is directly related to the willingness or interest in venturing into entrepreneurship in the future, it is a study that is beneficial in these studies as it puts to test the exposure of students to entrepreneurial knowledge, and how it is related to their business formulating capacity which could be a simulation of future endeavors of their field.

## **V. Scope and Delimitations**

The population of the study will be focused on the Senior High School level of education in De La Salle Santiago Zobel, which limits our research as it only focuses on a private educational institution as a gauge of business planning proficiency through strands. Also, out of the three main strands of the K-12 curriculum, the study is only able to compare the ABM strand to STEM strand, due to HUMSS who have not accomplished the business plan performance task at the time of the study.



Furthermore, the study will focus only on the business plan aspect of Entrepreneurship, which takes away other aspects of ABM education such as accountancy and economics, which could also be substantial in the study. It is of concern that the study only tackles the very question of which strand has a higher proficiency in business planning proficiency, which would be needing more substance in terms of providing the research a reason why this is or is not. However, the latter is to be expounded more likely through qualitative methods, to better understand possible reasons for any difference that could possibly be observed.

## **VI. Definition of Terms**

### **1. Academic Strands of Senior High school**

- a. “Senior High School (SHS) covers the last two years of the K to 12 program and includes Grades 11 and 12. In SHS, students will go through a core curriculum and subjects under a track of their choice.” Under the academic track are the strands STEM (specializes in science, technology, engineering and math), ABM (specializes in accounting and business management) and HUMSS (specializes in humanities and social sciences). With the specialization of subjects, this may allow students to develop and strengthen specific skills and competencies based on their chosen strand (DepEd, 2015).

### **2. ABM Strand**

- a. ABM is the abbreviation of Accountancy and Business Management strand. One of the academic strands provided by the K-12 curriculum. In comparison to other strands, it contains the sample scheduling of subjects of Applied Economics, Business Ethics and Social Responsibility, Fundamentals of Accountancy, Business and Management, Business Math, and so on and so forth as according to DepEd.
3. STEM Strand
- a. STEM is an education program whose curriculum is pillared by four main disciplines mainly; Science, Technology, Engineering and Mathematics. Upon venturing through the programs, students undertaking the course would be able to learn the different pure and applied forms of these topics itself. Instead of teaching these core curriculums separately and distinctly, STEM is a program allowing to integrate them into a cohesive learning paradigm to allow students to be able to apply such topics interdependently (Hom 2014). This program would have to require a basic skill set such as mathematical literacy and logical understanding by STEM workers to have a better understanding of different concepts covered by n Science, Engineering, and Technology (Batterham & Miles, 2000)
4. Student Capacity (based on our research title)
- a. Operational definition would be in use of quantifying scores in entrepreneurship geared activities and outputs among the strands that all experienced. Focuses on the Business Plan project experience in 2016,

which serves as a simulation of formulating one's own business plan in the real world as a reflection of entrepreneurial student capacity as the most relevant application for the future.

## **CHAPTER 2**

### **REVIEW OF RELATED LITERATURE**

#### **I. Introduction**

This review of related literature will first highlight the key role enacted by a student education inclusive of an entrepreneurship curriculum to either confirm or disconfirm it being a key role in providing such entrepreneurial competencies and conventional wisdom needed by students taking secondary education, and if entrepreneurial education serves the purpose of providing the essential skills necessary to start a business. It will then also explain the necessity of an entrepreneurial education on a national platform as a proof of necessity or importance for this research to be carried out. In summary, we will be conducting a survey to whether the students chosen strand of choice will greatly affect their future skillset which may or may not be useful in terms of creating a business and or helping them become a successful entrepreneur, to serve not only as a basis for educational quality or difference between strand focus as well as a projection into the youth in the field of entrepreneurship in the future as a need.

We have found that despite studies surrounding the state of the Philippines and entrepreneurship as well as the K-12 curriculum, there seems to be a severe lack thereof of the study or quantifying of numerical performance in the effectiveness of the K-12 curriculum in the various student strands, particularly ABM, in their proficiency in the field of Entrepreneurship. As K-12 is relatively recent in its implementation, there

has yet to be a good scope of literature review to turn to, especially those that fall under quantitative research, and thus all the more the scope we seek in our study of ABM business planning student proficiency in Entrepreneurship in comparison to STEM. Most studies claim that K-12 hones skills especially of the strand's nature, but does not exactly provide statistical evidence nor experiments to such.

## **II. Body**

### *K-12 Curriculum in the Philippines*

In 2015, the Department of Education (DepEd) in the Philippines implemented the Senior High School program, as part of the new K-12 curriculum which is also known as the Basic Education Act of 2013 (Republic Act 10533), that was signed into law by President Aquino. According to DepEd (2015), "Senior High School (SHS) covers the last two years of the K to 12 program and includes Grades 11 and 12. In SHS, students will go through a core curriculum and subjects under a track of their choice." Under the academic track are the strands STEM (specializes in science, technology, engineering and math), ABM (specializes in accounting and business management) and HUMSS (specializes in humanities and social sciences). With the specialization of subjects, this may allow students to develop and strengthen specific skills and competencies based on their chosen strand (DepEd, 2015). A review of related literature on the basic education (K-12) curriculum specifically the senior high school (SHS) of the Philippines, Japan, and the US by Sarmiento Danilo of Buenavista National High School and Ronald Orale of Samar State University back in 2016, the

SHS curriculum as a whole intends to prepare students to enter into university or to work in the industry or be an entrepreneur. In comparison to other countries, the Philippines has a clearer model of at least four tracks (Academic, Tech-Voc, Sports, Arts & Design) and at least ten strands, in comparison to Japan with two tracks in academics and Tech-Voc, and the US whose education system varies from state to state with no definite track due to such.

### *ABM Strand*

The ABM strand is another one of the common key programs found in the K-12 curriculum established. The primary objective of the course mainly aims to prepare students taking the secondary level of education to practice the different professions covered by the course mainly accounting, entrepreneurship and to perform other various related business functions. Essentially it is important to remember that these subjects have different content and competencies which would have to be reviewed by the students applying for the program to determine the suitable course for him/her (Cruz, 2014). According to Carlo Magno and Tristan Piosang (2016) of National University, ABM students upon entering the track, must exemplify English and mathematical skills and be inclined in interest on human relations management, personal service, business, management, sales, family activity, finance and office work if not related to such for the related university courses and future related career path.

### *STEM Strand*

STEM is an education program whose curriculum is pillared by four main disciplines mainly; Science, Technology, Engineering and Mathematics (Tsupros, 2009). Upon venturing through the programs, students undertaking the course would be able to learn the different pure and applied forms of these topics itself. Instead of teaching these core curriculums separately and distinctly, STEM is a program allowing to integrate them into a cohesive learning paradigm to allow students to be able to apply such topics interdependently (Hom 2014). The program focuses on various subjects and turns it them into a more rigorous and challenging learning experience upon student's exploration. What differs the program from the conventional way of learning math and science is the multiple activities in stored for students to be able to use insights in real-world applications. This program would have to require a basic skill set such as mathematical literacy and logical understanding by STEM workers to have a better understanding of different concepts covered by Science, Engineering, and Technology (Batterham & Miles, 2000).

#### *Advantages of having innate skill in choosing a career path*

There are many advantages in the utilization of fundamental skills which for one instance gives the said person a more comfortable work ethic and thus making it easier for the person to be more committed to the workload. The advantage of being able to follow a career of your interest or one that one may have a natural skillset in as stated by Newport (2012) that with an in-depth understanding of what the career entails and

the knowledge that your life's work will ultimately be fulfilling, adds to your motivation to remain committed, even when the rewards seem distant.

In terms of entrepreneurship and the ability of managing a business, according to Morris' conceptual framework, entrepreneurial talent is something given or innate. Likewise, Scott Shane's experiment, as mentioned in Matthews (2011), show that entrepreneurial success may be caused more by "nature" as compared to "nurture". Although with that mentioned, several researchers claim the opposite, stating that entrepreneurship and its skills can be taught and developed through entrepreneurship education (Drucker, 1985, Holland, 2010, Rasheed, 2003). With proper entrepreneurial education, the students may have an increased knowledge in business and presence of entrepreneurial characteristics (Krueger and Brazeal, 1994).

### *Entrepreneurial education*

Entrepreneurial activity as described by Ahmad and Hoffman (2007) is the enterprising of human action in pursuit of the generation of value through the expansion of economic activity by the exploiting of new products, processes or markets. Entrepreneurs are defined then as one who establishes the business as owners, or does so in a more involved and immersive manner, preceding such, individuals who accumulated different experiences and prior knowledge in the field of entrepreneurship are commonly referred as those who have the intent of coursing down the path of the entrepreneurial process and having it be a vital part their lives specifically in career



choices (Liñán 2004; Venkataraman 1997). This factor is commonly referred to as Prior Entrepreneurial Exposure (Reynolds 1997). Prior research states that individuals with prior exposure significantly differ from individual without such described exposure in terms of the intent in taking of the entrepreneurial process (Alsos and Kolvereid 1998; Westhead et al. 2005). As defined by the Prior Entrepreneurial Exposure and its types, the intention and will to get involved with the fields of entrepreneurships such as starting a business as a form of a career is not reached in isolation; meaning it does not come out of nowhere but is rather encouraged by external factors being various circumstances and influences within the process itself. Therefore, individuals with such exposure may have a greater awareness about entrepreneurship as a career choice, increased business knowledge, as well as better abilities to perform and display entrepreneurial behavior and skills (Krueger and Brazeal, 1994, Liñán 2004, Rasheed, 2003).

According to Rauh-Bieri (2016), over the years many Filipinos had positive views about the prospect and idea of considering becoming entrepreneurs as a career choice mainly because they believe they have the right amount capabilities and opportunities present to actually develop. However these capabilities have remained to be untapped and undeveloped up to this day due to the lack of proper education on the matter itself, as the country faces the challenge of promoting entrepreneurship to develop capability and skills of Filipinos in starting and growing businesses. Although with that stated, the

nature of this situation may improve soon especially with the implementation of the Senior High School program.

*Figure 2.1: Rate of basic school entrepreneurial education and training among the Asian countries*

Economy ↕	Year ↕	Basic school entrepreneurial education and training ^
China	2015	1.64
India	2015	2.47
Indonesia	2015	2.67
Iran	2015	1.68
Israel	2015	1.83
Japan	2015	1.48
Kazakhstan	2015	2.23
Lebanon	2015	2.58
Malaysia	2015	2.49
Philippines	2015	3.02
South Korea	2015	1.71
Taiwan	2015	1.89
Thailand	2015	2.18
Turkey	2015	1.46
Vietnam	2015	1.57

Retrieved from Global Entrepreneurship Monitor

(<http://gemconsortium.org/data/key-nes>)

Comparing to the other Asian countries in 2015, the Philippines had the highest rate of small and medium enterprises/entrepreneurs (SMEs) that have taken up basic school entrepreneurial education, which may continue to grow with further development in the curriculum. This supports the claim that many youthful Filipinos have already been enthused to give entrepreneurship a chance to be ventured upon. Lacking practice

at entrepreneurial competencies, basic skills, problem-solving, or imagination, too many fledgling entrepreneurs watch their enterprises either fail or slowly decline. Brian Gozun and John Rivera (n.d.) state that considering that more than half of the Philippines' jobless sector comprises the youth, there is a need in facilitating not only employability but also entrepreneurship among the Filipino youth.

The need of expanding the Philippines in the field of entrepreneurship beyond the aforementioned need of alleviating youth unemployment is evident in the need for social entrepreneurial endeavors, which as said by Dr. Habaradas and Mr. Aure of De La Salle University (2014), fills a void that traditional businesses, governments and non-profit government organizations can provide. The growing interest is perceived to be important as "social enterprises addresses weaknesses in the operation of both markets and government.", a prominent example seen today is Gawad Kalinga (GK) which allows the participation of not only social entrepreneurs but also the youth sector in formulating innovative productive ideas for the community, utilizing their existing entrepreneurial skillsets and competencies for the good of society, especially for the the sectors in need.

### **III. Synthesis**

Most, if not all, related literature on K-12 curriculum claim that students become proficient and capable in the competencies of the strand of their choosing without statistical or experimental evidence, basing this claim solely on the difference in focus in

competencies between the strands. Although this provides a good framework in the different competencies we expect the strands to differ in proficiency of, it neither proves nor disproves what could be the outcome of our study, which aims to see if supposedly higher proficiency ABM in the field of Entrepreneurship really fares better in comparison to STEM. All related literature relating to entrepreneurial education and the pursuing of entrepreneurial competencies through enterprises in the future state a positive outlook towards the engaging of the youth in the field of entrepreneurship, either to alleviate the problem of youth unemployment, but also to be able to fill in the gap that other organizations cannot fill through entrepreneurial competencies that are social in nature, which is finding innovative alternatives to current day problems.

From not only research on related studies on ABM education and SHS in the Philippines but also researching on the future prospects following such, it has been found that the study of ABM education not only lies on the purpose of finding the effectiveness of ABM education to the students' future career paths, but also for the future the Philippines and its need to propagate and support entrepreneurial paths in accordance to the unemployed youth situation currently experienced. Thus, it is imperative to contribute to the study via the quantifying and analyzing of entrepreneurial competencies through ABM requirements in comparison to other strands, in order to see if the strengths of entrepreneurial competencies lie strongly on the related strand or otherwise for preparation into the entrepreneurial path in the future.

This is to either conclude that a senior high school student can be highly proficient in competencies unexpected of their strand and pursue entrepreneurial paths as competently as ABM, or that the K-12 curriculum serves its purpose of reinforcing the competencies expectant of a strand, allowing those who pursue ABM to have a distinctly higher proficiency than those who pursue other strands like STEM. It will be of use to researchers as well as educational institutions in the case that they would rather have balanced strands in the field of Entrepreneurship, or would like to find out if they should place more importance and reinforcement into the difference in strand competencies expectant of them.

### **CHAPTER 3**

#### **METHODOLOGY**

In the process of gathering data for the study, it is to be noted the nature of the study which is quantitative. By understanding the research design, which is comparative, could then be able to set the proper number and classification of participants. A quantitative research requires the ability to properly distinguish the research type and design, determine the sample size by formula, collect data then use the appropriate instrument for data analysis.

In this case, the sample sizes for the participants is determined by using the Slovin's formula. As the data is presumably readily available, it will be retrieved upon

request of the teacher, before it is to be analyzed with the appropriate data analysis method, which is the Mann-Whitney U test to be able to quantify the differences as well as present it appropriately.

## **I. Research design**

This study utilized the Comparative research design, as the main purpose for this research was to compare the students' level of proficiency in the subject of Entrepreneurship, with regards to their strand placement. In this case, it was limited only to the ABM and STEM strands.

According to Laerd dissertation, comparative research may be described as appropriate in the case of examining the differences between two or more groups. Comparative research have groups reflecting categories of independent variables to measure - in this case, ABM and STEM - by which we aim to find the difference in a single measure, which is the business plan grades in the subject of Entrepreneurship.

In the case of the research, variables namely the respondents situated amongst varying distinct academic strands would have to predetermine each student's ability to comprehend and excel upon undergoing the entrepreneurship curriculum. Data would have to be collected through resources found on the sample sizes' performance in terms of grades from their business plan performance task, namely from the Entrepreneurship teacher who handled both strands. Through the comparing of such

variables, as will be able to find differences; Distinct academic strand placement and business planning proficiency with entrepreneurship course are closely related.

## **II. Setting and Participants**

For this study, the researchers utilized the STEM and ABM students of batch 2018 from De La Salle Santiago Zobel school. Although in total, there were 276 students (159 in STEM and 117 students in ABM), only those students who were under a same specific teacher for the subject of Entrepreneurship were observed. It was essential to apply that the teacher variable would remain constant in order to avoid extraneous unrelated relations and limit possible discrepancies with the gathered data. Given the such condition, the initial population was reduced to 197 students, with 80 from STEM and 117 still remained from ABM.

The Slovin's formula was then utilized In order to get the appropriate sample size for this study. Given the population of 197 students from both ABM and STEM strands and a margin of error of 5%, the calculated sample size was 132 respondents. The students, with this formula, will be chosen via stratified random sampling to omit other possible variables.

Slovin's formula:  $n = \frac{N}{1+Ne^2}$

Where n= sample size, N= population and e= margin of error

$$n = \frac{N}{1+Ne^2} = \frac{197}{1+(197)(.05)^2} = 132$$

*Figure 3.1: Determining the sample size using Slovin's formula*

The sample size was then divided by the population in order to get the percentage of students required for the study. This percentage was then multiplied to each of the class' population in order to get the number of respondents specifically needed for each of these classes.

	Class population	Sampling percentage ( $\frac{n}{N} \times 100$ )	Number of respondents taken per class
Section A (STEM)	41	67%	27.47 = 28
Section B (STEM)	39	67%	26.13 = 26
Section E (ABM)	38	67%	25.46 = 26



Section F (ABM)	41	67%	$27.47 = 28$
Section G (ABM)	38	67%	$25.46 = 26$
TOTAL	N = 197		134 (additional 2 respondents from the calculated 132 sample size)

*Figure 3.2: Number of respondents taken per class*

### III. Data Collection Procedure

- I. The method of data collection would mainly be reliant on the method of compiling readily available documents. The document method is pertaining to the records of the numerical grades of the students of ABM and STEM students for the academic year 2016 - 2017, which could be collected through the teacher. As the data is readily available, is it then unnecessary to have an instrument for the data collection of such, thus only needing an accurate means of data analysis for the study.
- II. The data of the grades of the business plan performance task of the student respondents in the subject of Entrepreneurship from the sample would serve as

the references and resource material essential to the collection of data process required by the research. Therefore, these pieces of information would also need to be looked into upon provision of the educator in charge as well as the consent of the students involved. Data collected would be necessary in determining the comparison between the educational exposure of student due to stand placement and the ability to excel with entrepreneurship itself.

- III. After thorough data collection and overall statistical analysis, the received information would have to be further evaluated and interpreted through the appropriate statistical treatment. The data acquired through these methodological strategies will be further elaborated in Chapter 4, which includes data analysis, utilizing the Mann-Whitney U test as well as One-Way ANOVA as the source of the statistical treatment. Furthermore, the obtained data from the procedure will be interpreted to further clarify the ability of a student to excel with entrepreneurship and the differences in regard to the strand.

#### **IV. Statistical Treatment**

In order to properly plot and analyze the gathered results effectively, it is vital in the research to determine the statistical treatments and formulas needed to perform such analysis, including how to represent the data.

As mentioned previously, the Slovin's formula was utilized in order to determine the appropriate sample size needed for this research, given the population and

sampling error. Having the right sampling size is essential to a research, as it determines the credibility and reliability of the study.. Using the Slovin's formula will allow a secured number of respondents, while still having a balance between the study's credibility and the efficiency of time spent by the researchers in conducting the needed tests.

$$n = \frac{N}{1 + Ne^2}$$

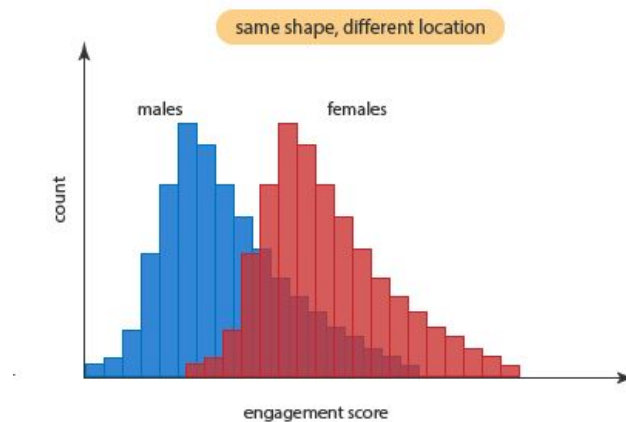
*Figure 3.3: Slovin's formula*

In terms of data organization and analysis, as the study's core method of analyzing data would be through determining the mean rank of the numerical scores in assessments and performance tasks between the two strands, the most appropriate statistical treatment to be utilized would be the Mann-Whitney test. According to Statistics Solutions (2017), "The Mann-Whitney U test is the non-parametric alternative test to the independent sample t-test. It is a non-parametric test that is used to compare two sample means that come from the same population, and used to test whether two sample means are equal or not.". It is appropriate as it is found that the research that likened to our research design the most, as the test contains the assumptions that:

1. The sample drawn from the population is random

2. Independence within the samples and mutual independence is assumed  
(an observation is only in one group and not both)
3. Ordinal measurement scale is assumed

Below is a sample representation data for the Mann-Whitney test between two independent groups as taken from Laerd statistics (n.d.), which is similar in nature to the data at hand once the data analysis itself is complete, to serve as a reference or conceptual representation.



*Figure 3.5: Mann-Whitney U Test representation of data*

$$\bar{X} = \frac{\sum X}{N}$$

x= Numerical values

N= Total number of collected data values

*Figure 3.4: Mean formula*

In the reporting of the Mann-Whitney U-test, a measure of central tendencies between the two groups is essential. Considering that the Mann-Whitney U test is ordinal, the most appropriate to report would be the median, as it is recommended for describing the data. According to Leard statistics, the test can determine if the values in one group are lower or higher than the values in the other group via the mean ranks of each distribution of scores. This is by the ranking of each score of the dependent variable - in our case, their scores or grades - in respect to the groups, then averaged to be able to determine the distributions, if they are identical or if there is a large difference. A similar or identical distribution would mean a null hypothesis, unless a group has a higher or lower mean than the other.

## CHAPTER 4

### DATA ANALYSIS AND INTERPRETATION

In this chapter of the paper, the results of the procedure as well as data analysis are to be presented in tabular form as well as interpreted, with the intention of answering the research questions stated previously. The analysis of data was done through the use of SPSS, and two statistical treatments were used in order to answer the research questions. These two treatments are namely One-Way Anova, and Mann-Whitney U Test. The One-Way Anova as a statistical treatment is determined to find any statistically significant differences between the means of two or more unrelated independent groups, while the Mann-Whitney U test is used to compare the differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. The results and analysis using such are as follows.

Descriptives								
Grade								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
STEM	54	54.20	4.448	.605	52.99	55.42	43	60
ABM	77	49.71	5.188	.591	48.54	50.89	41	59
Total	131	51.56	5.360	.468	50.64	52.49	41	60

*Table 4.1 Descriptives*

Table 4.1 presents differences between the two groups, ABM and STEM. The mean of ABM is presented to be 49.71 while the mean of STEM is presented to be 54.20, which shows a difference of 4.49 in mean between the two groups. We are also

able to see the minimum and maximum values of the proficiency in business plan performance, which already indicates a shift in values horizontally, where STEM is closer to 60, the maximum score, compared to ABM. The difference stated here will then be discerned statistically if there is a significant difference.

Grade

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	639.725	1	639.725	26.668	.000
Within Groups	3094.474	129	23.988		
Total	3734.198	130			

*Table 4.2 ANOVA*

In reference to the data in table 4.2, the data ran by one-way ANOVA ( $F(1,130) = 26.668$ ,  $p = .000$ ), there is a statistically significant difference between ABM and STEM in their business plan performance task, considering that the p-value is less than 0.05. This meaning that one with the higher mean of the two groups has a statistically higher performance in terms of grade than the other. Considering that the f-value is large and the p-value is below 0.05, the results are significant and cannot reject the null hypothesis.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Grade is the same across categories of Strand.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

*Table 4.3 Hypothesis Test Summary Using Mann-Whitney U Test*

According to the design of the Mann Whitney U test , values greater than 0.05 indicate similarity between the numerical data, whereas oppositely, values less than 0.05 indicate more variation between the data, thus having more significantly different results between the 2 groups.

With this study having a significance value of .000, this confirms, along with the ANOVA statistical treatment, a significant difference between the distribution of grades between the ABM and STEM strands.



## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATIONS**

This chapter concludes the report of the entire research process. A summary of the research is presented, and different acquired findings and data of the study are to be discussed and interpreted in detail based from the research questions and the interpreted data as pieces of information supported by. The overriding significance of this research study is to examine whether there would be any significant difference in proficiency in the subject Entrepreneurship, specifically the aspect of business planning aptitude. Recommendations and limitations will be discussed for further research purposes by the end of the chapter.

The scope of the following conclusions is limited to the information obtained from various pieces of related literature and the context obtained from the gathered upon interpretation. Thus, applied to other situations, these conclusions may yield incorrect assumptions. Still, these conclusions are relevant based on the stated problem above.

The K-12 curriculum in introducing the ABM strand is timely in relevance to the increase of youth unemployment. There is an imperative need to gauge the capabilities of senior high students, especially those who are most likely to pursue an entrepreneurial path, which are students from the ABM strand, as they may project such proficiency in the future and alleviate the problem of youth unemployment by allowing more areas for employment through business and entrepreneurship. By obtaining their

performance and proficiency in the business plan task, we were able to statistically approach such finding numerically in terms of proficiency.

Reiterated in the data analysis portion of the previous chapter, one-way ANOVA ( $f(1,130) = 26.668$ ,  $p = .000$ ) shows us that there is a statistically significant difference between ABM and STEM in their business plan performance task, one being higher than the other. There is a notable numerical relationship between the academic strand and their business planning proficiency due to this.

In concern to mean score, STEM has a higher mean of 54.20 while ABM has a mean of 49.71. On the aspect of numerical content, the minimum and maximum grade of STEM is (43, 60) while ABM is (41, 59), showing a higher range for STEM. Thus, in terms of business planning proficiency, STEM has a higher proficiency compared to ABM.

The results are a large contributor in the field of research in education, especially in the field of educational research in the Philippines. This provides a stepping stone in the study of proficiencies in relevant occupations today to students who may possibly pursue such occupations in the future and in this case in particular, current ABM students as possible future entrepreneurs. This could help educational institutions reinforce proficiencies and competencies suiting to the future occupation if the strand is not as highly proficient as the institution hopes for it to be. However, considering that

this research paper tackles something that has not been concretely done before both in education in general as well as in the Philippines, there are several recommendations that could be imparted for the delving into of this research as a structure as well as its intention.

Recommendations of such firstly is to be able to perform this study on the third strand, which is HUMSS for comparison purposes in proficiency. However, it is to be noted that this was not possible in due to circumstance of them not accomplishing it at the time of the research. Secondly, it would greatly benefit the research to expound further in relation to the research, through finding and asking more relevant questions and data, such as how many intend to pursue an entrepreneurship related course or career, as interest and relevance could serve as a factor in the student's performance. Lastly, delving deeper into possible factors that could validate the results or give an explanation to such is important, such as previously stated student interest, student engagement, background on proficiency outside of school, then approaching this aspect by finding the statistical analysis and correlation of such.

## References:

1. Abulencia, A. (2015). The unraveling of K-12 program as an education reform in the Philippines. South-East Asian Journal for Youth, Sports & Health Education, 1(2), pp.229-240. Retrieved from [https://www.researchgate.net/publication/283084339\\_The\\_Unraveling\\_of\\_K-12\\_Program\\_as\\_an\\_Education\\_Reform\\_in\\_the\\_Philippines](https://www.researchgate.net/publication/283084339_The_Unraveling_of_K-12_Program_as_an_Education_Reform_in_the_Philippines)
2. Ahmad, M. & Hoffman, A. (2007). A framework for addressing and measuring entrepreneurship. Retrieved from <http://search.oecd.org/std/business-stats/39629644.pdf>
3. Alsos, G. A. & Kolvereid, L. (1998). "The business gestation process of novice, serial, and parallel business founders." Entrepreneurship: Theory and Practice, Summer 1998, p. 101. Academic OneFile
4. Batterham, R., & Miles, D. (2000). Australia's innovation future. Retrieved 24 February, 2002, from <http://www.dest.gov.au/science/pmseic/documents/mtg6Item2AAustInnovfuture.doc/>
5. Cabansag, M.S. (2014). Impact statements on the k-12 science program in the enhanced basic education curriculum in provincial schools. International Refereed Research Journal, 5(2) pp 29-39. Retrieved from [http://www.researchersworld.com/vol5/issue2/Paper\\_04.pdf](http://www.researchersworld.com/vol5/issue2/Paper_04.pdf)

6. Crawford, M. (2012). *From engineer to entrepreneur*. Retrieved from <https://www.asme.org/career-education/articles/entrepreneurship/from-engineer-to-entrepreneur>
7. Cruz, I. (2014, June 19). The ABM strand. *The Philippine Star*. Retrieved from: <http://www.philstar.com/education-and-home/2014/06/19/1336428/abm-strand>
8. Danilo, S.H & Orale, R.L. Senior High School Curriculum in the Philippines, USA, and Japan. *Journal of academic research* 1 (30), 12-23. Retrieved from: <http://www.ssu.edu.ph/subdomains/ojs/index.php/JAR/article/view/54>
9. Department of Education. (n.d). Senior High School. Retrieved from <http://www.deped.gov.ph/k-to-12/faq/senior-high-school>
10. Department of Education. (n.d). An introductory guide to senior high school. Retrieved from: [http://www.deped.gov.ph/sites/default/files/SHS%20Student%20Primer\\_Colored%20HiRes.pdf](http://www.deped.gov.ph/sites/default/files/SHS%20Student%20Primer_Colored%20HiRes.pdf)
11. Drucker, P.F. (1985). *Innovation and entrepreneurship practice and principles*. New York: Harper & Row
12. GEM National Expert Survey. (n.d). The entrepreneurial ecosystem. Retrieved from: <http://gemconsortium.org/data/key-ne>
13. Gozun, B.C & Rivera, J.R. (n.d). Youth employment and entrepreneurship in the Philippines. Retrieved from [https://www.pep-net.org/sites/pep-net.org/files/CBMS/PEP\\_Mtng/13th/Papers/Rivera\\_Gozun\\_0.pdf](https://www.pep-net.org/sites/pep-net.org/files/CBMS/PEP_Mtng/13th/Papers/Rivera_Gozun_0.pdf)

14. Gravenitz, G., Harhoff, D., & Weber, R., (2009). *Effects of entrepreneurship education*. Retrieved from [https://epub.ub.uni-muenchen.de/10966/3/EEE\\_WvGH\\_LMUe.pdf](https://epub.ub.uni-muenchen.de/10966/3/EEE_WvGH_LMUe.pdf)
15. Habaradas, R.B & Aure, P.H. (2014). Creative and collaborative strategies for social enterprises in the Philippines. *DLSU Business Notes and Briefings* 2(4). Retrieved from: [https://www.researchgate.net/profile/Raymund\\_Habaradas/publication/272509478\\_Creative\\_and\\_collaborative\\_strategies\\_for\\_social\\_enterprises\\_in\\_the\\_Philippines/links/54e81d320cf25ba91c7b00e1/Creative-and-collaborative-strategies-for-social-enterprises-in-the-Philippines.pdf](https://www.researchgate.net/profile/Raymund_Habaradas/publication/272509478_Creative_and_collaborative_strategies_for_social_enterprises_in_the_Philippines/links/54e81d320cf25ba91c7b00e1/Creative-and-collaborative-strategies-for-social-enterprises-in-the-Philippines.pdf)
16. Holland, P. (2010). *My Own Business*. Los Angeles, CA, USA: My Own Business, Inc.
17. Hom, E.J. (2014). *What is STEM education?* Retrieved from <https://www.livescience.com/43296-what-is-stem-education.html>
18. Kohler, R. & Tsupros, N. (2014). *STEM education in southwestern Pennsylvania*. Retrieved from: <https://www.cmu.edu/gelfand/documents/stem-survey-report-cmu-iu1.pdf>
19. Krueger, N.F. & Brazeal, D.V. (1994). *Entrepreneurial potential and potential entrepreneurs*. Retrieved from: <http://cemi.com.au/sites/all/publications/Krueger%20and%20Brazeal%201994.pdf>

20. Liñan, F. (2004). Intention-based models of entrepreneurship education. Retrieved from <https://www.researchgate.net/file.PostFileLoader.html?assetKey=AS%3A273573443244032%401442236399122&id=53dfba2ad11b8b30468b4684>
21. Llewellyn, D., Mital, R., & Moore, P. (2014). Analyzing K-12 education as a complex system. Retrieved from [https://www.researchgate.net/profile/Donna\\_Llewellyn/publication/260914479\\_Analyzing\\_K-12\\_Education\\_as\\_a\\_Complex\\_System/links/53e0c4090cf2d79877a4fcaa/Analyzing-K-12-Education-as-a-Complex-System.pdf?origin=publication\\_list](https://www.researchgate.net/profile/Donna_Llewellyn/publication/260914479_Analyzing_K-12_Education_as_a_Complex_System/links/53e0c4090cf2d79877a4fcaa/Analyzing-K-12-Education-as-a-Complex-System.pdf?origin=publication_list)
22. Magno, C. & Piosang, T. (2016). Assessment Schemes in the Senior High School in the Philippine Basic Education. *Educational Measurement and Evaluation Review* , 7 66-87. Retrieved from [https://www.researchgate.net/profile/Carlo\\_Magno4/publication/308725198\\_Assessment\\_Schemes\\_in\\_the\\_Senior\\_High\\_School\\_in\\_the\\_Philippine\\_Basic\\_Education/links/57ed381108ae7be720544bf9/Assessment-Schemes-in-the-Senior-High-School-in-the-Philippine-Basic-Education.pdf](https://www.researchgate.net/profile/Carlo_Magno4/publication/308725198_Assessment_Schemes_in_the_Senior_High_School_in_the_Philippine_Basic_Education/links/57ed381108ae7be720544bf9/Assessment-Schemes-in-the-Senior-High-School-in-the-Philippine-Basic-Education.pdf)
23. Matthews, R. B., Stowe, C. R. B., & Jenkins, G. K. (2011). Entrepreneurs- Born or made?. *Allied Academies International Conference. Academy of Entrepreneurship* 17(1) 49-55. Retrieved from <https://0-search.proquest.com.lib1000.dlsu.edu.ph/docview/876966279?accountid=28547>

24. Newport, C. (2012). Solving Gen Y's Passion Problem. Retrieved from <https://hbr.org/2012/09/solving-gen-ys-passion-problem>
25. Rasheed, H. S. (2003). Developing Entrepreneurial Characteristics in Youth: The effects of education and enterprise experience. *International Journal of Entrepreneurship education*. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.3346&rep=rep1&type=pdf>
26. Rauh-Bieri, N. (2016). *Developing entrepreneurs: case by case*. Retrieved from: <https://wdi.umich.edu/wp-content/uploads/DEVELOPING-FILIPINO-ENTREPRENEURS-January-3-2017.pdf>
27. Venkataraman, S. (1997). The distinctive domain of entrepreneurship research.
28. Westhead, P. (2005). Novice, serial and portfolio entrepreneur behaviour and contributions. *Small Business Economics* 25(2), 109-132. Retrieved from [http://econpapers.repec.org/article/kapsbusec/v\\_3a25\\_3ay\\_3a2005\\_3ai\\_3a2\\_3ap\\_3a109-132.html](http://econpapers.repec.org/article/kapsbusec/v_3a25_3ay_3a2005_3ai_3a2_3ap_3a109-132.html)