

The influence of school ability measures on accounting competencies: A path analysis

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ABSTRACT

This study aimed to assess the level of school ability measures and accounting competencies of fourth-year BS in Accounting Technology students of UM Digos College. It also investigates which of the two school ability measures, such as verbal and non-verbal, significantly influence accounting competencies. Quantitative correlational research was used, and primary data were gathered using the Accounting Competency Test questionnaire distributed to 32 fourth-year BSAT students for the school year 2015-2016 who had taken the Otis-Lennon School Ability Test at UMDC Guidance and Testing Center. Frequency and relative frequency, mean, statistical correlation, and multivariate regression analysis were used as a statistical method to address the problem in the study. The findings revealed that the fourth-year respondents are overall low in terms of school ability with a below-average verbal ability while average in terms of non-verbal ability. They were also found to be competent enough in accounting. Results also showed that only verbal ability has a significant influence on accounting competencies among the school ability measures. Furthermore, the two dimensions, such as verbal comprehension and reasoning, were significant predictors. On the other hand, non-verbal ability, in terms of figural reasoning and quantitative reasoning, is a non-significant predictor of accounting competencies.

Keywords: school ability measures, path analysis, UMDC, DAE



INTRODUCTION

In the United States of America, after the Sarbanes-Oxley Act of 2002 was signed into law and enacted, accounting degree holders are in higher need in the job industry. President George W. Bush signed the SOX with co-sponsors Paul Sarbanes and Michael G. Oxley from the legislative body. This Act is also called "Public Company Accounting Reform and Investor Protection Act" and the "Corporate and Auditing Accountability and Responsibility Act," in the senate and in the house. The enactment of the response with the issue included those corporations in the U.S such as Enron and Worldcom. The case was about the issuance of fraudulent audited financial statements. The SOX attempts to protect investors since President Franklin Delano Roosevelt's Securities Act following the great depression. Because of those, academes need to produce numerous competent accountants to increase the demand for accounting professionals. According to the American Institute of Certified Public Accountants (2011), as mentioned in the study of Lee et al. (2014) that the public practice of accounting and auditing services or the CPA firms had raised their new hires in the year 2000 to 2010. It fluctuated from 20,951 to 33,321.

In the Philippines, there were substantial flaws in the CPA licensure standards and quality assurance concerning professional arrangements. The accounting education standards and training procedures may also need to be developed (Reid and Barry 2003).

According to the committee on Accounting Terminology of the American Institute of Certified Public Accountants defines accounting as an art of recording, classifying, and summarizing in a significant manner and terms of money, transactions, and events which are in part at least of a financial character and interpreting the result thereof.

To pursue accounting, there are needs of proficiencies such as in English and Mathematics. Based on the previous study of Buba and Umar (2015), the students, who had taken and passed English and Mathematics, have good academic performance in Financial Accounting, and it was found out that there is a significant distinction for being proficient in both subjects mentioned above over to those deficient. This is because English proficiency has something to do with understanding and interpreting financial information, while Mathematics proficiency will execute those understanding into problem-solving.

Furthermore, according to Ballada (2012), intellectual is one of the core competencies of accountants in which this carried out problems that need critical thinking. In this core competency, both English and Mathematics proficiencies are still highly involved, like in the analysis of the transaction, evaluating which applicable principles to be used in problem-solving, and how the problem will be solved based on understanding.

Also, other educational studies have tried to determine the intellectual ability required for students' success in accountancy. Lee et al. (2014) cited that generally, mathematical skills were determined to be the fundamental academic knowledge required for successful accounting students. At the same time, verbal ability is another intellectual measurement highly interrelated with mathematical ability.

However, not all students who desire to pursue accounting are equipped with both Mathematics and English proficiencies. Thus, there is a need to investigate the two proficiencies as separate variables to find out which of the two significantly predicts more and will have a better performance in accounting. Thus, this study aimed to investigate the Verbal and Non-verbal Abilities about Accounting Competencies among the fourth-year BSAT students in UM Digos College.

METHOD

The study was conducted as non-experimental quantitative research in which the data were collected to describe variables, to examine relationships among variable, and to determine cause and effect interactions between variables (Burns and Grove, 2005) following the quantitative correlational research, which aims to systematically investigate and explain the nature of the relationship between variables in the real world (Porter and Carter, 2000). Applying these research designs, the study described, examined, and determined the relationship of the Accounting Competencies of the participants and their Verbal and Non-verbal Abilities as variables of interest.

The study participants were the fourth year BS Accounting Technology students of UM Digos College who already took up the OLSAT exam just this first semester of the school year 2015-2016, and took up Basic Accounting subject to Managerial Advisory Services One, following the prospectus of UMDC. However, the selection of participants does not limit to the reason above.

The fourth-year students were the respondents because of their credits and experiences from basic to higher accounting subjects. By that, those students are

Table 1. Demographic Profile of BSAT Students in UM Digos College

Profile Variables	Frequency	Relative Frequency (%)
Sex		
Male	6	18.8
Female	26	81.3
Age		
18-19	18	56.3
20-21	10	31.2
22 above	4	12.5
Secondary Education		
Public	22	68.8
Private	10	31.3
Residence		
Digos City	23	71.9
Hagonoy	2	6.3
Sulop	1	3.1
Kiblawan	1	3.1
Malalag	1	3.1
Bansalan	1	3.1
Matanao	1	3.1
Padada	1	3.1
Outside Davao Sur	1	3.1
Total	32	100

enduring the hardship of the subject supported with their school abilities in verbal and non-verbal for almost four years. Moreover, they can relate the words used in the Accounting Competency Test. In that case, then they can reliably measure their competencies in accounting. Among the thirty-two (32) respondents, there are more females (81.3%) than males (18.8%). This case was explained by Simon et al. (n.d.) that females' dominance in the accounting field usually happens because females attract and more conscious than males with regards to professionalism, which Certified Public Accountants have. Furthermore, CPAs or accountants sound, look and act professionally. In terms of age, there are 56.3% who are 18 to 19 years old, 31.2% who are 20 to 21 years old, and 12.5% who are 22 and above years of age. The majority of them are 18 to 19 years old since this is the typical age of fourth-year college students. Almost three-fourths of the respondents came from public high schools (68.8%), while 31.3% came from private high schools. In terms of residence, 71.9% live in Digos City, 6.3% in Hagonoy, and 3.1% each in Sulop, Kiblawan, Malalag, Bansalan, Matanao, Padada, and outside the province of Davao del Sur. Students residing in Digos

City have the highest percentage because of accessibility since UM Digos College can just be found within the city.

There were two instruments used with this research to measure the level of school ability and accounting competency of BSAT students in UMDC. Firstly, is the **Otis-Lennon School Ability Test (OLSAT)**. This measures the level of Verbal and Non-verbal abilities of the participants of the study. The OLSAT is used by UM Digos College Guidance and Testing Center to measure and monitor the school ability of all its incoming first-year and fourth-year students. The test composed of Verbal, which composed of Verbal Comprehension and Reasoning, and Non-verbal, which includes Figural Reasoning and Quantitative Reasoning. Secondly is the **Accounting Competencies Test**. This is made up through reliable sources such as Practical Accounting and other reviewers. The three Certified Public Accountants validated this test.

To address the study's objectives, the following statistical treatment was used the *frequency and relative frequency*, which was used to get the number of respondents and its relative percentage in every profile variable of fourth-year BSAT respondents. *Mean* was used to get the average score of the test results. Thus, this was the basis for determining the participants' level of school ability measures and accounting competencies. On the other hand, *Statistical Correlation* was used to determine the strength and significance of the relationship between the accounting competencies and its five components and between the two components of school ability measures and accounting competencies. Lastly, *Multivariate Regression Analysis* was used to determine the amount of contribution of verbal comprehension and reasoning to verbal ability, and quantitative and figural reasoning to non-verbal ability, as predictors.

RESULTS AND DISCUSSION

The School Ability Measures of Fourth Year BSAT Students of UMDC

Table 2 presents the data of the fourth year BS in Accounting Technology students of UM Digos College on their level of School Ability Measures. The level was measured in terms of its components, such as verbal and non-verbal. Verbal Component with its dimensions, verbal comprehension, and verbal reasoning. Non-verbal component with its dimensions, figural reasoning, and quantitative reasoning.

Table 2. *Descriptive Statistics of School Ability Measures*

School Ability Measures	Min	Max	SD	Mean	VD
Verbal	10	30	5.31	19.06	Below Average
Verbal Comprehension	3	11	2.42	7.03	Below Average
Verbal Reasoning	4	21	3.79	12	Below Average
Non-Verbal	12	35	6.85	25.13	Average
Figural Reasoning	5	18	3.96	12.31	Average
Quantitative Reasoning	5	18	3.39	12.84	Average
Total	22	61	10.79	44.19	Below Average

It can be gleaned in the results that in terms of verbal ability, the overall mean is 19.06 with a standard deviation of 5.31, described as "below average." This means that they are low in language intelligence. The dimensions under this component have mean scores that have a verbal description of "below average."

The dimension with the highest mean is "Verbal Reasoning" with a mean score of 12 and a standard deviation of 3.79. Simultaneously, the item with the lowest means is "Verbal Comprehension" with a mean score of 7.03 and a standard deviation of 2.42. This means that in terms of verbal ability, they are more constructive thinkers rather than vocabulary-oriented.

In terms of non-verbal ability, the overall mean is 25.13 with a standard deviation of 6.85, described as "average." This means that their level of ability in non-verbal is within the normal range of visual reasoning. The dimensions under this component have mean scores that have a verbal description of "average." The dimension with the highest mean is "Quantitative Reasoning" with a mean score of 12.84 and a standard deviation of 3.39. In contrast, the dimension with the lowest means is "Figural Reasoning" with a mean score of 12.31 and a standard deviation of 3.96. This means that in terms of non-verbal ability, they are more comfortable dealing with numbers rather than working with figures.

The Accounting Competency of Fourth Year BSAT Students of UMDC

Table 3 presents the data of the fourth year BS in Accounting Technology students of UM Digos College on their level of Accounting Competencies. The level was

measured in terms of its components such as basic concept, analysis, problem-solving, decision making, and communication.

Table 3. *Descriptive Statistics of Accounting Competencies*

Accounting Competencies	Min	Max	SD	Mean	VD
Basic Concept	4	14	2.39	9	Average
Analysis	1	6	1.28	3.65	Average
Problem Solving	0	9	2.2	3.71	Average
Decision Making	0	3	1.1	1.56	Below Average
Communication	0	13	3.58	6.15	Below Average
Total	12	40	6.43	24.09	Average

It is revealed in the table that the total items of Accounting Competencies were fifty-five (55), with the minimum score of twelve (12) and a maximum of forty (40), a total result of Standard Deviation 6.43, and a total mean score of 24.09 described as Average.

It was found out that in the Basic Concepts, out of fifteen (15) items, the minimum score is four (4) and the maximum is fourteen (14) with the result of Standard Deviation 2.39, and a mean score of 9, which the verbal description is Average. In the Analysis level, out of ten (10) items, the minimum score is one (1), and the maximum is six (6) with the result of Standard Deviation 1.28, and a mean score of 3.65 described as average. In the Problem-Solving level, out of ten (10) items, the minimum score is zero (0), and the maximum is nine (9) with the result of Standard Deviation 2.2 and a mean score of 3.71 described as average. In the Decision-Making level, out of five (5) items, the minimum score is zero (0), and the maximum is three (3) with the result of Standard Deviation 1.1, and a mean score of 1.56 described as below average. In the last level of Accounting Competencies, which is the Communication, out of fifteen (15) items, the minimum score is zero (0), and the maximum is thirteen (13) with the result of Standard Deviation 3.58. The mean score is 6.15 described as below average.

The researchers found out that in the accounting competencies level; basic concept described as average, which explains that the 4th year BSAT students were found to have a good foundation in basic terms and concepts in accounting while analysis, and problem-solving which are also labeled as average, implies that the 4th year BSAT students were found to have been on their normal range of being a critical thinker in terms of computation, and analysis of transactions that lead to judgment and application of accounting principles. Moreover, with regards to

decision-making and communication, which is described below average, the respondents are at a low level in terms of effective decision-making and communication or explanation of results based on their analysis and judgment.

Relationship of School Ability Measures and Accounting Competencies

Between the two components of school ability measures, verbal ability, being an independent variable, is indicated to have a significant relationship to accounting competencies. It has a p-value of 0.001. The strength of its relationship is moderately low as it has an r-value of 0.566.

Table 4. *Relationship of School Ability Measures and Accounting Competencies*

Independent Variable	Dependent Variable	Pearson r and p-value	Relationship	Remark
Verbal	Accounting Competencies	0.566	Moderately low	S
Non-verbal		$p=0.001$		
		0.279	Low	NS
		$p=0.122$		

On the other hand, the table above reveals that non-verbal has no significant relationship to accounting competencies since the p-value is 0.122. The strength of its relationship is low as it has an r-value of 0.279.

Path Analysis Result

This section presents the result of the regression analysis conducted on the different variables of the study to trace the path of correlations to identify the significant predictors of students accounting competencies.

The first analysis is on the verbal component of the school ability test. It was found that both its dimensions, such as Verbal Comprehension and Verbal Reasoning, are significantly correlated to it. It can also be noted that both Verbal Comprehension and Verbal Reasoning are significantly correlated to each other.

These are consistent with the previous researches that the two dimensions above are the predictors of Verbal Ability. As emphasized by Richard and Roger (1986), Verbal Ability is the intelligence of a person's performance in a language that includes comprehension and reasoning.

Furthermore, the two dimensions are sequentially interrelated from each other. Comprehension is a key element in verbal reasoning because it involves

constructing meaning using the information given and how the readers will reason before their knowledge. Although, Verbal reasoning and Comprehension are not the same things, having skills in critical reading is one of the most useful aspects of verbal reasoning (Burton et al. 2009).

Wagner and Stanovich (1996) also emphasized that reading and comprehension are especially likely to be substantial contributors to verbal reasoning's cognitive growth. Comprehension characterizes as an active process that involves building a mental representation of the text, "constructing meaning," calling up relevant knowledge from memory, evaluating differences between text and the reader's existing knowledge and beliefs, making inferences needed to fill gaps in understanding or clarify the meaning, integrating pertinent new information into the reader's knowledge base, and thinking about what are the important and unimportant points in the text and how the information can be used to enhance verbal reasoning of oneself (Chapman, 1993; Sweet, 1993). In general, the reasoning is always required when the reader is first learning to read or is confronting new content. As the reader becomes more proficient, and as his or her knowledge of the content grows, reading comprehension becomes more automatic, requiring less reasoning at a conscious level.

To further determine the amount of verbal comprehension and verbal reasoning to verbal, multivariate regression was done using the enter method. It was found that both verbal comprehension and verbal reasoning are significant predictors of verbal. The prediction equation could now be put as $Y = -0.033 + 1.003 x_1 + 1.004 x_2$, where x_1 is the students' Verbal Comprehension and x_2 is the students' Verbal Reasoning.

Second, the non-verbal component of the school ability test was examined. Both its dimensions, quantitative reasoning and figural reasoning, are significantly correlated to it. Surprisingly, the students' quantitative reasoning and figural reasoning are also correlated.

These are in unity with the discussion by the University of Kent, a European Institution, that non-verbal reasoning involves the ability to understand and analyze visual information and solve problems using visual reasoning. It analyzes and solves complex problems without relying upon or being limited by language skills. Thus, this explicitly stated that figural reasoning and quantitative reasoning are dimensions of non-verbal ability.

Moving further about its dimensions, according to the Otis-Lennon School Ability

Test (OLSAT), quantitative reasoning is the ability to infer and understand relationships with numbers, deduce and use computational rules in context. On the other hand, figural reasoning can infer relationships between different geometric shapes and figures, understand patterns and progressions, compare and contrast different figures or sets of figures and manipulate and work with figures in a spatial context. Hence, these two dimensions of non-verbal are sequentially interrelated. Although they have overlap in meaning, they are considered slightly different and not fully interchangeable. They all have in common that they address your ability to understand and analyze visual information and both apply logical thinking and mathematical knowledge to the solution of pictorially presented problems. The understanding is built first with quantitative problems and followed by abstract understanding.

Prediction model for non-verbal ability measure

Predictors	Dependent Variable	Pearson r	p-value	Unstandardized Beta Coefficients
Figural Reasoning	Overall Non-Verbal Ability	.944	.000	1.010 ^s
Quantitative Reasoning	Overall Non-Verbal Ability	.919	.000	.985 ^s
Constant				.034

Prediction model for verbal ability measure

Predictors	Dependent Variable	Pearson r	p-value	Unstandardized Beta Coefficients
Verbal Comprehension	Overall Verbal Ability	.761	.000	1.003 ^s
Verbal Reasoning	Overall Verbal Ability	.910	.000	1.004 ^s
Constant				-0.033

To identify the degree of influence of the two dimensions of Nonverbal, multivariate regression analysis was also performed. It was found that both Figural Reasoning and Quantitative Reasoning are significant predictors of Non-

verbal. The prediction model is now written as $Y = 0.034 + 1.01x_1 + 0.985x_2$; where x_1 is the students score in Figural Reasoning and x_2 is the students score in Quantitative Reasoning.

Third, a similar analysis was performed on the endogenous variable of this study: the Accounting Competency, as measured by the Accounting Competency Test. There were five constructs considered: knowledge of basic concepts, analysis, problem-solving, decision-making, and communication. It was found that all these five dimensions significantly correlated with the overall accounting competency.

Prediction model for accounting competencies

Predictors	Dependent Variable	Pearson r	p-value	Predictors
Basic Concept	Overall Accounting Competencies	.594	.000	Basic Concept
Analysis	Overall Accounting Competencies	.511	.003	Analysis
Problem Solving	Overall Accounting Competencies	.557	.001	Problem Solving
Decision Making	Overall Accounting Competencies	.632	.000	Decision Making
Communication	Overall Accounting Competencies	.679	.000	Communication

These are consistent with the previous research cited in the literature review that these five are predictors of being accounting competent. According to the research, those dimensions above are the strong needs in the workplace such as decision-making, problem-solving, and communication (Foster and Bolt-Lee, 2015), whereas the last two mentioned are named soft-skill competency study of Abbasani (nd). This further implies that the higher the skills of those dimensions, the more competencies an accountant possessed.

Edmonds et al. (2011) also mentioned analysis. According to him, this will improve through acquiring a formal accounting education. The said ability

focused on financial information and application of principles, which means that the analytical thinking serves as the assessor of those to perform accounting practice. Thus, it is a component of the overall accounting competencies. Moreover, Basic Concepts Knowledge also correlates to it since it involves studying theories and principles towards application. Ballada (2012) also considered this as one of the core competencies. However, no correlations were found among them.

For the relationship of the two dimensions of the school ability test, namely verbal and nonverbal, and the accounting competency test, it was found that only verbal ability had a positive direct correlation with the accounting competency test scores. On the other hand, the nonverbal ability was found to have an insignificant association with accounting competencies. Although accounting indeed subsumes working with numbers, which talking about the numerical matter is non-verbal, it must be noted that accounting encompasses outside the limits or range of numbers and involves gathering and preparing reliable information (Siddiqui, 2014). The said information must be comprehending first before an application that deals with numbers. In the accountancy field, guiding principles are the basis of solving problems or numerical manipulation like the valuation of assets, liabilities, and equity, and even recording foreign currency transactions. According to Certified Public Accountants, it is almost enough if the students know the concepts and principles. It follows that students can manipulate the numbers or financial information in accounting problems based on the read theories and principles. In which knowing and application of those involve verbal comprehension and reasoning. Those are the supporting reasons why verbal significantly predicts more the accounting competency while nonverbal is not a secondary one.

Moreover, Donges (2001) stressed that even mathematics, which is non-verbal, requires verbal reasoning because it is generally taught through oral and written instruction. Thus, comprehension and verbal reasoning come first before the non-verbal learning phase. Meanwhile, in connection to that towards accounting, even if the student is good in mathematics, if he or she cannot understand the standards or guiding principles of accounting like the Philippine Accounting Standards or PAS and the Philippine Financial Reporting Standards or PFRS, and consequentially does not know how to apply it, then that student will not be competent in that case because of arriving a wrong solution and answer of the accounting problem. For instance, in the case of foreign currency financial statements translation, there are different exchange rates known such as spot rate, closing rate, presentation currency, weighted average rate, and the rate at declaration date, if the students cannot understand the transaction and PAS 21,

which governs that certain problem, students shall end up of guessing, multiplying with wrong numbers. As a result, students cannot explain their work appropriately. Moreover, this kind of problem also requires verbal reasoning skills for application purposes to assess the understanding on which appropriate rate shall be used in the certain account title under the standards and to explain the work correctly.

As an implication, in pursuing an accounting course, it does not need to be excellent in mathematics because it only necessitates knowledge of basic mathematical operations. Accountants will not work without a calculator on hand. Accounting needs more of students' verbal ability since this field is dominant with analysis and requires understanding the transaction, accounting terms that have no translation into another language, and standards or guiding principles.

On the other hand, this result does not discourage Non-Verbal Ability. Although it does not directly and significantly correlate to the accounting competencies, it can help through indirect connection to accounting competencies through passing with the verbal ability since those two school ability measures are significantly correlated with each other as illustrated in the path model hereafter. The non-verbal ability is somehow useful since accounting still includes numbers.

However, as an overall assessment, only the students' verbal abilities can significantly predict their accounting competencies in the regression analysis. The regression model is now $Y = 12.32 + 0.645 x_1$; where x_1 is the verbal ability

Figure 2 (Path Model) shows the path analysis of the school ability test and accounting competency. This exploration stresses that students' accounting competencies are determined by students' verbal abilities, which is determined by two dimensions: verbal comprehension and verbal reasoning. This is called direct effects. This further means that improving verbal comprehension and verbal reasoning will improve verbal ability and, consequently, accounting competency. This analysis also emphasizes the indirect effects of nonverbal ability on accounting competency. This means that nonverbal abilities like quantitative reasoning and figural reasoning are secondary predictors of accounting competency. Remarkably, verbal and nonverbal abilities are also directly correlated.

To sum it up, the path shows that verbal ability significantly influences the accounting competencies and not the non-verbal on where a sort of mathematical knowledge belongs. This is the answer to the very aim of this research study

mentioned in the problem statement. This result can contradict the other researches who enlightened that mathematical skills were determined to be the fundamental scholastic knowledge required for successful accounting students and are influential over the accounting discipline outperformance (Lee et al., 2014; Zandi and Shahabi, 2012).

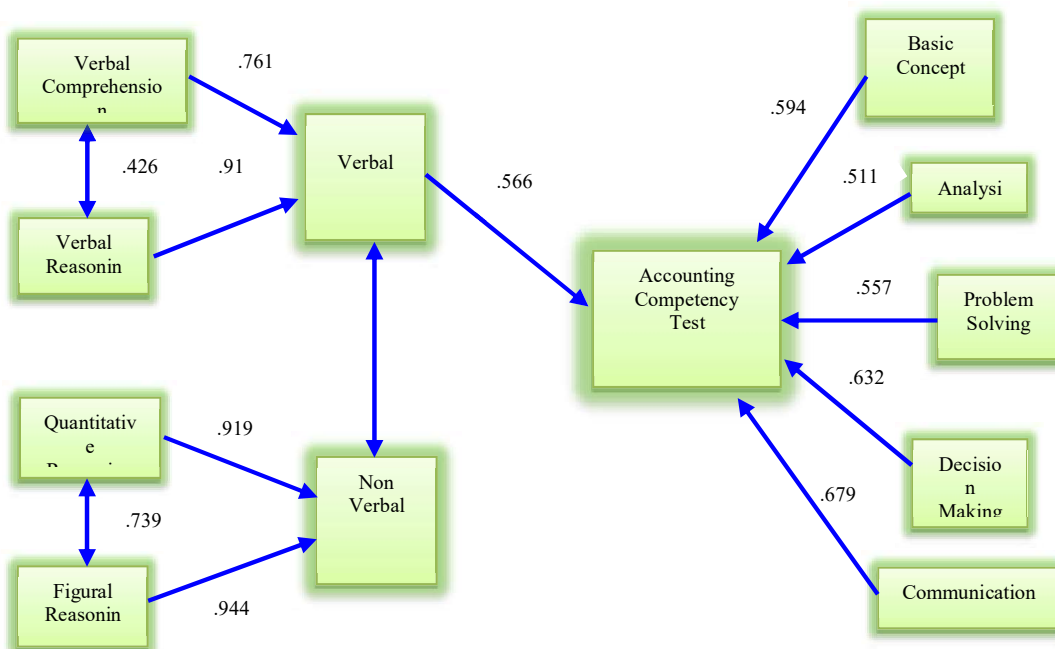


Figure 2. Path Model

CONCLUSIONS AND RECOMMENDATIONS

This study aimed to determine School Ability Measures on Accounting Competencies of the fourth year BSAT students in UM Digos College using the Path Analysis. This study employed the non-experimental quantitative method of research. Primary data were gathered through the use of test questionnaires. The first set used was the Otis-Lennon School Ability Test (OLSAT), which measures the study participants' level of verbal and non-verbal abilities. In contrast, the second set was the test to measure the respondents' accounting competencies to assess their learnings and capabilities in accounting. Frequency and relative frequency, mean, statistical correlation, and multivariate regression analysis were

utilized as the primary statistical tools to test the study's hypotheses. Based on the analysis of the data and interpretation of the results, it was found out that the overall level of school ability measures of the fourth year BSAT students in UMDC is described as "below average." This means that the participants are low in intellectual and academic ability. In connection to this, their verbal ability is labeled as "below average." This attests that the respondents are low in language intelligence.

On the other hand, their non-verbal ability is identified as "average." This means that the participants perform at the normal range in terms of visual reasoning, including numerical ability. Secondly, the overall level of accounting competencies of the fourth-year BSAT students in UMDC is described as "average." This means that the participants are mean competent in the field. Lastly, verbal ability significantly predicts between the two school ability measures and has a direct influential effect on accounting competencies. On the other hand, the non-verbal ability is a non-significant predictor and has indirect effects on accounting competencies.

Based on the study's findings and conclusions, the researchers recommend that those prospect accounting pursuers, who possessed a good verbal ability, may have their confidence in taking the course. Moreover, those students, who desire to pursue accounting courses with a below average in verbal ability, may improve this to increase their accounting performance or competency. On the other hand, although accounting course does not require the students to be excellent in mathematics since it only necessitates knowledge of basic mathematical operations in terms of non-verbal ability, students may still consider this and improve their quantitative reasoning or figural reasoning skills to indirectly and influentially increase their accounting competencies. Moreover, the accounting education program head may suggest adding high relative subjects to verbal comprehension and reasoning to consequentially enhance and help the accounting students take the course. Further, those colleges or universities with an entrance exam for the accounting students' qualification may add the verbal ability as the primary consideration of the entering students rather than referring only to their mathematical ability. Lastly, in the future, researchers may refer to this study as a reference or a basis for experimental research to validate and strengthen this study by studying the effect of verbal ability on accounting competencies.

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