INVESTIGATING THE BODY MASS INDEX AND ACADEMIC PERFORMANCE AMONG THE TECHNOLOGY EDUCATION STUDENTS IN A STATE UNIVERSITY IN NORTHERN MINDANAO: A MIXED-METHOD RESEARCH DESIGN

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ABSTRACT. *This research utilized the Sequential Explanatory Mixed-method Research Design to investigate the BMI and Academic Performance of the Technology Education students in a State University of Northern Mindanao. In this design, a researcher first collects and analyzes the quantitative part regarding BMI and their Academic Performance among the respondents. The Phenomenological qualitative phase was conducted to collect interviews and analyze second in the sequence and help explain, or elaborate on, the quantitative results obtained in the first phase. The correlation coefficient (r) between BMI and Academic Performance is -.169. This indicates that the BMI and academic Performance are very low correlated. There is no significant relationship between BMI and Academic Performance among the respondents. The coefficient of determination (r²)is only 0.029. This means that BMI explains only 2.9% variation in Academic Performance, and 97.1% of the variation can be attributed to other variables. Following the direct content analysis approach, two main themes emerged in the data analysis on how do the respondents define Academic Performance. These two main themes are labeled (a) Oriented and (b) Motivated. It is recommended in this paper that proper guidance, support, and motivation from external and internal people of a student that exists in their life during college should be adequately addressed. Second, a good plan orientation and determination among the students' lives will help them attain their daily tasks in attending their classes in a University. It is suggested that other variables may be explored that would connect to the students' academic performance in a university. Secondly, this study is limited only to the technology education program, and it might be good also to conduct this study on other programs in a University. Lastly, a longitudinal study is suggested so that future research may explore the trends of their Academic Performance over a period of time, and the results would detect developments or changes in the characteristics among the students attending university classes.*

Key Words: *Body Mass Index BMI, Academic Performance, Sequential Explanatory Mixed-method Research Design*

1. INTRODUCTION

Most students in the Philippines expressed fear of failure [1]. As observed, many factors will contribute to failures among college students in attending their classes in University. Physical health problem is one of the risk factors for academic failure [2] and students with poor health have a higher probability of school failure, grade retention, and dropout [3]. The most frequently used tools in public health evaluations and clinical screening in school are anthropometric-based measurements such as skinfold-thickness or circumference measurements or various height- and weight-based indexes such as weight-for-height, body mass index BMI [4]- [6]. The BMI is a tool used by healthcare professionals to help estimate a person's risk for chronic disease [7]. In fact, youth who perceived themselves as overweight were less likely to report higher grades [8].

Education promotes social mobility and therefore contributes to improving equity [9]. This is why every task force in the institution must see to it that all learners are able to attain their goal in learning. School administrators must see that quality assurance must become an essential part of institutional management and planning [10]. The learners must be motivated to learn and finish their degree on time to find a secured job in the future. Motivation is fascinating to examine because it is malleable and may substantially impact outcomes[11].

There might be a great interrelatedness to study BMI as one of the predictors in health and Academic Performance if these two variables are correlated. As has been commonly known to us, that health is our greatest wealth. There would be a problem in achieving any goals if there is a health issue of an individual, specifically the students attending classes in a University. Also, is it an essential factor to consider to study what motivates the students to perform the school-related tasks? Primarily, the result of this study can significantly contribute to the life of the students in attending classes in a University.

2. METHODOLOGY

Research Design

This research utilized the Sequential Explanatory Mixed-method Research Design to investigate the BMI and Academic Performance of the Technology Education students in a State University of Northern Mindanao. The study was conducted during the whole 2nd semester of the respondents during their course in Physical Education 4, in School Year 2018- 2019, wherein the researcher is the instructor of this course. The researcher first initiated a consent by sending a letter to the Dean's college office and to the respondents. In order that information of the respondents will be treated confidentiality in the data gathering procedure, their information was to be completely removed [12]. Meanwhile, the researcher observed the ethical consideration in data gathering by explaining these to the respondents. They are participating in research, the purpose of the research (without stating the central research question), the research procedures, the risk and benefits of the study, the voluntary nature of research participation, and the processes used to protect

confidentiality [13].

The mixed-methods sequential explanatory design consists of two distinct phases: quantitative and followed by qualitative [14]. In this design, a researcher first collects and analyzes the quantitative part regarding BMI and their Academic Performance among the respondents. The Correlational Analysis was used to measure the significant relationship between the two variables using SPSS. In addition, the BMI is the average of the preterm period and post-term period of each respondent. The BMI was gathered during the first week and last week of the semester to obtain the average of each respondent's BMI. Also, the academic Performance is the final average grade of all taken courses of each respondent during this semester, which was gathered from the University registrar upon permission.

The in-depth interviews phase builds on the first quantitative phase, and the two phases are connected in the intermediate stage in the study. The Phenomenological qualitative phase was conducted to collect interviews and analyze second in the sequence and help explain, or elaborate on, the quantitative results obtained in the first phase. The rationale for this approach is that the quantitative data and their subsequent analysis provide a general understanding of the research problem. The qualitative data and their analysis refine and explain those statistical results by exploring participants' views in more depth [15]. During the interview, the researcher used their own phrasing for asking each question, used additional probes or prompts if necessary, and used a communication style that felt comfortable and natural to the interviewees [16].

To conclude, in the first phase of data gathering, which is the quantitative part, the researcher utilizes the inferential statistics Correlation Coefficient to examine the relationship between BMI and Academic Performance. To explain the result of the quantitative part, a phenological qualitative study was conducted to explored the emerging themes that will answer the "WHY" question of this study.

Participants of the Study

The study participants comprised of 2nd-year students taking Bachelor of Technology and Livelihood Education (BTLED) at a University of Science and Technology of Southern Philippines, Cagayan de Oro campus, during the 2nd semester of the school year 2018-2019. There were 109 student-participants who were selected through a purposive sampling technique, which compromises the department's entire four sections. The demographic profile of the respondents is presented in Table 1.

Table 1. Demographic Profile of the Respondents in terms of BMI and Academic Performance

BMI			Academic Performance		
Overweight	9	8%	Above Average	84	78%
Normal	67	62%	Very Good	5	5%
Underweight	33	30%	Average	18	17%
TOTAL	109	100%	TOTAL	109	100%

3. RESULTS AND DISCUSSION
The BMI and Academic Performance Among the Respondents

Table 2. A significant relationship between Academic Performance and BMI of the respondents(n=109)

Variables	r	r^2	P	Interpretation
BMI				
	-.169	0.029	.080**	Not
Academic				significant
Performance				

**Correlation is not significant at the 0.05 level (2-tailed).

Table 2 shows the significant relationship between BMI and the Academic Performance of the respondents. The correlation coefficient (r) tells the degree of association and indicates how linearly associated are the BMI and Academic Performance. The correlation coefficient (r) between BMI and Academic Performance is -.169. This indicates that the BMI and academic Performance are very low correlated. The linear relationship is not strong. There is no significant relationship between BMI and Academic Performance among the respondents since the p-value is above 0.05. The coefficient of determination (r²)is only 0.029. This means that BMI explains only 2. 9% variation in Academic Performance, and 97.1% of the variation can be attributed to other variables. This means that whether the respondent's BMI is normal or not, it will not affect the Academic Performance. The BMI of the respondents has no relationship with their Academic Performance.

The result was also supported by the study of Wehigaldeniya et al.[17] that BMI is not related to the Academic Performance among college students of Sri Lanka. Also, the study of He et al. [18] revealed that BMI is weakly and negatively associated with academic achievement from the data of 60 selected studies (involving 164,049 participants) that were extracted and analyzed following procedures for meta-analysis.

What is Academic Performance among the Respondents?
The findings presented in this section sought to answer "How do the respondents define Academic Performance?" Personal interviews were done to collect the data to provide an in-depth definition of Academic Performance. A directed content analysis approach was employed in the thematic analysis of the data from eight personal interviews conducted.

Following the direct content analysis approach, two main themes emerged in the data analysis. These two main themes are labeled (a) Oriented and (b) Motivated. Excerpts of the participants' narratives during the interview with their corresponding codes, categories, and themes are presented in Table 3.

Table 3. Themes that emerged from the personal interview data

Codes	Categories	Emerging Themes
The ability of the student to perform the task in school	School Task Performer	
Proper time	Proper time	Oriented

management is important to function as a student	management	
Determination to pursue studies	Well determined in school task	
		Motivated
Academics can also be influenced externally	Externally Influenced	

Oriented

The Oriented theme has two categories, the school task performer and the proper time management. During the interviews, respondents shared that a student should be oriented in his tasks and perform the tasks on time to be an efficient student.

The ability to perform the tasks will make the students perform academically in school. Thus, Student 1 mentioned that *"my body structure can't affect my everyday performance in my class as long as I am capable of the things that I am doing in my class."* Student 2 said, *"academic performance is the ability of the student to perform all the tasks in school. It is how the student performs all the tasks related to school".* In addition, proper time management is also essential for student to perform in their academic activities. Student 3 said, *"there should be time management in his study and other non-academics tasks. He should know how to manage time correctly. The students should develop the self-learning ability to learn best".* Student 4 also said, *"the important thing, students should be attentive and participative during the class discussion given by the instructors."*

This study was confirmed by Lu et.al [19] that students who have a high Learning Goal Outcome in their first month after entering the University have higher academic self-efficacy. This was also confirmed by the study of Supervía & Bordás [20] that Students' Goal Orientation plays a key role in promoting adaptive behaviors in an academic context and in the personal and educational development of the adolescent students in Spain. In addition, metacognition will directly influence the goal orientation, which increases the students' academic achievement [21]. To conclude, studies confirm the students' goal orientation has can significantly improve their Academic Performance [22]–[25].

Motivated

The Motivated theme has two categories, namely, the well determined in school task and externally influenced. During the interview, the respondents are motivated if they are well determined and influenced by the surrounding people while they are studying.

The academic performance can be based on their determination, as said by student number 5, "*I should focus as a student to perform my best in our class. In order to perform my best, I should be mentally prepared in attending my classes*". Also, family, friends, and instructors will greatly contribute to performing academically; as said by student number 6, *"my learning was great because of my friends, family, and professors who always motivated me to continue my study".* This was also confirmed by students number 7, *"I was able to perform my task because my friends also perform their tasks. They greatly influence me to perform my class tasks. Whenever we go together, my friends, whom my classmates will always include discussion like our school activities".* Student number 8 also said, *"my professors are very responsive to our queries, it will bring me to do in my study. I am happy if my professor will always encourage us to perform our class tasks".*

The result was supported by the study of Chiu & Chow [26] that classmates can influence a student's academic achievement through immediate interactions (e.g., academic help, positive attitudes toward reading) or by sharing tangible or intangible family resources (books, stories of foreign travel) among the 33 countries. Their paper found out that classmates might help a student by motivating a better attitude toward reading, more fantastic study time, or further perseverance. While students can determine and set their achievement goals, it is also essential to acknowledge that these goals can be directly influenced by the goals of their classmates [27]. This is because the positive contagion among classmates can greatly influence them to perform their tasks in school [27]. Indeed, perceived classmate support was significantly associated with the academic initiative at the individual level [28].

The family-oriented motivation was related to Academic Performance, where family motivation and individual motivation were relatively strong and consistent [29]. This is also true that parental incarceration, family income, better-educated parents are more likely to consider influencing student achievement [30]. In contrast, the family background does not jointly affect the achievement motivation of college students [31]. What is important is that the students should have a positive motivation in their Academic Achievement [32]- [33] with the support of their family [30].

Teachers must establish a positive relationship with their students to provide the learning opportunity and motivation they need to be successful in both academic and life lessons [34]. A study showed that the level of self-determined motivation in students, which was directly related to the perception of teachers' autonomy support, was the best predictor of the intention to drop out of school [35]. Also, teacher self-efficacy positively influences the students' motivation and achievement [36]. To conclude, motivation is the driving force of the students to perform academically by achieving targets and the process to maintain the drive [37].

4. CONCLUSION AND RECOMMENDATIONS

This study was able to find out that BMI has no relation to the Academic Performance among the technology education students in a state University in Northern Mindanao. What makes them ignite their Academic Performance is when they are oriented and motivated. Therefore, it is recommended in this paper that proper guidance, support, and motivation from external and

internal people of a student that exists in their life during college should be adequately addressed. This includes the family, friends, and professors that play an essential role in shaping the students' lives to be motivated to perform academic work. In addition, a good plan orientation and determination among the students' lives will help them attain their daily tasks in attending their classes in a University.

Limitations of the Study

Although this paper was able to deeply explore the meaning of Academic Performance among technology education students, it is suggested that other variables may be explored that would connect to the students' academic performance in a university. Secondly, this study is limited only to the technology education program, and it might be good also to conduct this study on other programs in a University. Lastly, a longitudinal study is suggested so that future research may explore the trends of their Academic Performance over a period of time, and the results would detect developments or changes in the characteristics among the students attending university classes.

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