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LEARNING BEHAVIOR AS PREDICTOR OF MATHEMATICS ACHIEVEMENT AMONG GENERATION Z LEARNERS

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ABSTRACT

This study dealt with the learning behavior as a predictor of Mathematics achievement among the generation Z learners of Mawab District. Determining the influence of learning behavior on the mathematics achievement of Generation Z learners of Mawab District is the essential objective of the study, utilizing quantitative—nonexperimental design applying the causal effect technique with regression analysis with a total of 281 respondents among senior high school students of the four secondary schools of Mawab district. The measurable instruments utilized in this study were the Mean, Pearson r, and the Multiple Regression Analysis. Results showed a very high level of learning behavior as a predictor of the mathematics achievement among the generation Z learners of Mawab district in competence motivation, attitude towards learning, attention, and flexibility. Moreover, the Mathematics achievement and the learning behavior of Generation Z learners of the Mawab district have a significant relationship. Also, all the domains of learning behavior significantly influence Mathematics achievement. Thus, the better the learning behavior a learner has toward a subject or undertaking, the higher the accomplishment or execution level in Mathematics.

KEYWORDS: MAED-Teaching Mathematics, learning behavior, Mathematics achievement, Generation Z, Philippines

Chapter 1

INTRODUCTION

Rationale

According to the data from national assessments, American children tend to enjoy Mathematics in elementary school grades. Still, as they graduate from high school, their level of enjoyment tends to drop dramatically. Students think Mathematics is important, but their grades are steadily declining. More so, in Lithuania, an increasing number of students have poor Mathematics achievement at universities. It was realized that the passing rate of the pupils in the national final exam of Mathematics was lower than the previous year (Malaukytė, 2017; Middleton & Spanias, 2016).

When combined with the fact that the firm foundation of Mathematics is essential, this information seems alarming because it enables children to gain a new and improved knowledge of Mathematics,

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contributing to successful participation in higher education and the emergence of a knowledge-based society. Mathematics achievement is an integral part of many aspects of student life. These factors include time, money, and budget, the legitimacy for others, advocating for rights, identifying and generalizing signs and models, using technology, defining information, thinking systematically and creatively, creating things, and solving problems (Gronmo et al., 2015).

A few examinations support how the learners' achievement in mathematics relies upon the learning behavior of learners concerning the subject since this decides their capacity, want to learn, selection of activities, and reaction to challenges. It determines the degree of association, interest, and personal effect, without which it is hard to work (Garden & Smith, 2015).

In Region XI, particularly in Mawab, schools are not free from the students' prevailing dilemmas of Mathematics achievements. The situations cited above are closely identical to what is happening in the said schools. Thus, the learning behavior of the Generation Z learners may somehow attribute to the prevailing predicament influencing the mathematics achievements of the students. However, the previous researchers have not come across a study that is the same as the research undertaken. Thus, this provoked the researcher to lead the examination to explore the influence of learning behavior. In this context, the researcher is interested in determining whether the learning behavior of Generation Z learners predicts their Mathematics achievement.

Research Objective

This study is conducted to determine learning behavior as a predictor of Mathematics achievement among generation Z learners in Mawab District. Specifically, the research led to seek answers to the following objectives:

1. To describe the level of learning behavior of Generation Z in terms of:

    1.1.competence motivation;

    1.2. attitude toward learning;

    1.3. attention; and

    1.4. flexibility.

2. To describe the level of Mathematics achievement of Generation Z in terms of:

    2.1. communication;

    2.2. mental Mathematics; and

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2.3. problem-solving.

3. To find out the significant relationship between the learning behavior and Mathematics achievement of Generation Z learners; and
4. To determine what domain in the learning behavior significantly predicts the Mathematics achievement of Generation Z learners.

Hypotheses

At 0.05 level of significance, the following hypotheses are verified:

1. There is no significant relationship between learning behavior and Mathematics achievement of Generation Z learners.
2. There is no domain in the learning behavior that significantly predicts the Mathematics achievement of Generation Z learners.

Review of Related Literature

Presented in this section are the theories, ideas, facts, data, views, and readings related to learning behavior and the Mathematics achievement of Generation Z learners.

The independent variable is the learning behavior based on competence motivation, attitude toward learning, attention, and flexibility (McDermott et al., 2001). The dependent variable is Mathematics achievement in communication, mental Mathematics, and problem-solving (Alberta Education, 2007).

Learning Behavior

Generation Z, known as "Digital Natives", "Me Generation," and "Generation N," was born between 1995 and 2012. Their predecessor was mainly Generation X. In addition to the previous generation, the development of the behavioral characteristics of Generation Z is significantly shaped and influenced by the variety of environment and the surrounding elements. They are growing up with a very sophisticated media and technological environment that has made them an internet savvy nation and more expert than their predecessors. Learning behavioral skills are indicated by motivation, attitude towards learning, attention, and flexibility (Feiertag & Berge, 2015; McDermott et al., 2001). Motivation is an essential formula for academic achievement. It incorporates interior and exterior factors that invigorate the wants and energy in individuals and a constant interest in a task, role, or subject and achieve a permanent goal. One study contended that inspiration discloses why individuals choose to accomplish something, how hard they will seek after, and how long they have been willing to do it. All in all, motivation is the thing that makes you go, makes all the difference for you, and figures out where you are attempting to go (Dornyei, 2015; Slavin, 2017).

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Likewise, motivation is also a mental process that guides behavior or the driver to accomplish objectives and impacts execution. People inevitably can surpass other people's abilities. When one desires to perform better than the achievements of others, one is motivated to advance oneself (Adam & Kamase, 2019).

Besides, the younger generation today thrives on desire and progress in recognition of their efforts. Understandably, youngsters have experienced childhood in a steady well-being net at home, in society, and all through their schooling. As a result, they react to encourage feedback and proceed and additionally improve their behavior. As a much-desired breed, with more attention and material benefits than anyone else, Generation Z would also expect recognition as a sort of motivation (McCrindle, 2019).

Seemingly, competence motivation differs from other motivational speculations and approaches examined and applied in the school. Competence motivation includes a worry of dominance. The motive or provocation for action in a specific direction is developing, achieving, or demonstrating competence. Although the crucial goal of instruction is to make competence, a few endeavors to upgrade learners' inspiration in schools have not fundamentally focused on competence motivation (Urdan, 2015).

In the same vein, children will search for regions where they feel competent and stay away from zones where achievement is either awful or lacking and an absence of a sense of accomplishment. Effective and ineffective efforts to dominate abilities fortify the territory where one moves. It will attract people to the school subjects or the style of games that play in their hands because it gives them a sense of competence and it creates a positive feeling that confirms their ability in the field (DiBello, 2015).

More so, competence motivation is seen in children. The toddlers try to act strong and capable, big and mature, almost immediately after understanding the concepts. Healthy normal children generally want to be considered educated and competent beyond their years. Children of all ages try to control some objects be it a dollhouse, a collection of cars, or something else. In general, people with exceptional talent like to do this. People prefer a subject or sport that "takes advantage of their strengths" because it makes them feel competent (Dewey, 2018).

Meanwhile, attitude may alter each part of an individual's life, including their schooling. The way learners treat learning decides their capacity and want to learn. Except if the negative mentality changes, the learner is probably not going to proceed with his schooling. Changing learners' negative mentalities toward learning is a cycle that includes recognizing the variables that determine that behavior and using it to bring about change (Ministry of Education, 2016).

Similarly, attitude towards learning is an essential factor in learning goal setting, problem-solving skills, confidence in understanding, intrinsic and extrinsic motivation in the learning process, and

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academic performance. A study conducted with a group of college students found that university students' attitudes toward learning base on four sub-measurements: nature of learning, dread, assumption, and receptiveness, their sex, and their scholarly presentation. It shows that hopeful designers and specialized instructors have uplifting perspectives towards learning. Hence, improving learners' mentalities toward education is a significant educational program objective for some nations (Keser, 2015; Mullis & Martin, 2017).

In the same way, disposition towards school and learning is perceived as convictions, musings, and assessments about school and education, feelings, and a relationship towards school and knowledge-based upon emotions, and a propensity to carry on by ideal and troublesome encounters with school and learning. This structure is closely related to other constructs that could be named psychological and non-intellectual establishments of knowledge and scholarly accomplishment. Perspectives towards school and education are associated to academic achievement. Understudies with helpless scholastic execution have a more hostile disposition towards learning and accept that school and learning would not assist them with being fruitful later on (Candeias, Rebelo & Oliveira, 2016).

A negative attitude towards learning is a contributing factor towards under- achievement. A defeatist mentality in education has caused a ton of dread and nervousness in learners who keep performing because they need revenue, interest, and persistence to learn and perform related undertakings. Further, the behavioral aspect of attitudes tends to react in a particular way to learning math. Emotional attitudes also influence behavioral attitudes. Students' confidence in Mathematics is associated with the success of Mathematics, which is considered positive behavior. If students are not confident in Math, they may fail, and bad behavior is harmful. Therefore, the behavioral component of attitude also affects the cognitive part of attitude. When students understand the importance of Mathematics in real life, they feel involved, confident, and connected in the learning process. Therefore, the three elements of attitude, self-confidence, the importance of Mathematics, and involvement are interrelated (Langat, 2015; Sanchal & Sharma, 2017).

Thus, it has been found that the surer young people's enthusiastic encounters and associations with school and instruction, the more predictable their inclinations to act following the requests, commitments, and requests of school, and the more the convictions, sentiments, positive musings, and thoughts regarding school. The better they do, the better their overall academic performance and their best results in subjects such as Mathematics (Veresova & Mala, 2016).

Attention not restricted to seeing approaching stimuli involves several processes, including filtering and balancing multiple perceptions and adding emotional meaning to these perceptions. There are two types of attention: passive and active. Passive attention alludes to the compulsory interaction set off by outside occasions withdrawing themselves from their environmental factors, like a splendid blaze of lightning, a solid smell, or an unexpected uproarious clamor. You could say that uninvolved

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attention is compulsory. On the other hand, active engagement is willful and guides by sharpness, center, interest, and needs like curiosity and hunger. Also, it includes effort (Thorne & Tomas, 2018).

Even though new and developing innovations offer extraordinary learning openings, a few inquiries regarding the effect of better approaches for getting data through the brain and mind. Numerous observers guarantee that Internet access contrarily affects the brain. Specifically, attention ensnares as an intellectual capacity that adversely influences the utilization of advanced technologies (Lodge & Harrison, 2019).

Most teachers face the reality every day that student's attention is wandering around the classroom. They are falling asleep, dozing, looking distractedly at some point other than the front of the room, texting, or accomplish something for another class. It is an issue that educators regularly discover hard to take on independently. Managing the enthusiastic response caused by absent- mindedness is more straightforward when it is all the more wholly comprehended (Weimer, 2015).

Hence, there are reasons to believe that the capacity to focus during lasting attention is harder for little youngsters than for more seasoned kids. Specifically, research shows that kids' affectability to commitment diminishes with age while concentration improves. Likewise, kids' capacity to utilize specific consideration strategies keeps on evolving during middle childhood. Thus, children can allocate their attention resources more efficiently and flexibly (Godwin & Fisher, 2017).

Alternatively, cognitive flexibility is perhaps the paramount quality that learners and instructors can create. Learning will be more accessible if children and their teachers can withstand change, open new experiences, solve problems creatively, and accept unexpected things. Developing flexibility is not always easy, but Lynn Cannon and a colleague in her book "Unstuck & On Target!" emphasized that it is also a skill that can teach explicitly (Konen, 2018).

Students need to think deftly and adjust to better approaches for learning and conveying in the period of fast instructive and innovative changes. Flexibility is one of the numerous abilities required for achievement in work, life, and learning in the 21st century. Regarding education, adaptable reasoning is a significant fitness to adjust to another learning climate, move information to new settings, and comprehend and tackle new issues (OECD, 2017; Spiro, Collins, & Ramchandran, 2015).

Moreover, ongoing examinations have proposed adjustments that require a more extensive idea of "flexibility" with accentuation on a more adaptable methodology. This methodology is pertinent to an innovation upgraded learning climate that is upheld or encouraged by web and portable advancements. In the field of current schooling, the need to reexamine "adaptable reasoning" is considering ongoing advances in data and communication innovations (Barak & Ziv, 2016).

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In the same way, flexibility can oversee and move between numerous portrayals of numbers and critical thinking procedures. Learners can utilize numerical adaptability to comprehend numerical ideas better and deliberately use techniques to discover mathematical questions. Furthermore, there are consistently a few different ways to tackle any issue. An essential part of fluency is knowing the facts and thinking about the most effective solution to a problem and choosing the best strategy to achieve that goal. Students are engaged in a process tailored to their abilities and experience absolute satisfaction from the constant effort, reflection, balancing this equation, and solving a problem. Such learned joy fulfills a craving for new and more troublesome things. When adaptable reasoning propensities start to create, they stretch out to different learning territories and lives (Dickinson, 2019; Wong, 2015).

Mathematics Achievement

There are essential components that learners should experience in a Mathematics program to accomplish the objectives of Mathematics schooling and embrace long-lasting learning in Mathematics. Learners must convey to learn and communicate their understanding, exhibit familiarity with mental Math and assessment, and create and apply new numerical information through problem-solving (Alberta Education, 2007).

Communication is a necessary piece of Math and arithmetic schooling. It is an approach to share thoughts and explain understanding and transforms ideas into objects for reflection, refinement, conversation, and change. The communication process also helps assemble importance and lastingness for views and makes them public (National Council of Teachers of Mathematics, 2015).

Communication is imperative to explain, support, and change thoughts, mentalities, and convictions about Mathematics. Learners ought to utilize various sorts of correspondence while learning. Learners likewise need to discuss their learning with the assistance of numerical wording. Learners need the chance to peruse, present, see, compose, tune in, and examine numerical thoughts. These changes permit them to make associations between their language and thoughts and the appropriate language and Mathematics images (British Columbia Ministry of Education, 2016).

Likewise, Merriam-Webster depicts communication as the interaction by which data trades between people through a typical arrangement of images, signals or practices. Therefore, numerical communication includes a broad scope of cognitive abilities. Since it is a trade of thoughts, it includes tuning in and perusing (understanding) just as talking and composing (expression). To some degree, extraordinary in Math, the term may incorporate the non-verbal introduction of Mathematical speculations (Sammons, 2018).

More so, the oral and composed communication and discourse of learners ought not to be disparaged. Communication and address in the classroom serve to accomplish three (3) common and interrelated objectives of learning, instructing, and evaluation. Learners convey their numerical reasoning and

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thinking, they become their eyewitnesses. They explain undetectable numerical arrangements and are more noticeable to themselves and their friends. Additionally, by clarifying their sense and how to tackle issues to their companions, they become instructors in the classroom and become surer about their capacity to finish significant Mathematical problems. In this sense, they have more prominent numerical abilities (Pourdavood & Wachira, 2015).

Seemingly, students' oral and written communication helps their classroom teachers understand the students' understanding. In this way, student interaction and classroom discourse improve student learning and help teachers make learning decisions. Communication and discourse in the classroom are powerful tools for teachers to assess student learning and create a safe environment for taking risks, exploring ideas, and honest conversations. Furthermore, it can involve parents in their children's education to strengthen the bond between the classroom teacher and the parent (Tsuruda, 2016).

In the same vein, Mathematics is considered a sign language for learners in conveying numerical and apply arithmetic productively. Communication assumes a significant part in making math meaningful. It permits learners to construct links between their intuitive and straightforward ideas and conceptual language and numerical imagery. It also assumes a significant part in assisting learners in making essential associations between the physical, pictorial, realistic, representative, phonetic, and otherworldly articulations of numerical thoughts. When learners comprehend that an expression, like a condition, can clarify numerous circumstances, they start to understand the force of Mathematics. They begin to learn the adaptability and convenience of Mathematics when they find that a few different ways of expressing an issue are more helpful than others (Kosko & Wilkins, 2017).

On the other hand, mental mathematics is a mix of intellectual procedures that energize adaptable reasoning and number sense. It tallies intellectually without the utilization of external memory helps. It permits learners to recognize answers without utilizing paper and pencil. It improves computational education by creating proficiency, exactness, and adaptability (National Council of Teachers of Mathematics, 2015).

Similarly, learners who specialize in mental mathematics will be liberated from depending on minicomputers, acquire trust in Math, turn out to be more adaptable scholars, and utilize numerous ways to deal with critical thinking. Mental Math is the foundation of all assessment cycles and offers a few elective calculations and non-standard procedures for discovering answers (Hope, 2015; Rubenstein, 2016).

Anent to this, Mental Mathematics ought to be underscored through the learner's instructive foundation due to its enduring impact. Mental math frequently views as a type of number juggling that does not utilize outer assets like paper, pencils, adding machines, and PCs, presenting learners to certifiable thoughts like assessments, monetary figuring, and surprisingly day by day necessities like groceries.

By investigating appropriate circumstances, learners acquire a superior comprehension of numbers and address assignments requiring these abilities (Manitoba Education, 2015).

It cannot be denied that when learners hear the words "mental math," they can convey a negative meaning that can prompt learners to disregard an essential tool outside of the classroom. While it is a more mainstream idea for more youthful age groups, mental arithmetic should focus on the auxiliary level. Mental arithmetic is not the procedural information behind plans and data, yet the genuine utilization of mathematics, number familiarity, and critical thinking abilities without ascertaining devices. The primary concern behind why learners need mental mathematics is that instructors do not have a legitimate comprehension of the significance of number sense and how it educates in the classroom. By zeroing in on repetition retention and underscoring math familiarity, learners will probably acquire a more profound comprehension of the estimation of mental arithmetic (Liu et al., 2015).

Additionally, one significant misconception is the connection between mental math and data recovery which is regularly called repetition memory. The thought behind mental number juggling is for learners to build up their procedures for taking care of a given issue and utilize various techniques to find a similar solution. Looking for data without outside assets does not use identical reasoning cycles since it is more situated than zeroed in on mathematical familiarity. To improve learners' comprehension of numbers, images, and other numerical assignments, they should concentrate on mental mathematics instead of repetition retention. Rather than estimating familiarity with speed, there are different criteria like adaptability, exactness, and critical thinking techniques (Heirdsfield, Cooper & Irons, 2015; Li, 2018).

Conversely, problem-solving is of particular significance in the investigation of mathematics. The fundamental goal of educating and learning math is to build up the capacity to settle a broad scope of complex numerical issues. The part of critical thinking in school mathematics has delineated the rich history of the subject. For some number-related educated individuals, Math is inseparable from critical thought—tackling word issues, making designs, deciphering shapes, creating mathematical developments, demonstrating hypotheses, and the like (Stanic & Kilpatrick, 2015).

Further, problem-solving learning should focus on mathematics at all evaluation levels. When learners face new circumstances and ask answers sorts of inquiries like "How are you?" or "How could you do that?", the critical thinking approach is being displayed. Learners create procedures to take care of their issues by tuning in, talking about, and attempting various techniques (Caine, 2016).

Also, in problem-solving activities, students need to figure out how to get what they want because they know it. If learners have effectively offer approaches to tackle the issue, the methods are not the issue, but practice. The genuine issue is that learners need to utilize the recently scholarly information in a

new manner and another unique situation. Critical thinking requires profound, calculated arrangement and learner's commitment (Armstrong, 2015).

To be good at solving mathematical problems, students need to develop basic mathematical knowledge. How effectively you organize this knowledge also contributes to successful problem resolution. Students with a good base of knowledge were the best at using heuristics in geometry instruction, with beginners paying attention to the surface characteristics of problems. At the same time, experts classified problems based on fundamental principles (Wilson, 2016).

Moreover, all individuals need to have critical thinking abilities to accomplish their ideal objectives throughout everyday life. Essential thinking skills become significantly more significant when economic arrangements expect to address the two issues of asset shortage and populace development. Practical critical thinking abilities with clear, monetarily feasible, ideal, and implementable structures are profoundly esteemed (Chaudhry & Rasool, 2017).

Hence, critical thinking is an incredible learning instrument that advances different, inventive, and imaginative arrangements. Establishing a climate wherein learners see and participate in finding an assortment of techniques for taking care of issues engages learners to investigate options and creates certain intellectual numerical risk-takers (Shaw & Cliatt, 2015).

Correlations between Measures

Learning behavior plays a significant part in the accomplishment of mathematics. The overall connection between learning behavior and achievement depends on the thought that the better the learning conduct a student has toward a subject or undertaking, the higher the degree of scientific accomplishment or execution (McLeod, 1992).

A proposition supports this hypothesis that learning attitudes and learning behaviors contribute to mathematics achievement in high school students. Further, students' learning behavior is equally important in determining student achievement in mathematics. It incorporates the learner's perspective, decisions, constancy, learning endeavors, and how the learner in question identifies with individuals who make up the school's local area and mastering abilities control by the student's learning conduct which impacts his learning design. Learning behavior refers to students' mental readiness for learning, which refers to their resource, creative thinking and creativity, love of learning, greater interest in reading and writing, and better mental coordination in the classroom and school (Akey, 2006; Rogel, 2012; Saxena, 2002).

Seemingly, mathematics achievement is not always a complete measure of a student's intelligence. Instead, different elements may influence the exhibition of the learner. Student learning behavior also plays an essential role in mathematics performance. It can affect the student's learning ability and the learning environment of other students (Singh, Granville & Dika, 2016).

Likewise, when students show a positive attitude towards mathematics, they achieve more, reflecting a significant relationship between learning behavior and educational performance. Conversely, negative attitudes towards mathematics are a contributing factor to the subject's weakening. It has caused a great deal of dread and tension in learners who reliably perform because they do not have the interest, curiosity, and tolerance needed to consider and finish subject-related undertakings in mathematics (Nicolaidou & Philippou, 2015).

Anent to this, learning behavior decides learners' capacity, readiness to learn, the decision of activity, and reaction to challenges. It sets the degree of responsibility, interest, individual exertion without which one can barely achieve. Hence, learning behavior affects students' level of confidence in mathematics and will later determine their success on the subject. Besides, learning behavior can be considered the least positive. The bright outlook towards learning arithmetic mirrors the positive, passionate inclination in this subject and the other way around. Hence, an uplifting mentality towards learning arithmetic is needed to influence the eagerness to learn and the advantages one can get from mathematics instruction (Zan & Martino, 2017).

Similarly, positive learning behavior was related to an expanded capacity and eagerness to finish class projects through the inspiration of learners and instructors. Such positive learning behavior, therefore, contributes to positive academic outcomes as it promotes academically-oriented behavior. Also, a study conducted on the effects of classroom behavior on perusing and math execution in first, third, and eighth grades and instructor insight on perusing and math execution in African Americans contrasted with white learners and men contrasted with young ladies. Learners showed that those who had advanced levels of positive learning had higher overall performance scores than students who had higher levels of negative learning behavior (Flynt, 2008; Waxman & Huang, 1997).

Consequently, several examines support how the achievement of learners in math relies upon the learning conduct of learners concerning the subject since this decides their capacity, want to learn, selection of activities, and reaction to challenges. It determines the degree of contribution, interest, personal impact, without which it is hard to work. Recent studies suggest a positive relationship between student learning behavior and math performance. Research reveals that students with positive learning behaviors do better. In an investigation created in the USA and Bielo Russian secondary school, learners featured the significance of learning behavior in numerical execution (Garden & Smith, 2015; Lipnevich et al., 2015).

Discoveries concerning the connection between math accomplishment and learning conduct are reliable, with research showing that successful people advance more surely in their learning conduct than low achievers. Action is, for the most part, identified with self-assurance inadequacy. Assertiveness identifies with mentalities toward math which recommends that when learners prevail

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at a numerical undertaking, it increments their feeling of fitness which may advance more good learning conduct (Mato & De la Torre, 2015; Peixoto & Almeida, 2016).

Affirmatively, in a study conducted in New Zealand, it was found out that the connection between math accomplishment and learning convictions and practices among young men and young ladies is predictable. Being interested and open to new difficulties in math and persisting when working through extreme issues are decidedly identified with math accomplishment. Homeroom practice that connects with learners' interests and builds up persistence can uphold math learning and execution (Whitney et al., 2015).

The above literature readings help focus the influence of learning behavior and mathematics achievement among generation Z learners. The literature presented also help the researcher realize that learning behavior has a significant influence on the mathematics achievement of Generation Z learners.

Theoretical Framework

The study is secured on the concept of McLeod (1992), whereupon expresses that learning behavior assumes a significant part in mathematics achievement. The overall connection between learning conduct and accomplishment depends on the idea that the better the learning conduct a student has towards a subject or assignment, the higher the accomplishment or execution level in Mathematics. This is supported by Rogel (2012) who proposed that students' learning conduct is a similarly significant factor in finding out the learners' mathematics accomplishment. It incorporates to learners' viewpoints, decisions, their ingenuity, endeavors in learning, and how the individual in question identifies with individuals that make up the school local area.

More so, Waxman and Huang (1997) claimed that positive learning practices had been related with an expanded capacity and readiness to finish homeroom projects through inspiration from both learners and instructors. Subsequently, these positive learning practices add to positive scholarly results since they advance scholastically arranged practices. Further, the independent variable is supported by a study conducted by Flynt (2008) on the impact of practices showed in the homeroom on perusing and math accomplishment in the first, third, and eighth grades learners. Instructional discernments on perusing and math accomplishment of African-Americans versus white learners and male versus female learners came about those who were appraised higher on positive learning practices had generally higher accomplishment scores than learners who were evaluated higher on negative learning practices.

Affirmatively, the dependent variable is supported by a study conducted by OECD (2013) in New Zealand. It was found out that the connection between math accomplishment and learning convictions and practices among young men and young ladies are reliable. Being interested and open to new difficulties in math and driving forward when working through intense issues are decidedly identified

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with math accomplishment. Homeroom practice that draws in learners' interest and builds up tirelessness can uphold math learning and execution.

Conceptual Framework

The conceptual framework is present in Figure 1. The independent variable is the learning behavior (McDermott et al., 2001) which is indicated by competence motivation, attitude towards learning, attention, and flexibility. In this study, competence motivation refers to the motivation to participate, persist, and work hard. Attitude towards learning means the ability and the willingness to learn. On the other hand, attention refers to effectively dealing with explicit data in the environment while blocking out other details. While, flexibility means the degree to which an individual can adapt to changes in conditions and consider issues and errands in novel, innovative ways.

Also, mathematics achievement (Alberta Education, 2007) is the dependent variable, which is measured by communication, mental Mathematics, and problem-solving. In this study, communication refers to making links between their language and thoughts and the conventional language and images of Mathematics. Mental Mathematics refers to figuring intellectually without the utilization of outside memory helps. Lastly, Problem-solving refers to deciding an approach to get based on what is known to what is looked for.

Significance of the Study

This study resonates on the academic field which will give an ample idea on the learning behavior of Generation Z, which may affect the cognitive engagement and scholarly accomplishment of learners in Mathematics. Further, conducting the correlational study can be significant and beneficial for some reasons. This may serve as a vehicle of the Department of Education in producing competent students that could bump into the changing world by understanding their learning behavior and initiate program that will answer the learning needs of today’s learners.

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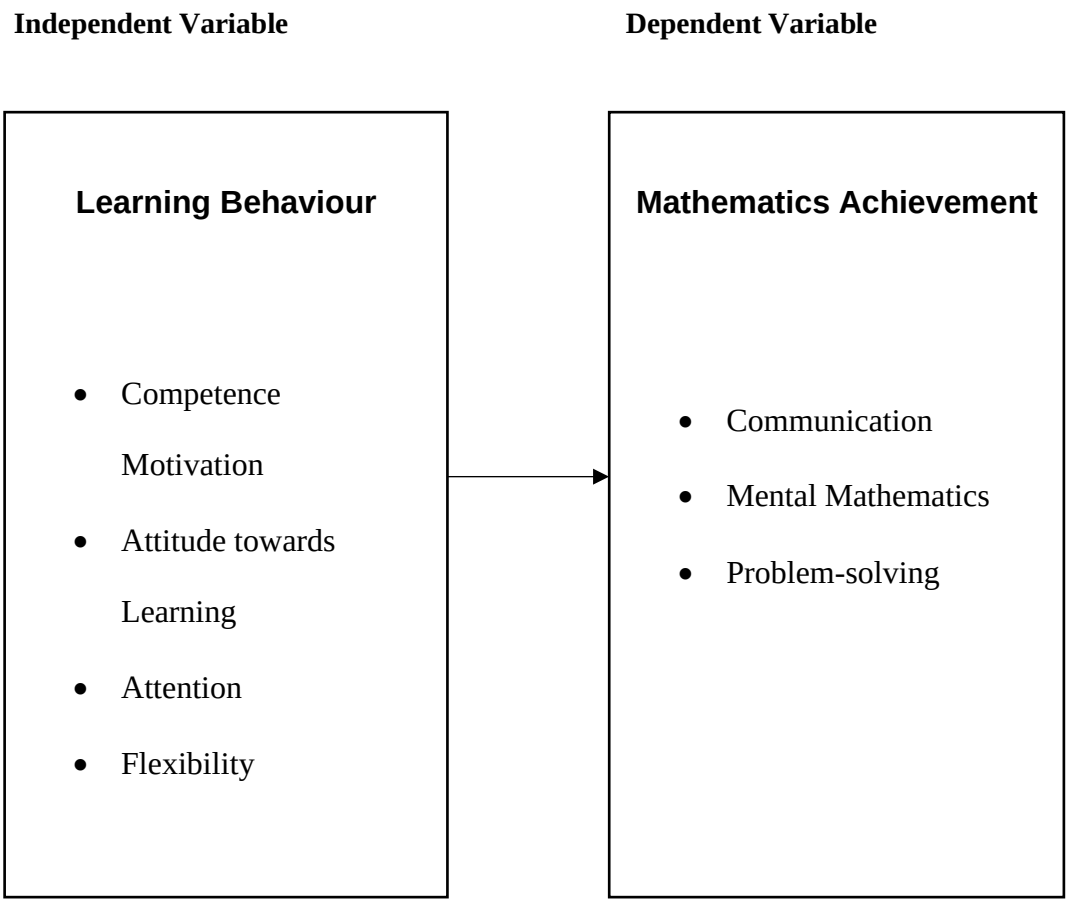

Figure 1. Conceptual Framework of the Study

Moreover, the teachers will be aware, thus allowing them to be more prepared in handling and addressing the needs of the students in Mathematics. Thus, the students at the said schools as the end of the study will have a gradual development not only in their behavior but also in their Mathematics achievement. Finally, this will help future researchers who wish to conduct a study and look on Generation Z learners' different perspectives.

Definition of Terms

For the reader to have a better understanding on the terminologies used in the study, the following terms are defined operationally.

Learning Behaviour. It refers to competence motivation, attitude towards learning, attention, and flexibility.

Mathematics Achievement. As used in this study, it refers to communication, mental mathematics, and problem-solving.

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Chapter 2

METHOD

In this chapter, the following salient features were presented in gathering the necessary data, research design, research locale, population and sample, research instrument, data collection, and statistical tool.

Research Design

This study utilized the quantitative, non-experimental design utilizing the causal effect procedure with regression analysis. Quantitative research arrangement is a formal, even-handed, exact technique wherein mathematical data is used to get information about the factors. It is used to describe variables or concepts, examine relationships among variables, and determine the effects of an intervention on an outcome. Correlational research is the best quantitative method of research in which you have two or more quantitative variables from the same group of subjects (Gay, Mills & Airasian, 2006).

This survey dealt with quantitative data about the said phenomenon. The quantitative angle was a suitable timetable for gathering the information intended for the respondents to address the inquiries. The focal point of the investigation was to decide the level of learning behavior and Mathematics achievement of Generation Z students of Mawab district.

Research Locale

The discoveries of this investigation were specified in the context of the four (4) secondary schools of Mawab District: Andili National High School, Lorenzo S. Sarmiento Sr. National High School, Nuevo Iloco National High School, and Tuboran National High School. The scope and the sample retracted the opportunities for the overall appropriateness of the discoveries.

The Philippines originally plotted at 125°56’E latitude and 730°’N longitude in the globe has its three wealthy archipelagoes, namely Luzon, Visayas, and Mindanao. Mindanao, where the towering valley of Davao de Oro historically originates, is fueled with eleven (11) Municipality. And one of the most progressive Municipalities is Mawab or Maa-wag.

Mawab composed of eleven (11) well-known barangays that are abundant with great agricultural and hand-made treasures. Starting with the scenic view Andili, the crafts of Bawani, the fruitful Concepcion, the crystal waters of Malinawon, the miniature mountains of Salvacion, the industrialized Poblacion, the biggest reservoir of Sao-sao, the pastries of Nuevo Iloco, the mining spot of Nueva Visayas, the Sawangan and the spring waters of Tuburan.

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Moreover, private and public schools, hospitals, and industries can usually be seen. Due to the vast population circling the vicinity and the industrialized buildings specialized in different fields, this gives the researcher a very good reason to seek a problem-solution scenario.

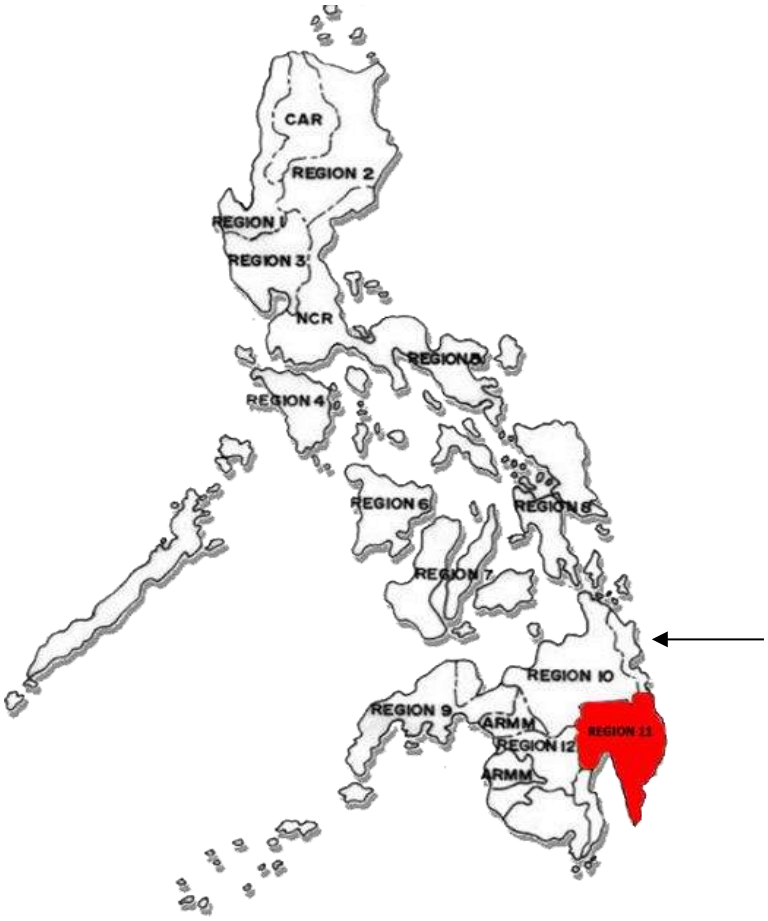

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Figure 2. Map of the Philippines Highlighting Mawab, Davao de Oro

Population and Sample

The subjects of this study were the generation Z learners of Mawab district. Generation Z refers to today's generation who were born between 1995-2012. The senior high school students of four (4) secondary schools of Mawab District: Andili National High School, Lorenzo S. Sarmiento Sr. National High School, Nuevo Iloco National High School, and Tuboran National High School were the target respondents of this study.

The respondents can withdraw anytime if they feel threatened with the conduct of the study. The study employed random sampling where each individual was chosen by chance, and each student had an equal opportunity to be included in the sample. This study was conducted in the school year 2020-2021.

Distribution of Respondents

Secondary Schools of Mawab District	Population	Sample
A	186	56
B	620	185
C	86	26
D	49	14
Total	**941**	**281**

Since it is impossible and impractical to survey every member of the population, Slovin's formula was used to get a sample that most represented the population being studied. A total of 941 students were considered respondents. The following shows the distribution of respondents.

Research Instrument

In this section, the researcher had sets of the questionnaire to collect and gather the relative data. The questionnaire as an inquiry instrument had been widely accepted as a functional and practicable method in gathering or collecting data to be able to answer the concerns in this investigation.

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The reason for this questionnaire was to inspect and test the degree of the validity of this correlational research. The research instrument in the study was adapted from the incorporated standard questionnaire of Learning Behavior Scale (McDermott et al., 2001) for the independent variable, and the questionnaire adapted from Levesque et al. (2017), which is the Grade 11 Essential Mathematics and Translating Word Problems (Stapel, 2019) for the dependent variable. However, these questions were modified for this study.

The first set of the questionnaire dealt with Learning Behavior with four (4) indicators: competence motivation, attitude towards learning, attention, and flexibility. The questionnaire was presented and validated to the group of experts for validation.

In evaluating the level of the Learning Behavior, the parameter of limits was as follows:

Range of Means	Descriptive Equivalent	Interpretation
4.20 – 5.00	Very High	This means that the learning behavior is very high.
3.40 – 4.19	High	This means that the learning behavior is high.
2.60 – 3.39	Moderate	This means that the learning behavior is moderately high.
1.80 – 2.59	Low	This means that the learning behavior is less high.
1.00 – 1.79	Very low	This means that the learning behavior is not high.

The second set of the instrument embarked with the Mathematics Achievement. It was composed of three (3) indicators such as communication, mental mathematics, and problem-solving. Each indicator had a 10-item question. In sum, 30-item questions were given to test the mathematics achievement of the students.

For the mathematics achievement, the following parameter of limits was as follows:

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Range of Scores	Descriptive Equivalent	Interpretation
24 – 30	Very High	This means that the mathematics achievement is excellent.
18 – 23	High	This means that the mathematics achievement is very satisfactory.
12 – 17	Moderate	This means that the mathematics achievement is satisfactory.
6 – 11	Low	This means that the mathematics achievement is moderate.
0 – 5	Very low	This means that the mathematics achievement is poor.

More so, for each indicator, the following five orderable degrees with their separate scope of scores and portrayals were thought of:

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Range of Scores	Descriptive Equivalent	Interpretation
8 – 10	Very High	This means that the mathematics achievement is excellent.
6 – 9	High	This means that the mathematics achievement is very satisfactory.
4 – 5	Moderate	This means that the mathematics achievement is satisfactory.
2 – 3	Low	This means that the mathematics achievement is moderate.
0 – 1	Very low	This means that the mathematics achievement is poor.

Data collection

The researcher was able to do the following procedures in collecting relevant data in this research's productivity.

Firstly, the researcher sought the securing approval to conduct the study from the Graduate School program chairperson and their recommendation. The letter of consent was sought from the Schools Division Superintendent, Public Schools District Supervisor, and the concerned School Administrators as permission to conduct the study. Upon accepting the letter, a letter of endorsement was sought in accommodating the researcher to administer the questionnaire on the identified respondents.

Further, before the survey questionnaire was handed out, the researcher sought the validation of questionnaires from competent internal and external evaluators. Then, the researcher's manuscript was reviewed by the UM Ethics Review Center. After which, it was pilot-tested for the assurance of its credibility. Next, the researcher explained to the respondents the means and importance of questionnaires and tool that was used were Facebook messenger, text messaging, and face-to-face communication provided that safety protocols were observed properly.

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Then, the questionnaires were handed out to the respondents via house-to- house visitation, if and only if their houses were reachable. For those who were not, questionnaires were handed out to the advisers and given to students upon distributing modules. Schools followed a weekly release and retrieval of modules.

Also, after the questionnaires were retrieved, it was disinfected and remained in a box for seven (7) days.

Finally, after the researcher retrieved the answered questionnaires, she immediately proceeded to the tallying and tabulating of collected data subjected to statistical analysis. Then, the statistics were analyzed and interpreted. With the data, conclusions were drawn out and recommendations were formulated given the discoveries of the exploration.

Statistical tools

The measurable instruments that were utilized for data analysis and interpretations are the following: Mean. This statistical tool was operated to decide the level of learning behavior and mathematics achievement of Generation Z learners.

Pearson (r). This statistical tool was employed to describe the significance on the relationship between the learning behavior and mathematics achievement of Generation Z learners.

Multiple Regression Analysis. This statistical tool was applied to discover the influence of learning behavior and mathematics achievement of Generation Z learners.

Ethical Consideration

Senior high school learners from the public schools of Mawab district were the main respondents of this study. To avoid the bias in the conduct of the study, random sampling was applied to seek the possible responses of all participants. Therefore, the researcher ensured their safety and gave full protection to not lose their trust. The researcher followed ethical standards in conducting this study. The researcher ensured the respondents' participation in this study was voluntary and made decisions from an informed position.

Voluntary participation refers to the exercise of volition in participation to an activity (Lavrakas, 2008). The students of senior high schools were given the choice to partake with no type of outcome, punishment or loss of advantages. The privileges of the respondents to the assemblage of information were painstakingly thought of and followed upon.

Privacy and confidentiality, in which, privacy requires respect and protects the research participants' right to self-determination and general welfare. While confidentiality means that the researcher will not discuss the research participant's information to others (Mayer, 2002). The analyst kept hidden

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and with most extreme secrecy the respondent's very own data needed in the examination. Informed consent process involves that researcher will give the participant adequate information, respond to the subject's questions, obtain the participants voluntary agreement and ensure that the participants have comprehended this information (Wiles, et.al., 2004). The researcher assured that the respondents of the study will express their volition and willingness to participate. And since the respondents are minors, a consent form was given prior to the conduct of survey as way of consoling their parent's approval in the study.

Recruitment refers to selecting suitable respondents for the study (Patel, Doku & Tennakon, 2003). Since the respondents are minors, the researcher was very sensitive unto their innocence thus, will set only a random sampling technique regardless of age, gender, religion, and race to be part of the study. Risks denote misconduct behavior, research data is falsified, damage to dignity, physical and image or innocence of the respondents (Baccarini & Melville, 2011). The study did not involve in high-risks situations that the respondents may experience in physical, psychological or social-economic concerns. The study just involved in the Generation Z learning behavior and mathematics achievement.

Benefit is the positive outcome or impact from the research to the respondents-participants, researcher, and contribution of research to knowledge, economy, society, and individuals of the study (Field & Berman, 2004). This study will benefit the Department of Education, Division of Compostela Valley, Mawab District, schools administrators, teachers, parents, and the students themselves where the study was conducted.

Plagiarism refers to the use of another person's ideas, processes, result, words without attribution or permission and presenting it as new or original (Ballyram, 2016). This study will have no touch or proof of distortion of another person's work. The researcher's manuscript will pass on a plagiarism check before and after its conduct.

Fabrication and Falsification mean the manipulating of research materials, processes, equipment, changing or omitting data and result without sound justification (Ballyram, 2016). This study will have no hint of deliberately distorting the work to fit a model or hypothetical assumption and have no proof of truly asserting or misrepresentation. Hence, the researcher's manuscript will pass through the validation of panel members.

Conflict of Interest (COI) is a condition in which the verdict about main interest is influenced by a secondary interest such as receiving a significant monetary reward from a certain industry (Caplan, 2007). This study had no trace of conflict of interest to protect the study from bias. The researcher ensured that the respondents involved in the study are not in consanguinity to establish fairness.

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Deceit refers to any action designed to mislead others by misinforming them so that they are manipulated to react in a certain manner (Tai, 2012). The study had no hint of misdirecting the respondents to any possible damage.

Authorship refers to substantial contribution of a researcher to the concept, attainment, examination, or elucidation of data (Ballyram, 2016). The analyst of the investigation is a degree holder of Bachelor of Secondary Education major in Mathematics and will undergo a series of revisions paper as per recommendation of the adviser and research assistant. The study adhered to the norms of the UM Tagum College Ethics Review Committee for the rules of moral thought.

Chapter 3

RESULTS

Results, analysis, and intervention drawn out from the conduct of the study are introduced in this part. The data presented both tabular and textual forms. All inferential results were analyzed and interpreted at 0.05 level of significance. Chronologically, tables and its interpretations are arranged in the subsequent subheadings: level of learning behavior, level of mathematics achievement, significance on the relationship between learning behavior and mathematics achievement, and the regression analysis on the influence of the domain of learning behavior to the mathematics achievement.

The standard deviation was used to determine the error on unknown samples. It cannot be noted that the standard deviation ranges from 0.58 – 0.71 which is lesser than 1.0 as the typical standard deviation for 5-points Likert scale (Wittink & Bayer, 1994). This means that the ratings in the accomplished questionnaires are closed to the mean, indicating the consistency of responses among the respondents.
Level of Learning Behavior

The mean scores for the indicators of learning behavior with a overall mean of 4.30 whereas described as very high with a standard deviation of 0.18 are appeared in Table 1. The very high level could be attributed to the very high rating given by the respondents in all indicators in terms of competence motivation, attitude towards learning, attention, and flexibility.

The cited total mean score was the outcome acquired from the subsequent computed mean scores from the highest to lowest indicators: 4.35 or very high for competence motivation with a standard deviation of 0.27; 4.32 or very high for attention with a standard deviation of 0.25; 4.32 or very high for flexibility with a standard deviation of 0.32; and 4.20 or very high for attitude towards learning with its corresponding standard deviation of 0.29.

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Table 1. Level of Learning Behavior

Indicator	Mean	SD	Descriptive Level
Competence Motivation	4.35	0.27	Very High
Attitude Towards Learning	4.20	0.29	Very High
Attention	4.32	0.25	Very High
Flexibility	4.32	0.32	Very High
Overall	4.30	0.18	Very High

The supreme mean score of 4.35 with a standard deviation of 0.27, which described as very high, was gained by competence motivation. The data indicated from appended Table 1.1 reveal that the respondents have observed the following order of importance: a mean of 4.47 with a standard deviation of 0.66, described as very high for focusing on the goal and driven to learn; a mean of 4.45 with a standard deviation of 0.56, described as very high for being determined to complete the task; a mean of 4.44 and a standard deviation of 0.55, described as very high for exerting effort in every performance; a mean of 4.29 with a standard deviation of 0.56, described as very high for responding appropriately when ask; and presenting answers and read it aloud attained a mean of 4.12 with a standard deviation of 0.55, described as high.

The second highest mean score was gained by attention with a mean of 4.32 and standard deviation of 0.25, described as very high. The data shown in appended Table 1.3 bring to light that the respondents have observed the following order of importance: a mean of 4.67 with a standard deviation of 0.53, described as very high for attending in class regularly; a mean of 4.32 with a standard deviation of 0.59, described as very high for interacting in class activities appropriately; a mean of 4.26 with a standard deviation of 0.62, described as very high for actively working with peers during class activities; staying on task with minimal distractions and not easily getting bored whenever we have our class discussion both described as high, attained a mean of 4.18 with a standard deviation of 0.53 and a mean of 4.17 with a standard deviation of 0.53, respectively.

Similarly, flexibility also got a mean score of 4.32 with a standard deviation of 0.32, described as very high. The data stipulated in appended Table 1.4 unveil the following order of importance observed by the respondents: a mean of 4.54 with a standard deviation of 0.51, labelled as very high for taking responsibility for my learning experiences; a mean of 4.37 with a standard deviation of 0.62, defined as very high for being able to enjoy finding information about new topics on my own; a mean of 4.30 with a standard deviation of 0.54, designated as very high for being open to new ways of doing familiar things; a mean of 4.27 with a standard deviation of 0.59, described as very high for trying to stick with the task given to

me even when it is difficult; and working on my own happily, pronounced as high, attained a mean of 4.14 and a standard deviation of 0.66.

The lowest mean score of 4.20 with a standard deviation of 0.29, described as very high, was acquired by attitude towards learning. The data presented in appended Table 1.2 unmask that the respondents have observed the following order of importance: a mean of 4.52 with a standard deviation of 0.58, defined as very high for accepting help when a task is too challenging; a mean of 4.33 with a standard deviation of 0.65, labelled as very high for working best in solving mathematical problems with peers; a mean of 4.20 with a standard deviation of 0.57, designated as very high for getting a great deal of satisfaction out of solving mathematics problem; being confident when it comes to solving mathematics problems and solving mathematics problems without too much difficulty, both described as high, reaped a mean of 4.11 with a standard deviation of 0.61 and a mean of 3.87 with a standard deviation of 0.69, respectively.

Level of Mathematics Achievement

Presented in the Table 2 are the mean scores for the indicators of mathematics achievement with a total mean score of 22.27 whereas described as high with a standard deviation of 0.86. The high level could be attributed to the high rating given by the respondents on most indicators in the items of communication, mental mathematics, and problem solving.

The cited total mean score was the result gained from the subsequent computed mean scores from highest to lowest indicator: 7.55 or high for communication with its standard deviation of 0.60; 37.48 or high for mental mathematics with its standard deviation of 0.50; and 7.24 or high for problem solving with its corresponding standard deviation of 0.57.

Table 2. Level of Mathematics Achievement

Indicator	Mean	SD	Descriptive Level
Communication	7.55	0.60	High
Mental Mathematics	7.48	0.50	High
Problem Solving	7.24	0.57	High
Total	22.27	0.86	High

Significance of the Relationship between Levels of Learning Behavior and Mathematics Achievement

Relatively, determining whether the learning behavior have significant relationship with the mathematics achievement is one of the objectives of this study. After that, Pearson r was utilized to

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govern the correlation between two variables. More so, presented in Table 3 is the analyzed and interpreted results.

The gathered outcomes exposed that all the indicators of learning behavior such as competence motivation, attitude towards learning, attention, and flexibility are significantly related to mathematics achievement. The R-value for competence motivation is 0.618* with a p-value of 0.001 and a coefficient of determination of 0.3819, shows a positive correlation. Next, attitude towards learning, has an R- value of 0.417* with a p-value of 0.001 and a coefficient of determination of 0.1739, shows a positive correlation. Third is attention which has an R-value of 0.463* with a p-value of 0.001 and a coefficient of determination of 0.2144, shows a positive correlation. Last indicator is flexibility that has an R-value of 0.397*, a p-value of 0.001 and a coefficient of determination of 0.1576, also shows a positive correlation.

Table 3. Significance of the Relationship between Levels of Learning Behavior and Mathematics Achievement

Independent Variables	Dependent Variable	r-value	r-squared	p-value	Decision
Competence Motivation	Mathematics Achievement	0.618*	0.3819	0.001	H_o is rejected
Attitude Towards Learning		0.417*	0.1739	0.001	H_o is rejected
Attention		0.463*	0.2144	0.001	H_o is rejected
Flexibility		0.397*	0.1576	0.001	H_o is rejected

*Significant at 0.05 level of significance.

The table above shows that competence motivation has the most significant relationship with the R-value of 0.618*, followed by attention with 0.463*, next is attitude towards learning with 0.417*, and flexibility with 0.397*. Thus, the interdependence of the variables shows that competence motivation, attitude towards learning, attention, and flexibility have significant relationship to the mathematics achievement.

Furthermore, as presented in the table, the first hypothesis, which states that there is no significant relationship between learning behavior and mathematics achievement of generation Z learners is also rejected.

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Regression Analysis on the Influence of Learning Behavior and Mathematics Achievement

Presented in Table 4 is the regression analysis on the influence of learning behavior and mathematics achievement. The table shows a computed F-ratio of 92.161 and p-value of 0.001, which means that there is a significant influence between learning behavior and mathematics achievement. The R-value of 0.744 indicating a positive relationship between learning behavior and mathematics achievement. The overall R2 is 0.554 indicating that 55.4% of the level of learning behavior is explained by competence motivation, attitude towards learning, attention, and flexibility and the remaining percentage is accountable to the other indicators not included in the study.

Table 4. Regression Analysis on the Influence of Generation Z Learning Behavior and Mathematics Achievement

Independent Variable	Unstandardized Coefficients		Standardized Coefficients Beta	t-value	p-value	Decision
	B	SE				
(constant)	7.569	0.795				
Competence Motivation	1.392	0.137	0.443*	10.185	0.001	H_o rejected
Attitude Towards Learning	0.583	0.127	0.194*	4.577	0.001	H_o rejected
Attention	0.892	0.150	0.256*	5.958	0.001	H_o rejected
Flexibility	0.541	0.113	0.202*	4.784	0.001	H_o rejected

Dependent Variable: Mathematics Achievement

$R = 0.744^*$ $R^2 = 0.554$

F-ratio = 92.161 P-value = 0.001

Moreover, competence motivation has beta of 0.443* with a p-value of 0.001; attitude towards learning has a beta of 0.194*, a p-value of 0.001; attention has a beta of 0.256*, p-value of 0.001; and flexibility has a beta of 0.202* with a p- value of 0.001. All indicators of the independent variable have correspondingly 0.001 p-value which is lesser than 0.05 level of significance. Hence, competence motivation, attitude towards learning, attention, and flexibility significantly influence Generation Z learners' prediction of mathematics achievement. More so, competence motivation is the domain that best influence the mathematics achievement of Generation Z learners.

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Therefore, as presented in the table, the second hypothesis that states that there is no domain in the learning behavior that significantly predicts the generation Z learners' mathematics achievement is rejected on all indicators: competence motivation, attitude towards learning, attention, and flexibility.

DISCUSSION

The data obtained on the learning behavior and mathematics achievement of generation Z learners are presented in this chapter and said further discussions are based on the findings showed in the previous section.

Level of Learning Behavior

In the previous chapter, it was found out that the degree of learning behavior of the four secondary institutions of Mawab district in the division of Davao de Oro was very high. This is because of the very high-level rating assumed by the respondents in terms of competence motivation, attitude towards learning, attention, and flexibility, which means that the learning behavior of generation Z learners was very much high. Specifically, the learning behavior of in terms of competence motivation was very much high. It means that the students were highly motivated to participate, to persist and to work hard.

More so, it was presented in the studies of Dornyei (2015) and Slavin (2017) that motivation is an essential formula for academic achievement. It incorporates interior and exterior factors that invigorate the wants and energy in individuals and a constant interest in a task, role, or subject, and the achievement of a permanent goal. One study contended that inspiration discloses why individuals choose to accomplish something, how hard they will seek after, and how long they have been willing to do it. All in all, motivation is the thing that makes you go, makes all the difference for you, and figures out where you are attempting to go.

This is congruent to the study of McCrindle (2019) which states that younger generation today yearns and thrives recognition of their efforts. Understandably, youngsters have experienced childhood in a steady well-being net at home, in the society, and all through their schooling. As a result, they react to encourage feedback and proceed and additionally improve their behavior.

Moreover, learning behavior in terms of attention was also very much high, this means that the students are very active and properly interact with class activities. It was presented in the study conducted by Thorne and Romas (2018) that it is something other than seeing approaching improvements. It includes various cycles including sifting through discernments, adjusting numerous insights, and connecting passionate importance to these insights. It is deliberate and is guided by readiness, fixation, and premium needs like curiosity.

Additionally, as stated, and parallel to the study of Spiro, Collins and Ramchandran (2015), learning behavior in terms of flexibility was also very much high, which means that can adapt to changes in

conditions and consider issues and errands in a novel, imaginative ways. It is one of numerous abilities essential for accomplishing work, life, and learning in the 21st century. Regarding schooling, adaptable reasoning is a key competency vital for adjusting to new learning conditions, moving information to new circumstances, and comprehending and taking care of new issues. In quick instructive and innovative changes, students needed to think deftly and adjust to better approaches for learning and conveying.

Likewise, Dickinson (2019) stated that there is in every case more than one approach to tackle each issue. A critical piece of familiarity is not simply knowing a reality yet additionally realizing how to consider tackling an issue most proficiently and picking the best technique to arrive. Learners will connect profoundly such that accommodates their ability and experience the true fulfillment which comes from making a decent attempt, sorting things out, adjusting to that condition perfectly, and taking care of an issue. That sort of scholarly fulfillment makes a craving for attempting new and additional difficult things. When propensities for adaptable intuition begin to incubate, they can be summed up to different zones of learning and life.

In addition, in the study conducted and consonance to the studies of Keser (2015) and Mullis and Martin (2017), learning behavior of attitude towards learning was very much high, which means that students have the ability and willingness to learn. It is an important factor on the students' degrees of objective setting, critical thinking capacities, their convictions towards learning, their internal and outside inspirations during the time spent learning and every one of the educational exhibitions they perform. It has been seen that planned designers and specialized instructors have uplifting attitudes towards learning. Hence, improving learners' perspectives toward learning is a significant curricular objective for some nations.

Subsequently, the Ministry of Education (2016) argued that disposition could change each part of an individual's life including their schooling. Learners’ mentalities on learning decide their capacity and readiness to learn. If negative perspectives are not adjusted, a learner will probably not proceed with his schooling beyond what is required. Changing learners' negative mentalities towards learning is a cycle that includes deciding the elements driving the demeanor and utilizing this data to achieve change.

Level of Mathematics Achievement

The previous chapter revealed the level of mathematics achievement in the four (4) secondary schools in Mawab District of the Division of Davao de Oro was high. This is because the high-level rating assumed by the respondents in communication, mental mathematics, and problem-solving means that the level of mathematics achievement was very satisfactory. Following the study presented by the Alberta Education (2007), there are critical components such as communication, mental mathematics, and problem solving that learner should experience in a Mathematics program to accomplish the objectives of Mathematics training and embrace long-lasting learning in Mathematics.

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Mathematics achievement in terms of communication was very satisfactory. Parallel to the study directed by the British Columbia Ministry of Education (2016), communication is significant in explaining, building up and adjusting thoughts, mentalities, and convictions about Mathematics. Learners ought to be urged to utilize an assortment of types of correspondence while learning Mathematics. They likewise need to convey their picking up utilizing numerical phrasing. They need freedoms to find out about, address, see, expound on, tune in to and examine numerical thoughts. These chances permit understudies to make joins between their language and thoughts and the conventional language and images of Mathematics.

Anent to this, Kosko and Wilkins (2017) also stated in their study that communication assumes an imperative part in making mathematics significant; it empowers learners to build links between their casual, instinctive ideas and the theoretical language and imagery of math. It also assumes a vital part in assisting learners with making basic associations among physical, pictorial, realistic, emblematic, verbal, and mental portrayals of numerical thoughts.

Seemingly, the mathematics achievement in terms of mental mathematics was also very satisfactory. It was revealed in the study conducted by the National Council of Teachers (2015) that mental Mathematics is a mix of psychological techniques that upgrade adaptable reasoning and number sense. It is ascertaining intellectually without the utilization of outer memory helps. It empowers learners to decide answers without paper and pencil. It improves computational familiarity by creating productivity, exactness, and adaptability.

Manitoba Education (2015) suggested that mental mathematics ought to be underscored all through a learner's instructive vocation on account of its durable effect. Frequently, mental calculation is viewed as a type of math computation without outer assets like paper, pencil, number crunchers, and PCs. Learners are exposed to true thoughts like assessment, monetary estimations, and in any event, buying day by day things like staple goods. By investigating appropriate circumstances, learners are bound to acquire a superior comprehension of numbers and how to settle undertakings requiring these abilities. Moreover, in the study conducted and according to the study of Stanic and Kilpatrick (2015), mathematics achievement in terms of problem solving, was also very satisfactory. Problem-solving has an extraordinary significance in the investigation of math. An essential objective of math instruction is to build up the capacity to tackle a wide assortment of complex mathematical issues. The job of critical thinking in school has shown a rich history of the point. To numerous numerically educated individuals, mathematics is inseparable from tackling issues, doing word issues, making designs, deciphering figures, creating mathematical developments, demonstrating hypotheses, and so on.

Hence, Shaw and Cliatt (2015) stated that problem-solving is an amazing instructing apparatus that encourages various, inventive, and imaginative arrangements. Establishing an environment where learners straightforwardly search for, and participate in, discovering an assortment of procedures for

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tackling issues enables learners to investigate choices and creates sure, intellectual numerical daring individuals.

Significance of the Relationship between Levels of Learning Behavior and Mathematics Achievement

The present study discloses a significant relationship between learning behavior and mathematics achievement of generation Z. This confirms the concept of McLeod (1992), which stated that learning behavior assumes a significant part in Mathematics achievement. The connection between learning conduct and accomplishment depends on the idea that the better the learning conduct a student has towards a subject or undertaking, the higher the accomplishment or execution level in Mathematics. This idea has been steady with the discoveries of the current study. This is also related to the proposition of Rogel (2012) who said that student's learning behavior is a similarly significant factor in finding out the Mathematics accomplishment of the learners. It incorporates learner's viewpoint, decision, perseverance, endeavors in learning and how the individual in question identifies with individuals who make up the school local area.

The relationship between the overall learning behavior and mathematics achievement is significant. This implies that Generation Z learners' mathematics achievement is predicted or dependent to their respective learning behavior. These findings affirmed the study of Waxman and Huang (1997), which claimed that positive learning behaviors have been related to an expanded capacity and eagerness to finish classroom projects through inspiration from both learners and educators. Hence, these positive learning practices add to the positive academic results since they advance scholastically arranged practices. This also conforms with the study conducted by Flynt, (2008), which stated that learners who were evaluated higher on positive learning behaviors had, by and large, higher accomplishment scores than understudies who were appraised higher on negative learning behaviors.

Regression Analysis on the Influence of Learning Behavior and Mathematics Achievement

The regression analysis on the influence that significantly predicts learning behavior on mathematics achievement showed that all the domains such as competence motivation, attitude towards learning, attention, and flexibility significantly influenced most to the mathematics achievement.

The result showed that competence motivation significantly influences the mathematics achievement. This is in line with Urdan (2015), who claimed that competence motivation includes a worry with authority. The intention, or the impulse for activity a particular way, is to create, to accomplish, or to show ability. It invigorates want and energy in learners to be ceaselessly intrigued and submitted in accomplishing the objectives of Mathematics.

Moreover, the result revealed that attitude towards learning significantly influences the mathematics achievement. This is parallel to the study conducted by Candeias, Rebelo and Oliveria (2016), which stated that attitudes towards school and learning are related to educational accomplishment. It decides

the learners' capacity and eagerness to learn. Thus, learners with great scholarly execution have a more uplifting disposition towards learning.

Further, the result presented that attention significantly influences the mathematics achievement. This is congruent to the study of Thorne and Tomas (2018), which argued that attention includes various cycles including sifting through insights, adjusting numerous discernments, and joining enthusiastic importance to these discernments. Thus, having active attention will help the students to be alert, to concentrate, and to have interest in learning.

Lastly, flexibility significantly influences the mathematics achievement. This aligns with the study presented by Wong (2015), which affirmed that flexibility is the capacity to keep up and move among various portrayals of numbers and between critical thinking techniques in a versatile way. Thus, learners will better comprehend numerical ideas and more adaptively use procedures to discover answers for mathematical questions.

CONCLUSION

Considering the discoveries of the investigation, conclusions are attracted this segment. The level of learning behavior is very high for competence motivation, attitude towards learning, attention, and flexibility and the overall mean of very high for learning behavior of generation Z learners. This simply means that the different learning behavior were very much high in the four (4) secondary schools of Mawab district. The level of mathematics achievement is high for communication, mental mathematics, and problem-solving, and the overall mean of high for the level of mathematics achievement. This means the various mathematics achievement were very satisfactory in the four (4) secondary schools of Mawab District.

There is a significant relationship between learning behavior and mathematics achievement of generation Z. This implies that learning behavior in terms of competence motivation, attitude towards learning, attention and flexibility significantly influence mathematics achievement. This is associated with the concept of McLeod (1992), which stated that learning behavior assumes a significant part in Mathematics accomplishment. Consequently, the better the learning conduct a student has towards a subject or undertaking, the higher the accomplishment or execution level in Mathematics.

RECOMMENDATIONS

On the bright side of the preceding and conclusion, the following recommendations are offered: Department of Education may initiate programs that will answer the learning needs of today’s learners, a program that will help in understanding their learning behavior and improving their mathematics achievement.

Second, school administrators must involve their teachers in seminars that may help them with molding of today's learners. More so, since problem-solving attained the least mean score in mathematics

achievement, they may recommend seminars and training on problem-solving in Mathematics that will help in developing creative, critical, and logical thinking skills.

Third, teachers must continue handling and addressing the needs of the students in Mathematics. As such, teachers must have differentiated instruction considering the students' learning behavior. Also, teachers must give activities such as analysis, creativity, decision making, and logical reasoning such as "Wool Webs", "To Do Scavenger Hunt", "Impromptu Skits", "Block Duplicating", "Tower Building", "Personalized Crossword", and the like. These will help the students in honing their problem-solving skills.

Fourth, the students must involve themselves through understanding and developing their learning behavior and mathematics achievement, thus, they will become competent students who could bump into the changing world.

Lastly, future researchers may provide a starting point on expanding the coverage of the research in terms of the variables covered in the study. They can include other indicators that are possible factors of the students' behavior aside from the indicators mentioned and presented in this study.

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APPROVAL SHEET

This thesis entitled "**LEARNING BEHAVIOUR AS PREDICTOR OF MATHEMATICS ACHIEVEMENT AMONG GENERATION Z LEARNERS**" prepared and submitted by **ANNA MARIE ORBETA PELANDAS**, in partial fulfillment of the requirements for the degree, **Master of Arts in Education Major in Teaching Mathematics**, has been examined and is thus recommended for approval and acceptance.

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Adviser

PANEL OF EXAMINERS

APPROVED by the Panel of Examiners on Oral Examination with a grade of ***PASSED***.

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DEDICATION

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